

A Place Worth Protecting: Rethinking Cost-Benefit Analysis Under FEMA’s Flood-Mitigation Programs

Kelly McGee[†]

As climate change threatens coastal areas with more frequent and intense flooding, the federal government has adopted a greater focus on mitigating the effects of natural disasters. While neighborhoods differ in terms of physical risk exposure, they also differ in social vulnerability—the characteristics that influence a community’s ability to safely weather a storm, withstand disruptions to employment and housing, navigate the rebuilding process, and eventually return to normal. Funding for federal flood-mitigation projects administered by the Federal Emergency Management Agency (FEMA) is currently distributed according to a simple metric—the benefits of a project must outweigh its costs. FEMA’s approach to cost-benefit analysis (CBA), however, primarily measures physical risk to property while neglecting the long-term, intangible social costs incurred by vulnerable communities. This approach has resulted in higher-property-value communities receiving a disproportionate share of mitigation infrastructure, while lower-income communities are either left without protection or relocated. The distribution of mitigation funding therefore plays a role in exacerbating place-based inequality.

This Comment proposes ways in which FEMA could better account for the distributional effects of its projects and promote efficient policies that take into account the full range of social and economic costs associated with natural disasters. It begins by detailing how FEMA neglects to consider distributional outcomes in its mitigation programs, consistent with the single-minded focus on economic efficiency prevalent in federal regulatory decision-making. Next, it surveys empirical research documenting the ways in which FEMA’s use of CBA exacerbates wealth inequality and social vulnerability to flooding. The Comment then considers various legal avenues for redressing the disparate impacts resulting from FEMA’s policies, concluding that none are likely to be successful. Instead, it offers five policy adjustments that FEMA could implement in its cost-benefit methodology to ensure that resources for flood mitigation are more equitably distributed, emphasizing ways in which these better accord with the agency’s own focus on economic efficiency.

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[†] B.A. 2017, Harvard University; J.D. Candidate 2022, The University of Chicago Law School. Many thanks to Professor Lee Anne Fennell, Professor Jennifer Nou, Professor Mark Templeton, Phillip Kash, and the editors of the *University of Chicago Law Review* for their helpful conversations and insight.

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INTRODUCTION

In August 2017, Hurricane Harvey hit Harris County, Texas, causing \$125 billion in damages and flooding 150,000 homes.¹ Harvey was the most intense hurricane ever recorded in U.S. history in terms of duration and peak rainfall and the deadliest hurricane to hit Texas in almost a century.² More than four years later, the recovery process continues, including efforts to mitigate the impacts of future disasters.

After Hurricane Harvey, the Harris County judge and commissioners called for a special election to issue \$2.5 billion in bonds to finance flood-damage-reduction projects.³ In 2018, the

¹ JIM BLACKBURN & PHILIP B. BEDIANT, JAMES A. BAKER III INST. FOR PUB. POL'Y OF RICE UNIV., HOUSTON A YEAR AFTER HARVEY: WHERE WE ARE AND WHERE WE NEED TO BE 3 (2018).

² *Fast Facts: Hurricane Costs*, OFF. FOR COASTAL MGMT., <https://perma.cc/7A7K-ZWJK>.

³ BLACKBURN & BEDIANT, *supra* note 1, at 3. The Commissioners Court, headed by the county judge, is the governing body of Harris County and oversees the Harris County

measure passed. Citing a provision in the bond measure that required the creation of “a process for the equitable expenditure of Bond Program funds,” the court adopted a new framework for deciding which projects would be completed first.⁴ Rather than simply prioritizing projects that protected the highest-value property, as the county had historically done, the county now scored projects across several criteria, measuring existing conditions, expected risk reduction, cost, availability of funding, and environmental and recreational benefits.⁵ Most controversially, the county also weighed the social vulnerability of the neighborhood where a project was to be built as 20% of the project score.⁶ This social vulnerability factor incorporated demographic characteristics “that influence a community’s ability to prepare for, respond to, and recover from a disaster.”⁷

The inclusion of the Social Vulnerability Index (SVI) in the prioritization framework quickly generated debate. Advocates applauded the change as necessary to redress a long history of federal flood funds being directed toward wealthier neighborhoods.⁸ Under the new method, projects proposed in neighborhoods with more socially vulnerable residents would likely move up the priority list. Conversely, the new prioritization framework engendered harsh criticism from upper-income communities whose

Flood Control District, among other duties. *See About: Judge Lina Hidalgo*, LINA HIDALGO, HARRIS CNTY. JUDGE, <https://perma.cc/GAH3-KL53>. Flood-damage-reduction projects authorized by the bond measure include “purchasing lands, easements, rights-of-way and structures, and [] the acquisition and construction of improvements, including detention basins, channel modifications and other works suitable for use in connection with flood damage reduction.” HARRIS CNTY., TEX., BUDGET MGMT. DEP’T, ORDER CALLING HARRIS COUNTY FLOOD CONTROL DISTRICT BOND ELECTION, PROPOSITION A (2018).

⁴ LINA HIDALGO, HARRIS CNTY. COMM’RS CT., PROPOSED AGENDA ITEM AND ATTACHED RESOLUTION (2019).

⁵ *See* HARRIS CNTY. FLOOD CONTROL DIST., FINAL PRIORITIZATION FRAMEWORK FOR THE IMPLEMENTATION OF THE HARRIS COUNTY FLOOD CONTROL DISTRICT 2018 BOND PROJECTS 2 (2019).

⁶ *See id.* at 6.

⁷ *Id.* at 4. To measure social vulnerability, Harris County adopted the Social Vulnerability Index (SVI) developed by the CDC, which incorporates fifteen Census variables such as “percentage of elderly residents, limited English proficiency, [and] households without a vehicle.” *Id.*; *see also* CTRS. FOR DISEASE CONTROL & PREVENTION, CDC SOCIAL VULNERABILITY INDEX (CDC SVI), <https://perma.cc/8MDQ-KLYA>.

⁸ *See* Christopher Flavelle, *A Climate Plan in Texas Focuses on Minorities. Not Everyone Likes It.*, N.Y. TIMES (July 24, 2020), <https://perma.cc/GCG2-59DM>. The bond measure recognized that project selection “may have been affected in the past and may continue to be affected by eligibility requirements for matching Federal, State, and other local government funds” and permitted the Court “to expend proceeds of the Bonds without regard to the eligibility requirements for matching federal, state and other local funds.” HARRIS CNTY., TEX., BUDGET MGMT. DEP’T, *supra* note 3, § 14(g)–(h).

projects were bumped down in priority. These opponents saw the SVI as improperly grafting socioeconomic concerns onto what was essentially an engineering problem or as an effort by elected officials to co-opt tax dollars to win over lower-income constituencies.⁹

The debate underway in Houston is likely to crop up throughout the country as rising sea levels threaten a greater number of communities due to climate change. Economic losses from storm-related wind and flooding are expected to total \$54 billion per year under current conditions, with an annual cost of \$17 billion to the federal government.¹⁰ And with this increase in risk, inequalities in vulnerability to extreme flooding that are tied to historic patterns of disinvestment and segregation will inevitably be exposed.

These inequities have been created in part by the federal government's practice of funding flood-mitigation projects on the basis of cost-benefit analysis (CBA).¹¹ The Federal Emergency Management Agency (FEMA), for instance, requires that projects funded through its hazard-mitigation programs produce benefits outweighing the costs.¹² The agency's methodology for calculating costs and benefits captures direct loss of property and life, but it is less successful at estimating the indirect burdens that natural disasters impose on vulnerable communities and the government. Following the agency's methodology, the value of property and other benefits protected by a sea wall, drainage project, or other flood-prevention mechanism must be greater than the cost to construct such infrastructure.¹³ Under this system, areas with lower property values are less likely to qualify for projects that are similarly priced to those built in high-property-value areas.¹⁴ For example, a \$5 million seawall or drainage channel would satisfy CBA if it protected ten \$500,000 homes but not if it protected forty-nine \$100,000 homes. This practice leads to disparate results when storms hit. Greens Bayou—one of Harris County's

⁹ See Flavelle, *supra* note 8.

¹⁰ CONG. BUDGET OFF., EXPECTED COSTS OF DAMAGE FROM HURRICANE WINDS AND STORM-RELATED FLOODING 1, 4, 8 (2019).

¹¹ For an overview of the role that CBA plays in regulatory review, see generally Daniel H. Cole, *'Best Practice' Standards for Regulatory Benefit-Cost Analysis*, 23 RSCH. IN L. & ECON. 1 (2007).

¹² See FEMA, HAZARD MITIGATION ASSISTANCE GUIDANCE: HAZARD MITIGATION GRANT PROGRAM, PRE-DISASTER MITIGATION PROGRAM, AND FLOOD MITIGATION ASSISTANCE PROGRAM 21 (2015).

¹³ See BLACKBURN & BEDIENT, *supra* note 1, at 31.

¹⁴ See *id.*

poorest areas and also one of the most impacted by Harvey—had previously struggled to qualify for federal funding that might have reduced the amount of damage it experienced.¹⁵ While some state and local governments may adopt alternative metrics to distribute local funding as Harris County did, federal mitigation funding—an essential lifeline for many communities—comes with the cost-benefit string attached.

This Comment examines how FEMA’s use of CBA to evaluate flood-mitigation projects results in the disproportionate protection of neighborhoods with higher property values—values that are themselves a product of past infrastructure investment. By conceptualizing risk primarily in terms of property damage rather than social vulnerability, FEMA fails to account for many of the long-term costs of flooding to communities that are left unprotected. These include unemployment, homelessness, and harms to health that result when vulnerable communities are displaced from their homes or forced to live in unsafe conditions. This Comment argues that FEMA can better advance the goal of economic efficiency by incorporating the full long-term costs of flooding to vulnerable populations in its cost-benefit methodology. What’s more, paying greater attention to the distributional impacts of its policies will allow FEMA to uphold the distributional mandate long espoused—but never fulfilled—by past administrations conducting regulatory review.¹⁶

Part I first contextualizes FEMA’s approach within the broader regulatory environment, highlighting how the federal government has neglected distributional considerations in favor of economic efficiency. Second, it argues that applying CBA to unequal distributions of wealth can entrench inequality. Part II then details the CBA methodology FEMA uses to award Hazard Mitigation Assistance (HMA) grants that help communities lessen the effects of future disasters. As currently conducted, this methodology emphasizes physical risk while failing to account for the disproportionately harmful impacts that natural disasters have on low-income, minority, and otherwise socially vulnerable communities. By failing to incorporate long-term social impacts like homelessness, unemployment, or health-care costs that result when communities with the fewest resources to recover go

¹⁵ See *id.* Because Harris County raised the funds through a bond measure, it could adopt its own criteria and was not subject to the federal government’s CBA. HARRIS CNTY., TEX., BUDGET MGMT. DEP’T, *supra* note 3, § 14(h).

¹⁶ See *infra* text accompanying notes 24–28.

unprotected, FEMA's approach may actually fail to promote cost-efficient investments. Further, allocating scarce government resources to those who already have the resources to easily recover from natural disasters may widen the wealth gap and increase disparities in vulnerability to future flooding. To provide empirical evidence of the impact of FEMA's current approach to CBA, Part III points to studies documenting how FEMA's programs fail to address—and may even exacerbate—social vulnerability to flooding. With these effects in mind, Part IV surveys previous legal challenges to FEMA's funding decisions and describes why none provide promising avenues for relief. Turning instead to policy solutions, Part V proposes several adjustments to how FEMA conducts CBA to better incorporate distributional concerns into its flood-mitigation programs.

I. COST-BENEFIT ANALYSIS AS A REGULATORY DECISION-MAKING TOOL

CBA is the dominant method of reviewing proposed regulations and policies at the federal level. The government's reliance on CBA is primarily aimed at maximizing economic efficiency, though federal guidance instructs that effects on vulnerable populations should play a role in the analysis. The executive branch has repeatedly committed to analyzing the distributional effects of its policies—considering who is benefitted, who is burdened, and by how much—but these mandates have largely gone unheeded. This Part briefly describes the origins of CBA and how various presidential administrations have chosen to address distributional considerations when conducting regulatory analyses. It then discusses how the standard efficiency justification for CBA fails to account for unequal distributions of wealth, an issue that is consequential for FEMA's flood-mitigation policies.

A. Cost-Benefit Analysis in Federal Regulation

The federal government's use of CBA originated in the Flood Control Act of 1936,¹⁷ which mandated that water-control projects executed by the U.S. Army Corps of Engineers produce benefits exceeding their costs.¹⁸ It wasn't until the 1980s, however, that CBA became a fixture of centralized regulatory review

¹⁷ Pub. L. No. 74-738, 49 Stat. 1570 (codified at 33 U.S.C. § 701a).

¹⁸ Don Bradford Hardin, Jr., Comment, *Why Cost-Benefit Analysis? A Question (and Some Answers) About the Legal Academy*, 59 ALA. L. REV. 1135, 1143 (2008).

administered through the Office of the President. While earlier administrations used economic analysis as one factor in evaluating agency action, the Reagan administration adopted CBA as a strict decision rule that could make or break a proposed regulation.¹⁹ President Ronald Reagan's Executive Order 12,291 required that agencies promulgating "major" regulations ensure that "the potential benefits to society for the regulation outweigh the potential costs."²⁰ The Order also placed the Office of Management and Budget (OMB) in charge of ensuring compliance with these guidelines.²¹ Environmentalists and regulatory agencies have frequently cast CBA as a deregulatory tool,²² arguing that the selection of discount rates, the uncertainty of future risks, and the difficulty of assigning a value to environmental benefits and human lives undermine CBA's apparent objectivity.²³ Nevertheless, all administrations since President Reagan's have endorsed CBA in some form.

Subsequent Democratic administrations have nominally incorporated distributional considerations into regulatory review, though agencies have yet to implement distributional analysis in a systematic way.²⁴ The Clinton administration replaced the Reagan-era order with Executive Order 12,866, weakening CBA from a mandatory decision rule into a single, optional factor in the decision-making process.²⁵ It also required that agencies consider distributive impacts and equity when choosing among

¹⁹ See Cole, *supra* note 11, at 5.

²⁰ 3 C.F.R. 128–30. Major rules were defined as those having "[a]n annual effect on the economy of \$100 million or more;" "[a] major increase in costs or prices for consumers," industry, or government; or "[s]ignificant adverse effects on competition, employment, investment, productivity, [or] innovation." 3 C.F.R. 127.

²¹ 3 C.F.R. 131.

²² See, e.g., Daniel A. Farber, *Rethinking the Role of Cost-Benefit Analysis*, 76 U. CHI. L. REV. 1355, 1365–67, 1392 (2009) (reviewing RICHARD L. REVESZ & MICHAEL A. LIVERMORE, *RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH* (2008)) (explaining how CBA as practiced often underestimates future harms and overestimates industry compliance costs); David M. Driesen, *Is Cost-Benefit Analysis Neutral?*, 77 U. COLO. L. REV. 335, 364–80 (2006) (analyzing twenty-five rules reviewed by OMB between 2001 and 2002 and finding that OMB recommended weakening environmental, health, or safety protections in twenty-four out of the twenty-five, even when the agency submitted a positive cost-benefit ratio).

²³ See Cole, *supra* note 11, at 6–12.

²⁴ See Lisa A. Robinson, James K. Hammitt & Richard J. Zeckhauser, *Attention to Distribution in U.S. Regulatory Analyses*, 10 REV. ENV'T ECON. & POL'Y 308, 316 (2016) ("[F]ederal agencies largely ignore, and the OMB does not enforce, the guidance on distributional analysis contained in Executive Orders 12866 and 13563 and OMB Circular A-4.").

²⁵ Cole, *supra* note 11, at 7.

alternatives.²⁶ Executive Order 12,866 has remained in place since the Clinton administration, though the degree to which the executive branch has emphasized distributional outcomes has varied.²⁷ President Joe Biden has taken a strong stance on the importance of considering equity, emphasizing the role that regulatory review may play in addressing “systemic racial inequality[] and the undeniable reality and accelerating threat of climate change.”²⁸ To that end, President Biden has ordered the director of OMB to “propose procedures that take into account the distributional consequences of regulations, including as part of any quantitative or qualitative analysis of the costs and benefits of regulations, to ensure that regulatory initiatives appropriately benefit and do not inappropriately burden disadvantaged, vulnerable, or marginalized communities.”²⁹ This suggests that the time is ripe for addressing how FEMA’s CBA policies fail to address many communities’ vulnerability to climate change, as Part III describes.

Of course, federal funds are limited, and government agencies must adopt some framework for deciding where these scarce funds are invested. CBA serves as a useful decision criterion for identifying projects and policies that may make everyone better off.³⁰ However, those who defend CBA on the grounds that it maximizes economic efficiency often make unrealistic assumptions *ex ante* about how the wealth produced via efficient regulations will be redistributed. For this reason, even as CBA has grown in prominence among regulators, the methodology has been consistently criticized by academics.

²⁶ Exec. Order No. 12,866, 3 C.F.R. 638 (1994). This approach was reaffirmed under the Obama administration. *See* Exec. Order No. 13,563, 3 C.F.R. 215 (2012).

²⁷ President George W. Bush took a primarily deregulatory stance with the appointment of John Graham as head of the Office of Information and Regulatory Affairs (OIRA), who generally prevented the promulgation of new health standards completely. President Barack Obama revoked President Bush’s orders and effectively reinstated President Bill Clinton’s version of CBA. President Donald Trump issued an Executive Order adopting the requirement that agencies repeal two existing rules for every new rule issued and setting a regulatory budget for each agency. *See* Daniel A. Farber, *Regulatory Review in Anti-regulatory Times*, 94 CHI.-KENT L. REV. 383, 387–88, 400 (2019) (citing Exec. Order No. 13,771, 3 C.F.R. 284 (2018)).

²⁸ Joseph R. Biden, Jr., *Modernizing Regulatory Review*, WHITE HOUSE (Jan. 20, 2021), <https://perma.cc/992T-YTD5>.

²⁹ *Id.*

³⁰ *See, e.g.,* Zachary Liscow, *Is Efficiency Biased?*, 85 U. CHI. L. REV. 1649, 1694 (2018).

B. Defenses and Critiques of Cost-Benefit Analysis

The approach to CBA required by OMB and endorsed by FEMA is motivated by the principle that maximizing overall wealth produces the greatest social welfare benefits. The pursuit of efficiency is not about growing wealth for its own sake; it is about identifying and increasing the various inputs that improve quality of life. For efficient policies to be welfare maximizing, however, the wealth created ought to be shared broadly.³¹ As the next two sections argue, where CBA is applied to highly unequal distributions of wealth, a single-minded focus on efficiency can fail to improve well-being and can entrench existing inequalities.

1. The efficiency justification.

The federal government's consistent use of CBA for evaluating administrative action is grounded in the theory that government regulations should maximize economic efficiency. Under this view, agencies should adopt regulations that grow the economic pie, such that the "winners" of a policy could compensate the "losers" with a larger slice than under a less efficient policy.³² OMB guidance, which FEMA relies on to conduct CBA, explicitly adopts this wealth-maximization approach: "The principle of maximizing net present value of benefits is based on the premise that gainers could fully compensate the losers and still be better off."³³ Importantly, the guidance specifies that "[t]he presence or absence of such compensation should be indicated in the analysis."³⁴

The issue is that little is known about whether redistribution actually occurs.³⁵ Proponents of CBA argue that even if the losers of a particular policy are not directly compensated after its adoption, the results will ideally even out over time such that the losers of one policy may become the winners of the next.³⁶ However, policy makers may place too much faith in the likelihood of

³¹ See *id.* at 1660–61.

³² See *id.* at 1652–53. This principle is called Kaldor-Hicks efficiency. *Id.* at 1652. Taxation is assumed to be the best method of redistributing wealth because it minimizes the behavioral distortions—such as reducing incentives to work or producing goods that are "too safe"—associated with redistribution through the judicial or regulatory system. See Lee Anne Fennell & Richard H. McAdams, *The Distributive Deficit in Law and Economics*, 100 MINN. L. REV. 1051, 1057–58 (2016).

³³ See OFF. OF MGMT. & BUDGET, CIRCULAR A-94, GUIDELINES AND DISCOUNT RATES FOR BENEFIT-COST ANALYSIS OF FEDERAL PROGRAMS 12 (2003).

³⁴ *Id.*

³⁵ See Liscow, *supra* note 30, at 1666.

³⁶ *Id.* at 1663–64.

redistribution for several reasons: legislative offsetting via the tax system is frequently imprecise, legislatures experience inertia or interest-group capture, and there may be high political costs to redistribution due to conventional norms regarding fairness and desert.³⁷

Even if benefits are not fully redistributed, agencies might still prefer CBA as a decision rule if it is a less costly method of gathering and analyzing relevant information than alternative methods.³⁸ Additionally, CBA increases the transparency of regulatory decisions by subjecting agencies to the scrutiny of other government supervisors and the public. This allows those impacted by agency decisions to contest the policy trade-offs or valuations made.³⁹ However, under certain conditions, such as when a proposed project will affect people with highly unequal levels of wealth or who are poorly informed about the consequences, many scholars agree that agencies should modify or depart from CBA.⁴⁰

2. The wealth-effects critique.

Whether redistribution occurs matters when evaluating policies that affect populations with highly unequal wealth. Because the welfare benefits produced by a policy do not have a market value, agencies must estimate indirectly the price that an individual would be willing to pay to obtain them. Yet because the marginal value of a dollar decreases with income—that is, the wealthy value each additional dollar less than the poor do—the wealthy will display a greater willingness to pay just by dint of having more money to spare.⁴¹

Willingness to pay is often inferred from consumption decisions that do not align with the welfare the consumption produces. For example, in deciding where to locate an industrial facility, a permitting agency might infer that home values in neighborhoods exposed to different levels of pollution “reveal” the value homeowners place on clean air. However, this metric does not capture how much rich and poor homeowners *benefit* by breathing clean air; instead, it is largely a proxy for preexisting distributions of

³⁷ Fennell & McAdams, *supra* note 32, at 1083–1107.

³⁸ See Matthew D. Adler & Eric A. Posner, *Rethinking Cost-Benefit Analysis*, 109 YALE L.J. 165, 225–33 (1999).

³⁹ *Id.* at 245–46.

⁴⁰ *Id.* at 246.

⁴¹ John Bronsteen, Christopher Buccafusco & Jonathan S. Masur, *Well-Being Analysis vs. Cost-Benefit Analysis*, 62 DUKE L.J. 1603, 1652 (2013).

wealth.⁴² This problem recurs in the structure of many government funding programs. For example, the Department of Transportation requires that applicants for infrastructure grants quantify the value of time commuters save from a transportation project based on the incomes of those who use the mode of transit. Yet because individuals who travel by bus tend to have lower incomes than those who fly or use high-speed rail, time savings for bus infrastructure are lower and investments appear relatively less cost justified.⁴³

The difficulty of accurately capturing welfare benefits can also be seen in FEMA's mitigation policies. The flood-mitigation programs operated by FEMA, described further in Part II, require that spending on flood-mitigation projects produce equal or greater benefits in the form of averted property damage and loss of life. This metric would support protecting five homes worth \$1 million dollars each but not forty-nine homes worth \$100,000. Yet protecting forty-nine homeowners would almost certainly produce greater welfare benefits than protecting just five.⁴⁴ Using property value to allocate investments may therefore result in policies that produce lesser welfare gains than otherwise possible.

When wealth effects are present and the tax system does not effectively redistribute the monetary benefits produced by a policy, then CBA entrenches policies that benefit the rich.⁴⁵ When this is so, less efficient rules that are less biased against the poor may be justified.⁴⁶ At the very least, it seems that the distributive effects of the policy should be made clear to facilitate review of the trade-offs being made. However, as currently designed, FEMA's methodology does not sufficiently account for these types of distributive effects, making it difficult for those impacted by its programs to properly evaluate its policy judgments.⁴⁷

CBA as conducted in federal regulatory review has the potential to identify policies that improve overall well-being if the

⁴² *Id.* at 1653–54.

⁴³ Liscow, *supra* note 30, at 1689–91.

⁴⁴ See Bronsteen et al., *supra* note 41, at 1652–54.

⁴⁵ Liscow, *supra* note 30, at 1688–91. Technically, you could have a policy that is “poor-biased” because an individual’s willingness to pay for certain goods decreases as their income rises. For instance, building a public swimming pool in a poor neighborhood is likely to be more efficient than the same action in a rich neighborhood. The rich are more able to build their own private pools and, therefore, would demonstrate a lower willingness to pay for this good. These types of policies are uncommon. *Id.* at 1677–79.

⁴⁶ *Id.* at 1693–1700.

⁴⁷ See *infra* Part II.B.

benefits are widely distributed. However, the difficulty of quantifying intangible benefits and the absence of redistribution mean that CBA often allocates more benefits to those who have greater property holdings and wealth. Having established the potential advantages and disadvantages of CBA as a decision-making criterion, the next Part discusses the specific methodology employed by FEMA in its flood-mitigation policies. It argues that, by prioritizing the protection of property value (a highly unequally distributed resource), FEMA's methodology falls prey to the wealth-effects critique just described and fails to account for the broader welfare effects of flooding.

II. COST-BENEFIT ANALYSIS IN FEMA'S MITIGATION PROGRAMS

CBA is central to FEMA's administration of flood-mitigation programs—those that help communities prepare for and minimize the effects of future flooding. FEMA is the primary federal agency responsible for funding natural-disaster preparation and response. Between 2005 and 2016, FEMA spent almost \$63 billion dollars on public sector flood-relief and mitigation projects, constituting 42% of the \$143 billion paid out by all federal disaster relief programs.⁴⁸ FEMA's role will likely grow as storms become more frequent and intense, placing a greater burden on the federal budget. The cost-effectiveness of its programs is therefore likely to come under increasing scrutiny. This Part introduces FEMA's three mitigation-oriented programs. It then describes the statutory and regulatory requirements governing CBA and the methodology FEMA uses to evaluate the cost-effectiveness of the projects it funds.

A. FEMA's Hazard Mitigation Assistance Programs

Disaster policy in the United States is increasingly shifting from a focus on recovery from individual disasters toward centralized mitigation planning. In the late nineteenth and early twentieth centuries, Congress took an ad hoc and reactive approach to flood management, adopting new legislation after each disaster struck.⁴⁹ Recognizing the benefits of planning and preparation,

⁴⁸ CONG. BUDGET OFF., *supra* note 10, at 12. Other sources of funding include the U.S. Army Corps of Engineers and the Departments of Transportation, Housing and Urban Development, Defense, and Health and Human Services.

⁴⁹ NATALIE KEEGAN, CONG. RSCH. SERV., R4047, FEMA'S HAZARD MITIGATION GRANT PROGRAM: OVERVIEW AND ISSUES 1 (2009). The rate of legislation was almost one

Congress passed legislation in 1950 that shifted the power to declare disasters and coordinate the distribution of recovery funds from Congress to the president.⁵⁰ A series of increasingly expensive natural disasters during the 1960s and '70s induced Congress to implement mitigation programs in an effort to limit future property damage and loss of life. The 1988 Robert T. Stafford Disaster Relief and Emergency Assistance Act⁵¹ (Stafford Act) furthered this goal by establishing the first federal mitigation program.⁵² Congress has since expanded on FEMA's mitigation programs in an effort to "reduce the risk to individuals and property from natural hazards, while simultaneously reducing reliance on Federal disaster funds."⁵³ The need for mitigation has grown more urgent as the National Flood Insurance Program (a government insurance program administered by FEMA for property owners in high-risk flood zones) has fallen further into debt.⁵⁴ Furthermore, because FEMA is on the hook for recovery and rebuilding costs to homeowners, renters, and businesses after a storm hits, it is in the agency's interest to minimize the amount that it pays out by reducing risk to high-value properties.

While postdisaster recovery and rebuilding efforts currently make up the majority of FEMA's grant awards, this Comment focuses on mitigation efforts because of the agency's increasing focus on long-term risk reduction and because of mitigation projects' greater potential to alter patterns of flood vulnerability. FEMA administers three programs under the umbrella of HMA, each with a slightly different purpose. The Hazard Mitigation Grant Program (HMGP) implements mitigation measures during the reconstruction phase following a natural disaster.⁵⁵ The Flood

act per year: Congress passed 128 disaster-assistance bills between 1803 and 1938. *Id.* (citing 96 CONG. REC. H11,899–11,902 (daily ed. August 7, 1950) (statement of Rep. Hagen)).

⁵⁰ See Disaster Relief Act of 1950, Pub. L. No. 81-875, 64 Stat. 1109 (1950).

⁵¹ Pub. L. No. 100-707, 102 Stat. 4689 (1988) (amending Pub. L. No. 93-288, 88 Stat. 143 (1974)) (codified as amended at 42 U.S.C. §§ 5121–5202).

⁵² KEEGAN, *supra* note 49, at 3. While FEMA was created by executive order by President Jimmy Carter in 1979, the Stafford Act also expanded FEMA's responsibilities. See *History of FEMA*, FEMA, <https://perma.cc/62QF-NJQX>.

⁵³ FEMA, *supra* note 12, at 1.

⁵⁴ The program accumulated \$24.6 billion in debt by 2017 before Congress canceled \$16 billion to pay for claims from Hurricanes Harvey, Irma, and Maria. DIANE P. HORN, CONG. RSCH. SERV., IF10988, A BRIEF INTRODUCTION TO THE NATIONAL FLOOD INSURANCE PROGRAM 2 (2020). FEMA has also fallen under scrutiny for inadequately managing severe repetitive-loss properties—those that repeatedly flood. See OFF. OF THE INSPECTOR GEN., FEMA IS NOT EFFECTIVELY ADMINISTERING A PROGRAM TO REDUCE OR ELIMINATE DAMAGE TO SEVERE REPETITIVE LOSS PROPERTIES 6 (2020).

⁵⁵ FEMA, *supra* note 12, at 4.

Mitigation Assistance (FMA) Program aims to control specifically those costs arising from federally subsidized flood insurance and is therefore targeted at properties insured by such programs.⁵⁶ Most recently, FEMA established the Building Resilient Infrastructure and Communities (BRIC) program. Signaling the agency's shift toward prevention, the program seeks to "promote a national culture of preparedness" by investing in infrastructure protection that minimizes future losses.⁵⁷ HMA funds may be used for a variety of physical projects, including retrofitting, elevating, or otherwise floodproofing buildings; building drainage and stormwater management infrastructure; and constructing flood barriers like dams, levees, and floodwalls.⁵⁸ Applicants may also use grant funds to administer voluntary "buyout" programs, whereby local governments acquire and then demolish or relocate properties located in flood plains. This allows the land to be converted into open space that serves as a flood buffer for remaining homes.⁵⁹

Multiple levels of government are involved in administering FEMA's grant programs. Grant applicants (including states, territories, and federally recognized tribes) solicit project proposals from subapplicants (primarily state agencies or local governments).⁶⁰ Applicants then submit project applications to FEMA, which evaluates eligibility and makes award determinations. If the applications are successful, state and tribal entities disburse funds to local governing bodies for implementation. State and local applicants must also contribute a share (typically 25%) of the total project cost.⁶¹

Mitigation programs might soon see a large increase in funding due to the COVID-19 pandemic. While the FMA Program receives a steady flow of funding via flood insurance premiums,⁶² funding

⁵⁶ 44 C.F.R. § 78.1.

⁵⁷ 85 Fed. Reg. 20,291, 20,291–92 (Apr. 10, 2020). This regulation was authorized by § 1234 of the Disaster Recovery Reform Act of 2018 (DRRA), Pub. L. No. 115-254, 132 Stat. 3438 (2018) (codified at 42 U.S.C. § 5133).

⁵⁸ FEMA, *supra* note 12, at 36.

⁵⁹ *Id.* at 34.

⁶⁰ *Id.* at 5.

⁶¹ *Id.* at 26. The cost share increases to 90% for "small impoverished communities," defined as "a community of 3,000 or fewer individuals that is economically disadvantaged, as determined by the State in which the community is located and based on criteria established by the President." 42 U.S.C. § 5133(a), (h)(2).

⁶² NICOLE T. CARTER, DIANE P. HORN, EUGENE BOYD, EVA LIPIEC, MEGAN STUBBS, JONATHAN L. RAMSEUR & ANNA E. NORMAND, CONG. RSCH. SERV., R45017, FLOOD RESILIENCE AND RISK REDUCTION: FEDERAL ASSISTANCE AND PROGRAMS 15 (2019).

for the other two HMA programs is calculated as a percentage of all recovery funds made available after a presidentially declared disaster.⁶³ President Biden has announced that funding dedicated to the COVID-19 response—declared a nationwide emergency by President Donald Trump—may be incorporated into this baseline calculation. This may result in up to \$10 billion being directed toward mitigation without the need for congressional authorization,⁶⁴ a massive increase over the \$500 million available in BRIC’s first round of funding.⁶⁵

B. FEMA’s Cost-Benefit Methodology

In order to be eligible for funding under any of the three HMA programs, applicants must demonstrate that their projects are cost-effective.⁶⁶ While in some contexts cost-effectiveness implies merely that a project incurs the fewest costs among alternatives given a fixed quantity of benefits,⁶⁷ FEMA has interpreted the term more stringently to mean that projects must have benefits outweighing their costs.⁶⁸ Project applicants can meet this criterion by demonstrating that their project has a positive benefit-cost ratio calculated using a FEMA-approved methodology.⁶⁹

⁶³ *Id.* at 14–15; *see also* Pub. L. No. 115-254, § 1234, 132 Stat. 3641, 3462 (2018).

⁶⁴ Christopher Flavelle, *New U.S. Strategy Would Quickly Free Billions in Climate Funds*, N.Y. TIMES (Jan. 25, 2021), <https://perma.cc/KFD4-8XRB>.

⁶⁵ FEMA, THE DEPARTMENT OF HOMELAND SECURITY (DHS): NOTICE OF FUNDING OPPORTUNITY (NOFO) FY 2020 BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES 4 (2020), <https://perma.cc/Q6NM-3QCN>.

⁶⁶ *E.g.*, 42 U.S.C. § 5170c(a) (stating that HMGP funds may be used for “mitigation measures which the President has determined are cost effective and which substantially reduce the risk of, or increase resilience to, future damage, hardship, loss, or suffering in any area affected by a major disaster”); 42 U.S.C. § 4104c(c)(2)(A)(i) (stating that FMA funds may be used for “mitigation activities that the [FEMA director] determines are technically feasible and cost-effective”); 42 U.S.C. § 5133(b) (stating that BRIC funds may be used “to assist in the implementation of predisaster hazard mitigation measures that are cost-effective and are designed to reduce injuries, loss of life, and damage and destruction of property”).

⁶⁷ OFF. OF MGMT. & BUDGET, *supra* note 33, at 5.

⁶⁸ *See* KEEGAN, *supra* note 49, at 7; *see also* 44 C.F.R. § 206.434(c)(5)(ii) (requiring that HMGP project applicants demonstrate that the project is cost-effective by showing that it “[w]ill not cost more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area”); 44 C.F.R. § 78.11(a) (incorporating the same definition of cost-effectiveness); FEMA, *supra* note 65, at 3 (requiring that BRIC projects “have a benefit-cost ratio (BCR) of 1.0 or greater,” such that they “reduc[e] risk and future disaster costs in excess of the cost of mitigation”).

⁶⁹ FEMA, *supra* note 12, at 64. Under FEMA’s methodology, expected annual benefits (EABs) are equal to the expected annual damages before mitigation minus the expected annual damages after mitigation. The EAB is discounted over the life of the project (at a rate set by OMB) to produce the net present value of expected annual benefits, which

Under FEMA's methodology, benefits are equal to the expected flood-related damages without mitigation minus expected damages with mitigation.⁷⁰ For example, if expected damages from a flood in a certain coastal area are \$10 million and mitigation measures could reduce these expected damages to \$3 million, the benefit of the mitigation measures would be assessed at \$7 million under FEMA's methodology. FEMA counts as benefits all the costs that would be averted by improved flood protection—physical damage, loss of public services or facilities, injuries or deaths, temporary housing costs, loss of business income, and administrative costs.⁷¹ Benefits must have a direct relationship to the proposed project and, therefore, do not include changes in regional economic production, incomes, or employment resulting from project construction.⁷² The expected benefits from a flood-mitigation project are weighed against the expected costs of the project. Eligible costs include construction costs, title searches, permit applications, and maintenance costs.⁷³ However, costs such as a reduced tax base, indirect economic loss, and transfer payments such as insurance premiums are not factored into FEMA's cost calculations.⁷⁴

While FEMA's distribution of HMA funds is not itself subject to OMB oversight, the agency closely follows federal guidance in evaluating project applications. FEMA requires CBA to be conducted in accordance with *OMB Circular A-94*,⁷⁵ which directs agencies on how to evaluate the economic impacts of proposed regulations.⁷⁶ Like the presidential executive orders, this document calls for the consideration of distributional outcomes, noting that “[w]hen benefits and costs have significant distributional effects, these effects should be analyzed and discussed, along with the analysis of net present value.”⁷⁷ However, this distributional

can be directly compared to the net present cost of mitigation. See FEMA, ENGINEERING PRINCIPLES AND PRACTICES FOR RETROFITTING FLOOD-PRONE RESIDENTIAL STRUCTURES, APPENDIX B: UNDERSTANDING THE FEMA BENEFIT-COST ANALYSIS PROCESS B-2 to B-4 (2012).

⁷⁰ FEMA, *supra* note 69, at B-2 (defining project benefits as “the future damages or losses that are expected to be avoided as a result of the proposed mitigation project”).

⁷¹ FEMA, INTRODUCTION TO BENEFIT-COST ANALYSIS INSTRUCTOR GUIDE UNIT 3: THE BENEFIT-COST MODEL 3-9 to 3-23 (2019).

⁷² *Id.* at 3-24.

⁷³ See *id.* at 3-27.

⁷⁴ *Id.* at 3-28.

⁷⁵ FEMA, *supra* note 12, at 64.

⁷⁶ See generally OFF. OF MGMT. & BUDGET, *supra* note 33.

⁷⁷ *Id.* at 12.

mandate is notably absent from FEMA's guidance on CBA, which simply requires applicants for flood-mitigation funds to document that the benefits of the project outweigh the costs.⁷⁸ This is consistent with the general disregard for distributional effects in federal regulatory analysis. President Bill Clinton's Executive Order 12,898, for example, required federal agencies to take disproportionate health and environmental impacts on minority or low-income populations into account in rulemaking.⁷⁹ This Order has largely failed to influence agency behavior, however, including that of the Environmental Protection Agency.⁸⁰ Similarly, President Barack Obama's Executive Order 13,563 instructed agencies to consider intangible benefits like "equity, human dignity, fairness, and distributive impacts" in regulatory review.⁸¹ This, too, went mostly unheeded by regulatory agencies, as most CBAs submitted to OMB relied simply on the monetized benefits outweighing the costs.⁸² These examples suggest a reluctance across the federal government to step outside the bounds of CBA as traditionally practiced.

FEMA has begun to lay the groundwork for a more holistic approach to risk assessment. The agency recently developed a National Risk Index (NRI) to "help identify communities most at risk for natural hazards."⁸³ The NRI measures three aspects of natural hazard risk: social vulnerability, community resilience, and expected annual loss.⁸⁴ FEMA defines social vulnerability as the "social, economic, demographic, and housing characteristics" that influence a community's ability to cope and respond to natural disasters.⁸⁵ Community resilience measures a community's ability "to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions."⁸⁶ Finally, expected annual loss estimates the expected

⁷⁸ See FEMA, *supra* note 12, at 44.

⁷⁹ Exec. Order No. 12,898, 3 C.F.R. 859 (1995).

⁸⁰ See Richard L. Revesz, *Regulation and Distribution*, 93 N.Y.U. L. REV. 1489, 1534–40 (2018).

⁸¹ 3 C.F.R. 216 (2012).

⁸² *Id.* at 1541–42.

⁸³ FEMA, NATIONAL RISK INDEX TECHNICAL DOCUMENTATION 1-1 (2020).

⁸⁴ *Id.* at 4-1.

⁸⁵ *Id.* FEMA uses the SVI developed by the Hazards & Vulnerability Research Institute at the University of South Carolina, which incorporates twenty-nine socioeconomic variables. See *Social Vulnerability Index for the United States - 2010-2014*, HAZARDS & VULNERABILITY RSCH. INST., UNIV. OF S.C., <https://perma.cc/5KFH-RKAR>.

⁸⁶ FEMA, *supra* note 83, at 4-3. The resilience index incorporates a community's financial resources (including past mitigation funding and disaster aid recipients), physical

monetary value of lost property, lives, and agriculture based on historic losses and predicted annual frequency of storms, which aligns most closely with the benefits currently measured by FEMA's CBA methodology.⁸⁷ Each factor is combined into a total risk score that FEMA recommends that emergency planners use to update mitigation plans, communicate risk levels to homeowners and community members, support updates to building codes, and “[p]rioritize and allocate resources.”⁸⁸ As of yet, the NRI is used “for planning purposes only” and does not replace the CBA criteria.⁸⁹ That is, while the NRI may assist applicants in selecting which among already-eligible projects to prioritize, it does not alter which projects qualify for funding in the first place. FEMA's openness to considering social vulnerability in the planning stages sounds a hopeful note that it may be willing to adjust the parameters of its CBA as well.

While FEMA's cost-benefit policy as currently practiced has the benefits of technical consistency across applicants, it operationalizes risk primarily in terms of immediate physical impacts. It fails to capture long-term effects or effects that are not easily quantified. Furthermore, the methodology fails to consider how physical risk may interact with social vulnerability—the factors that influence an individual or a community's ability to return to life as normal after disaster strikes. The next Part examines how CBA as currently conducted results in pervasive disparities in communities' abilities to recover and respond to flooding.

III. THE IMPACT OF NATURAL DISASTERS ON SOCIAL VULNERABILITY

To understand why the use of a facially neutral funding formula like FEMA's flood-mitigation grant methodology may exacerbate socioeconomic inequities, this Part examines the unequal landscape to which CBA is applied. It presents the concept of social vulnerability as an alternative conception of risk to averted property damage. It then presents evidence that FEMA's mitigation programs may sustain or even exacerbate existing social vulnerability.

infrastructure, and government and social capacity and is based on the Baseline Resilience Indicators for Communities index developed by the University of South Carolina. *See Social Vulnerability Index for the United States - 2010-2014*, *supra* note 85.

⁸⁷ *See* FEMA, *supra* note 83, at 4-4 to 4-5.

⁸⁸ *Id.* at 1-1.

⁸⁹ *Id.* at 3-4.

A. Social Vulnerability Influences a Community's Ability to Respond to Natural Disasters

FEMA's cost-benefit methodology conceptualizes flood risk primarily in terms of property damage, leading the agency to neglect the social costs of disasters. Given that the agency is on the hook for insurance payouts and rebuilding grants when storms strike, it is rational for policy makers to minimize future payouts by protecting high-value properties. This is especially true given that low-income households are less likely to be covered by insurance, including from the National Flood Insurance Policy program.⁹⁰ However, this property-based approach evades FEMA's dual mandate under the Stafford Act to help local governments minimize both "damage" and "suffering" resulting from disasters.⁹¹ That is, while FEMA's programs effectively account for the value of property and even lives lost due to flooding, they fail to capture the many intangible harms that result when natural disasters hit communities that lack a safety net. The fallout from a devastating storm may cause suffering that lasts long after the flooding recedes as individuals struggle to find safe and sanitary housing, maintain or recover employment, and address health issues. Yet, currently, FEMA's policies best protect those individuals who have the economic security to avoid these long-term consequences.

Though hazard risk is often framed in terms of the intensity of natural disasters and the resulting damage to property, risk might alternatively be thought of in terms of social vulnerability. Social vulnerability is a concept developed by researchers of natural disasters to describe the socioeconomic factors that influence a community's ability to respond to and recover from natural hazards.⁹² Many factors influence vulnerability to flooding.

⁹⁰ Lower-income homeowners are also less likely to have flood insurance and may lack the necessary assets to secure loans to rebuild. The median income of the 3.3 million individuals living in FEMA-designated flood zones who do not hold National Flood Insurance Policy policies is \$37,000 less than that of the 1.8 million policyholders. See U.S. DEP'T OF HOMELAND SEC., AN AFFORDABILITY FRAMEWORK FOR THE NATIONAL FLOOD INSURANCE PROGRAM 11 (2018).

⁹¹ 42 U.S.C. § 5121(b).

⁹² See generally Susan L. Cutter, Bryan J. Boruff & W. Lynn Shirley, *Social Vulnerability to Environmental Hazards*, 84 SOC. SCI. Q. 242 (2003). The SVI originally developed by Professor Susan Cutter has been adapted by other researchers and government agencies, including the CDC. The CDC has developed its own version of the SVI to help identify communities most vulnerable to natural disasters who may require additional supplies, emergency personnel, evacuation planning, and emergency shelters. See CTRS. FOR DISEASE CONTROL & PREVENTION, *supra* note 7.

Lower-income individuals who cannot afford to purchase their own home are subject to landlords' decisions regarding whether to flood-proof apartments or rebuild after a storm.⁹³ When storms hit, the poor frequently lack access to a vehicle or the expendable income necessary to evacuate.⁹⁴ After a storm, those who work low-wage jobs often do not have the flexibility to take time off to recover or make repairs. And when flood-relief funds become available, individuals with lower levels of education or political engagement may lack the know-how to navigate complicated application forms.⁹⁵ Race and ethnicity may also play a role, as members of minority households—especially those who are non-English speaking—may be less well connected to official sources of information or distrustful of government instructions.⁹⁶

Social vulnerabilities are often concentrated along geographic lines and may be reinforced by patterns of disinvestment. There is some evidence to suggest that areas that were historically redlined—denied federally backed mortgages due to the race of residents—currently face higher flood risks than areas that were not.⁹⁷ Redlined areas received less private investment in the housing stock and experienced lower home values in subsequent decades,⁹⁸ an effect that may make it harder for them to qualify for mitigation funding in the present. Low-income households are more likely to seek out affordable housing in high-risk areas than middle-income households, and they experience higher flood damages as a result.⁹⁹ Indeed, neighborhoods tend to see a decline in housing prices following storm damage, followed by an influx of lower-income homeowners. However, households that relocate to storm-ravaged areas tend to be more likely to default on their

⁹³ Kathleen Tierney, *Social Inequality, Hazards, and Disasters*, in *ON RISK AND DISASTER: LESSONS FROM HURRICANE KATRINA* 109, 113–14 (Ronald J. Daniels et al. eds., 2006).

⁹⁴ *Id.* at 114–15.

⁹⁵ *See id.* at 115.

⁹⁶ *Id.* at 116–17.

⁹⁷ Lily Katz, *A Racist Past, a Flooded Future: Formerly Redlined Areas Have \$107 Billion Worth of Homes Facing High Flood Risk—25% More than Non-redlined Areas*, REDFIN NEWS (Mar. 14, 2021), <https://perma.cc/52H2-NN75>.

⁹⁸ *See* Daniel Aaronson, Daniel Hartley & Bhashkar Mazumder, *The Effects of the 1930s HOLC “Redlining” Maps* 31 (Fed. Rsrv. Bank of Chi., Working Paper No. 2017-12, Aug. 2020).

⁹⁹ Camilo Sarmiento & Ted E. Miller, *Inequities in Flood Management Protection Outcomes*, AM. AGRIC. ECON. ASS'N MEETINGS 12–15 (2006).

mortgages and often pay higher interest rates than previous owners.¹⁰⁰ Affordability therefore comes at the cost of security.

The concentration of vulnerable populations in high-risk areas can fuel a cycle of neighborhood decline. When residents lack the funds to rebuild after a storm, neighborhoods may see an increase in blighted properties, higher residential and commercial vacancy rates, and home prices that drop further still. This diminishes the property tax base and squeezes the quality and quantity of amenities that municipalities can provide.¹⁰¹ All of this suggests that investments in flood mitigation may play a powerful role in stemming the cycle of concentrated poverty. Conversely, policies that disproportionately invest in high-property-value areas rather than high vulnerability areas exacerbate inequality.

B. Relief Awards Based on Property Value Neglect Social Vulnerability

FEMA's flood-mitigation investments can widen the gap between different communities' capacities to respond to natural disasters. FEMA is more likely to protect areas with high property values and low social vulnerability. When decisions about flood-mitigation investments are made based on property value alone, communities with high levels of social vulnerability are estimated to receive less infrastructure investment.¹⁰² And while FEMA's methodology does consider other factors like loss of life and business income, empirical studies of the distribution of HMA funds show that they are disproportionately directed toward whiter and wealthier communities.¹⁰³

While less socially vulnerable areas are more likely to be fortified against flooding, high-social-vulnerability areas are more likely to be abandoned.¹⁰⁴ Under FEMA's HMGP, even when investment in protective infrastructure is not cost-effective, properties may still be eligible for a voluntary buyout—a

¹⁰⁰ Dimuthu Ratnadiwakara & Buvaneshwaran Venugopal, *Do Areas Affected by Flood Disasters Attract Lower-Income and Less Creditworthy Homeowners?*, 29 J. HOUS. RSCH. S121, S129 (2020).

¹⁰¹ Carolyn Kousky, Howard Kunreuther, Michael LaCour-Little & Susan Wachter, *Flood Risk and the U.S. Housing Market*, 29 J. HOUS. RSCH. S4, S15–18 (2020).

¹⁰² Jeremy Martinich, James Neumann, Lindsay Ludwig & Lesley Jantarasami, *Risks of Sea Level Rise to Disadvantaged Communities in the United States*, 18 MITIGATION & ADAPTATION STRATEGIES FOR GLOB. CHANGE 169, 177–79 (2013).

¹⁰³ See Rebecca Hersher & Robert Benincasa, *How Federal Disaster Money Favors the Rich*, NPR (Mar. 5, 2019), <https://perma.cc/9Q6G-G4RS>.

¹⁰⁴ Martinich et al., *supra* note 102, at 178–79.

government purchase that is subject to refusal, unlike eminent domain—if they are deemed “[s]ubstantially [d]amaged.”¹⁰⁵ This standard is met if repairs would cost 50% or more of the prestorm value and the property is located within a 100-year floodplain.¹⁰⁶ Because low-value homes are more likely to be located in flood-prone areas and to be poorly constructed (such that a lesser amount of damage is necessary to constitute 50% of the home’s value), these properties are more likely to be bought out.¹⁰⁷ While homeowners are allowed to rebuild in accordance with updated building standards, the money received via the HMGP program does not cover these additional improvements. Wealthier homeowners may have the private funds to be able to meet the more stringent rebuilding requirements, but poorer homeowners are often forced to relocate.¹⁰⁸ Furthermore, if landlords do not receive sufficient funds to rebuild rental units, renters from the area are displaced.

Of course, receiving funds to relocate is better than receiving no assistance at all. But moving has costs in the form of lost social networks and employment opportunities. In some cases, flood victims may even relocate to areas of equal or worse flood risk and social vulnerability, including higher levels of poverty.¹⁰⁹ What’s more, the distribution of FEMA aid may actually increase inequality. Individuals with more resources to begin with are better equipped to rebound from natural disasters and benefit from aid receipt. In addition to recouping their prestorm property holdings, wealthy individuals “may gain access to . . . new business prospects supported by federal recovery investments; low-interest loans; [and] significant payouts from public and private insurance policies.”¹¹⁰ For those on unstable financial footing before a storm hits, however, damage from flooding is “more likely to trigger financial liabilities as a result of experiencing an increased likelihood of losing one’s job; having to move; paying higher rents due

¹⁰⁵ See FEMA, *supra* note 12, at 65.

¹⁰⁶ 44 C.F.R. § 59.1.

¹⁰⁷ A.R. Siders, *Social Justice Implications of US Managed Retreat Buyout Programs*, 152 CLIMATIC CHANGE 239, 249 (2018).

¹⁰⁸ *Id.*

¹⁰⁹ Devon McGhee, *Were the Post-Sandy Staten Island Buyouts Successful in Reducing National Vulnerability?* 31–34 (Apr. 28, 2017) (master’s project) (on file with Duke University Libraries).

¹¹⁰ Junia Howell & James R. Elliott, *Damages Done: The Longitudinal Impacts of Natural Hazards on Wealth Inequality in the United States*, 66 SOC. PROBS. 448, 452 (2019).

to reduced housing stock; and, dipping into already meager savings to compensate for such expenses.”¹¹¹

Federal flood-relief programs provide an essential lifeline to vulnerable communities. Yet this evidence suggests that they do little to fix, and may in fact worsen, underlying social vulnerabilities to natural disasters. FEMA’s funding programs thus conflict with the agency’s statutory mandate to “alleviate the suffering and damage which result from [] disasters.”¹¹² The next Part considers whether disparate outcomes resulting from FEMA’s use of CBA may be successfully challenged in court.

IV. LEGAL CHALLENGES TO FEMA’S COST-BENEFIT METHODOLOGY

Challenging the disparities that result from FEMA’s use of CBA in court could benefit vulnerable homeowners and place pressure on the agency to alter its methodology. The basic claim would be that conditioning funding for flood-mitigation projects on a cost-benefit ratio that relies primarily on property value has a disparate impact on low-income residents or racial minorities, who are more likely to possess (or rent) low-value homes. This Part considers whether this claim could succeed under the Stafford Act’s nondiscrimination provision, the Administrative Procedure Act¹¹³ (APA), or the Fair Housing Act¹¹⁴ (FHA), all of which have been used to challenge federal flood programs in the past. Ultimately, succeeding on any of these claims is unlikely, highlighting the lack of legal remedies for facially neutral policies that compound longstanding inequities in resources and capacity.

¹¹¹ *Id.* (citations omitted) (first citing James R. Elliott & Jeremy Pais, *Race, Class, and Hurricane Katrina: Social Differences in Human Response to Disaster*, 35 SOC. SCI. RSCH. 295 (2006); then citing James R. Elliott & Junia Howell, *Beyond Disasters: A Longitudinal Analysis of Natural Hazards’ Unequal Impacts on Residential Instability*, 95 SOC. FORCE 1181 (2017); and then citing Jacob Vigdor, *The Economic Aftermath of Hurricane Katrina*, 22 J. ECON. PERSPS. 134 (2008)). White residents in counties receiving more FEMA aid between 1999 and 2013 accumulated up to \$55,000 more wealth postdisaster than comparable white individuals in counties receiving less aid. On the other hand, Black and Latino individuals living in counties that received more aid accumulated \$82,000 and \$65,000 less in wealth, respectively, than comparable Black and Latino residents living in counties receiving less aid. *Id.* at 461.

¹¹² 42 U.S.C. § 5121(b).

¹¹³ Pub. L. No. 79-404, 60 Stat. 237 (codified as amended in scattered sections of 5 U.S.C.).

¹¹⁴ Pub. L. No. 90-284, 82 Stat. 81 (codified as amended at 42 U.S.C. §§ 3601–3619).

A. Litigating Under the Stafford Act's Nondiscrimination Provision

One initially promising avenue for challenging disparate impacts resulting from FEMA's implementation of CBA is the Stafford Act's nondiscrimination provision.¹¹⁵ The Stafford Act mandates that any regulations implementing disaster programs "include provisions for insuring that the distribution of supplies, the processing of applications, and other relief and assistance activities shall be accomplished in an equitable and impartial manner, without discrimination on the grounds of race, color, religion, nationality, sex, age, disability, English proficiency, or economic status."¹¹⁶ On its face, the nondiscrimination provision offers more protection than existing Fourteenth Amendment or Title VI¹¹⁷ doctrine because it includes economic status as a protected group. This may offer homeowners an opportunity to challenge FEMA's funding decisions on the basis of economic-status discrimination if they were denied mitigation funding due to a low benefit-cost ratio.

However, while courts have recognized a private cause of action under the Stafford Act's nondiscrimination provision,¹¹⁸ no plaintiff has yet brought a successful claim.¹¹⁹ This is in large part because courts have required a showing of discriminatory intent on the part of FEMA.¹²⁰ For instance, the Eastern District of Louisiana dismissed an allegation that FEMA's slow processing of applications for housing and rental assistance and its promulgation of eligibility rules constituted economic-status discrimination.¹²¹ The court found no evidence of impermissible discrimination.¹²² Instead, it determined that any disparities in

¹¹⁵ See Hannah Perls, Note, *U.S. Disaster Displacement in the Era of Climate Change: Discrimination & Consultation Under the Stafford Act*, 44 HARV. ENV'T L. REV. 511, 540–43 (2020).

¹¹⁶ 42 U.S.C. § 5151(a).

¹¹⁷ 42 U.S.C. §§ 2000d to 2000d–7. Title VI states that "[n]o person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." 42 U.S.C. § 2000d.

¹¹⁸ See *Laday v. Ramada Plaza Hotel Laguardia*, No. 07-CV-0450, 2007 WL 526613, at *2 (E.D.N.Y. Feb. 13, 2007); see also *Graham v. FEMA*, 149 F.3d 997, 1004–05 (9th Cir. 1998).

¹¹⁹ Perls, *supra* note 115, at 540.

¹²⁰ *Id.*

¹²¹ *McWaters v. FEMA*, 436 F. Supp. 2d 802, 823–24 (E.D. La. 2006).

¹²² *Id.* at 824. The court's statement that evidence of "discriminatory animus" would clearly violate § 5151(a), *id.*, and the absence of any discussion of disparate impact suggests that the court assumed intent was required.

funding resulted from FEMA's administrative inefficiencies and the fact that "inevitably those with economic resources will recover more quickly than those without."¹²³ Other courts have dismissed claims for failing to show that FEMA acted with discriminatory intent in denying applications for housing benefits¹²⁴ and disaster unemployment benefits.¹²⁵ These analyses are consistent with a general approach in U.S. antidiscrimination law that holds agencies accountable for unequal treatment but not unequal outcomes. Ultimately, it would be difficult to demonstrate discriminatory intent in the administration of HMA funds pursuant to FEMA's cost-benefit methodology given that CBA is oriented toward minimizing the costs to government rather than explicitly exclusionary goals.

B. Challenging FEMA Guidance Under the Administrative Procedure Act

Alternatively, plaintiffs could challenge FEMA's promulgation of the cost-benefit guidance under the APA.¹²⁶ The APA permits judicial review of federal agency action unless a statute precludes review or the action "is committed to agency discretion by law."¹²⁷ Unfortunately for any plaintiff wishing to challenge FEMA, the Stafford Act falls within this exception. The statute expressly provides that "[t]he Federal Government shall not be liable for any claim based upon the exercise or performance of or the failure to exercise or perform a discretionary function or duty."¹²⁸ Courts have found this provision "to preclude judicial review of all disaster relief claims based upon the discretionary actions of federal employees."¹²⁹ This leaves the agency open to suit only for nondiscretionary actions or constitutional violations.¹³⁰

¹²³ *Id.*

¹²⁴ *Laday*, 2007 WL 526613, at *2–3.

¹²⁵ *Maleche v. Solis*, 692 F. Supp. 2d 679, 693 (S.D. Tex. 2010).

¹²⁶ *See* Perls, *supra* note 115, at 542. Such a claim could perhaps allege that FEMA's guidance for conducting CBA is "an improper interpretation" of the Stafford Act and its implementing regulations. *See Rosas v. Brock*, 826 F.2d 1004, 1008–09 (11th Cir. 1987) (challenging a rule defining eligibility for disaster unemployment benefits as inconsistent with the relevant federal regulations).

¹²⁷ 5 U.S.C. § 701(a)(2).

¹²⁸ 42 U.S.C. § 5148.

¹²⁹ *See, e.g., Rosas*, 826 F.2d at 1008.

¹³⁰ *McWaters*, 436 F. Supp. 2d at 813; *Rosas*, 826 F.2d at 1008 ("There is no reason to believe that Congress ever intended to commit to an agency's discretion the question of whether or not to act constitutionally."); *Lockett v. FEMA*, 836 F. Supp. 847, 854–55 (S.D. Fla. 1993) (holding that a court had jurisdiction over a due process claim as well as a

Courts have generally found funding decisions under the Stafford Act to be nonreviewable discretionary acts. For instance, the D.C. Circuit held that FEMA's promulgation of regulations to carry out the postflood individual assistance program under the Stafford Act was a discretionary function.¹³¹ In so doing, the court considered whether the promulgation of the regulations involved "an element of judgment or choice," and whether the agency's "judgment is of the kind that the discretionary function was designed to shield."¹³² Under this test, agency actions are nondiscretionary "when a federal statute, regulation, or policy specifically prescribes a course of action for an employee to follow."¹³³ The D.C. Circuit concluded that FEMA's promulgation of regulations that specified "criteria, standards, and procedures for determining eligibility for assistance" were actions that relied on FEMA's "discretionary judgment" and permitted a wide "range of choice."¹³⁴ Therefore, judicial review was precluded. Other courts have similarly found that the promulgation of rules establishing eligibility for disaster unemployment benefits,¹³⁵ rules dictating how to calculate postflood reimbursements,¹³⁶ and individual decisions regarding whether to fund postdisaster relief are discretionary acts.¹³⁷

These cases suggest that agencies given broad latitude to implement statutory and regulatory language are insulated from judicial review. The "cost-effective" language in the Stafford Act is likely to be considered such discretionary language, rendering

nondiscrimination claim that implicated a due process right but not over a discretionary decision to award funding).

¹³¹ *Barbosa v. U.S. Dep't Homeland Sec.*, 916 F.3d 1068, 1073 (D.C. Cir. 2019).

¹³² *Id.* (quotation marks omitted) (quoting *United States v. Gaubert*, 499 U.S. 315, 322–23 (1991)).

¹³³ *Berkovitz v. United States*, 486 U.S. 531, 536 (1988).

¹³⁴ *Barbosa*, 916 F.3d at 1070, 1073 (quotation marks omitted) (quoting 42 U.S.C. § 5174(j)).

¹³⁵ *Rosas*, 826 F.2d at 1009 & n.3 (holding that where the statute did not "contain any guidelines for determining which workers are eligible for [unemployment] benefits and which are not," a rule defining an "unemployed worker" was "exactly the sort of exercise of discretion that Congress intended to insulate from judicial review" (quoting 20 C.F.R. § 625.2(s))).

¹³⁶ *Columbus Reg'l Hosp. v. FEMA*, 708 F.3d 893, 897–900 (7th Cir. 2013) (holding that a decision to calculate payments based on depreciated value of equipment was discretionary given the lack of language mandating that the replacement value be used).

¹³⁷ *St. Tammany Parish ex rel. Davis v. FEMA*, 556 F.3d 307, 323–24 (5th Cir. 2009) (holding that FEMA's decision not to dredge a canal was discretionary because language stating that the federal government "may" and "is authorized" to provide assistance did not create a mandatory funding obligation (emphasis omitted) (quoting 42 U.S.C. §§ 5170b(a), 5173(a))).

FEMA's development of its cost-benefit guidance unreviewable. The various sections of the Stafford Act authorizing the HMA programs specify criteria for eligibility. Some of this language is nondiscretionary. For instance, the section authorizing the BRIC program specifies that "the President shall provide financial assistance only in States that have received a major disaster declaration in the previous 7 years," indicating that FEMA would be subject to review if it did not comply with this particular requirement.¹³⁸ The same section, however, provides that the president shall "take into account" other factors, including "the extent to which prioritized, cost-effective mitigation activities . . . are clearly identified."¹³⁹ It does not dictate how cost-effectiveness should be evaluated, nor what weight it should be given relative to the other factors. Unlike the major-disaster requirement, this open-ended language suggests that FEMA has the discretion to develop rules and policies implementing the cost-effectiveness factor as it sees fit.

The regulations implementing the FMA Program are more stringent. To be eligible for funding under this program, a project must meet the cost-effectiveness requirement, meaning that it will "not cost[] more than the anticipated value of the reduction in both direct damages and subsequent negative impacts to the area if future floods were to occur."¹⁴⁰ The implementing regulations for the HMGP share the same language.¹⁴¹ Finally, the BRIC program requires that applicants' projects "have a benefit-cost ratio (BCR) of 1.0 or greater" such that they "reduc[e] risk and future disaster costs in excess of the cost of mitigation."¹⁴² While these regulations do specify that benefits must outweigh costs, even this leaves the specific costs and benefits to be considered undefined, suggesting that FEMA has discretion to include and exclude categories without being subject to judicial review. Ultimately, a judicial challenge to FEMA's cost-benefit methodology under the APA is likely to fail in the face of this discretionary function exception. However, the indeterminacy of the statutory and regulatory language also offers opportunities to advance redistributive goals by recategorizing what counts as a cost or a benefit, as Part V.A will describe.

¹³⁸ 42 U.S.C. § 5133(g).

¹³⁹ 42 U.S.C. § 5133(g).

¹⁴⁰ 44 C.F.R. § 78.11(a).

¹⁴¹ 44 C.F.R. § 206.434(c)(5)(ii).

¹⁴² FEMA, *supra* note 65, at 3.

C. Bringing a Disparate-Impact Claim Under the Fair Housing Act

Given the difficulty of challenging FEMA's funding decisions or regulations directly, it is worth considering an alternative pathway into court—challenging the state or local entity that submits projects to FEMA and ultimately distributes the funds. The FHA offers an attractive avenue for litigation against these entities because it allows for disparate-impact claims.¹⁴³ Indeed, the FHA has been used at least once to challenge disparate impacts resulting from a flood-recovery funding formula.¹⁴⁴ However, unlike the Stafford Act's nondiscrimination provision, the FHA only covers discrimination on the basis of “race, color, religion, sex, familial status, [] national origin,” or disability—not economic status.¹⁴⁵ Furthermore, the difficulty of demonstrating a statistical disparity in mitigation funding and the expansive defenses available under current law ultimately make this a difficult claim to bring.

Courts have applied two provisions of the FHA to flood-related claims. Section 3604(a) makes it illegal to “make unavailable or deny” housing on the basis of a protected characteristic.¹⁴⁶ This language has been interpreted to require a showing of “constructive eviction.”¹⁴⁷ Generally, this means that the plaintiff must show that the “residence is ‘unfit for occupancy’” and that they were “compelled to leave.”¹⁴⁸ The D.C. Circuit, in *Greater New Orleans Fair Housing Action Center v. U.S. Department of Housing and Urban Development*,¹⁴⁹ recognized a claim under this provision, alleging that a flood recovery grant formula developed by the state of Louisiana and the U.S. Department of Housing and Urban Development (HUD) allocated disproportionately fewer funds to Black homeowners than white homeowners after Hurricane Katrina.¹⁵⁰ The District Court concluded that § 3604(a) applied in

¹⁴³ *Tex. Dep't Hous. & Cmty. Affs. v. Inclusive Cmty. Project, Inc.* 576 U.S. 519, 545 (2015) (“The Court holds that disparate-impact claims are cognizable under the Fair Housing Act.”).

¹⁴⁴ *See Greater New Orleans Fair Hous. Action Ctr. v. HUD*, 639 F.3d 1078, 1081 (D.C. Cir. 2011).

¹⁴⁵ 42 U.S.C. § 3604(a).

¹⁴⁶ 42 U.S.C. § 3604(a).

¹⁴⁷ *Bloch v. Frischolz*, 587 F.3d 771, 776 (7th Cir. 2009).

¹⁴⁸ *Id.* at 777 (quotation marks omitted) (quoting *Constructive Eviction*, BLACK'S LAW DICTIONARY 594 (8th ed. 2004)). “[M]ere diminution in property values” is insufficient. *Id.*

¹⁴⁹ 639 F.3d 1078 (D.C. Cir. 2011).

¹⁵⁰ *Id.* at 1086. The grants were administered under HUD's Community Development Block Grant program. *Id.* at 1080.

this case because the funding formula made it impossible for “homeowners to inhabit their houses” by denying them sufficient funds to rebuild.¹⁵¹ The D.C. Circuit analyzed the claims without calling into question the appropriateness of using § 3604(a) to challenge funding decisions.¹⁵² Therefore, while § 3604(a) may be applicable to funding formulas in the mitigation context, it would only apply in the situation that a home was rendered *uninhabitable* by lack of mitigation infrastructure. This could be the case where homes are severely damaged or completely destroyed by floodwaters that would have been contained by a drainage channel or seawall. Because a lack of adequate mitigation may result in substantial harm that does not rise to the level of total destruction, however, the constructive-eviction requirement may limit the circumstances in which this provision applies. Furthermore, the funding at issue in *Greater New Orleans* was intended for repair efforts after a storm had hit, making it easier for a homeowner to claim that the failure to receive funds was a cause of their inability to return home. Mitigation funding, on the other hand, is preventive in nature, making it more difficult for plaintiffs to trace past funding decisions to the destructive effects of later storms.

In addition to the “make unavailable” provision, courts have also applied § 3604(b) in the flood-infrastructure context. This section prohibits discrimination “in the provision of services or facilities” connected to housing.¹⁵³ Courts have interpreted § 3604(b) to extend to the discriminatory provision of municipal services,¹⁵⁴ including the failure to provide adequate flood protection to minority neighborhoods.¹⁵⁵ A cost-benefit formula that disproportionately allocates funding for flood infrastructure to

¹⁵¹ *Greater New Orleans Fair Hous. Action Ctr. v. U.S. Dep’t Hous. & Urb. Dev.*, 723 F. Supp. 2d 14, 23 (D.D.C. 2010), *aff’d in part and rev’d in part*, 639 F.3d 1078 (D.C. Cir. 2011). The court inferred that the plaintiffs were unable to live in their homes based on the “devastating effects of Hurricanes Katrina and Rita” and the fact that only those whose homes were destroyed or significantly damaged were eligible for funds. *Id.* at 23 n.13.

¹⁵² See *Greater New Orleans*, 639 F.3d at 1085.

¹⁵³ 42 U.S.C. § 3604(b).

¹⁵⁴ See Robert G. Schwemm, Cox, Halprin, and *Discriminatory Municipal Services Under the Fair Housing Act*, 41 IND. L. REV. 717, 721 (2008) (noting that “[m]unicipalities have always been understood to be proper defendants under the FHA”).

¹⁵⁵ *Lopez v. City of Dallas*, No. 3:03-CV-2223-M, 2004 WL 2026804, at *8–9 (N.D. Tex. Sept. 9, 2004) (denying a motion to dismiss a § 3604(b) claim related to the discriminatory provision of flood protection and stormwater-drainage facilities, among other services, based on the race of homeowners); *Miller v. City of Dallas*, No. 3:98-CV-2955-D, 2002 WL 230834, at *14 (N.D. Tex. Feb. 14, 2002) (concluding that plaintiffs’ § 3604(b) claim—related to discriminatory provision of flood protection, streets, and drainage to a Black neighborhood—could proceed).

white neighborhoods, therefore, could plausibly constitute a § 3604(b) claim. This type of claim would perhaps be more advantageous than a claim brought under § 3604(a) because plaintiffs could seek preemptive relief without needing to meet the high bar of constructive eviction. Because this provision addresses the unequal allocation of resources rather than the availability of housing, it would likely apply to cases where homes are merely placed at greater risk of destruction due to a lack of infrastructure investment. Focusing on the ex ante provision of services avoids the difficulty of having to trace a causal link between past funding decisions and the damage resulting from storms.

To succeed on a disparate-impact claim under either of these provisions, a plaintiff would need to prevail under the three-step burden-shifting test set out in *Texas Department of Housing and Community Affairs v. Inclusive Communities Project, Inc.*,¹⁵⁶ which was codified in a HUD rule in 2020.¹⁵⁷ Under this test, plaintiffs must allege the existence of a policy or practice that directly causes “a disproportionately adverse effect on members of a protected class.”¹⁵⁸ If the defendant demonstrates that the policy “advances a valid interest,” the plaintiff may nevertheless prevail by showing that these interests could be promoted through a less discriminatory alternative.¹⁵⁹

The defendant may also escape liability by demonstrating that the policy “was reasonably necessary to comply with a third-party requirement,” such as federal, state, or local law; “[b]inding or controlling” court and administrative orders; or “[b]inding or controlling regulatory, administrative or government guidance or requirement.”¹⁶⁰ The existence of this defense makes it unlikely that a plaintiff could hold a local entity accountable simply for requiring that project applicants comport with FEMA’s cost-benefit

¹⁵⁶ 576 U.S. 519 (2015).

¹⁵⁷ HUD’s Implementation of the Fair Housing Act’s Disparate Impact Standard, 85 Fed. Reg. 60,288, 60,288 (Sept. 24, 2020) (to be codified at 24 C.F.R. § 100.500). President Biden issued a memorandum ordering the secretary of HUD to “examine the effects” that this rule has had on the implementation of the Fair Housing Act. Joseph R. Biden, Jr., *Memorandum on Redressing Our Nation’s and the Federal Government’s History of Discriminatory Housing Practices and Policies*, WHITE HOUSE (Jan. 26, 2021), <https://perma.cc/ZS2K-BW7C>. The review might lead to less stringent standards for bringing disparate-impact claims in the future.

¹⁵⁸ Disparate Impact Standard, 24 C.F.R. § 100.500(b)(2) (2021); see also *Inclusive Cmty.*, 576 U.S. at 543 (noting that the plaintiff must differentiate between the effect of the policy and the “multiple factors that go into investment decisions”).

¹⁵⁹ 24 C.F.R. § 100.500(c)(2)–(3); see also *Inclusive Cmty.*, 576 U.S. at 527.

¹⁶⁰ 24 C.F.R. § 100.500(d).

methodology.¹⁶¹ However, were a state or local entity to impose its own requirements for distributing funds, perhaps as a mechanism for prioritizing projects before they are even submitted to FEMA, there might be a stronger case for holding the local entity liable.

Even if the third-party-requirement defense were unavailable, establishing a statistical disparity caused by the cost-benefit methodology would be a daunting task. Indeed, the homeowners in *Greater New Orleans* failed on this point. The plaintiffs had alleged that a grant formula that awarded applicants the lesser of the pre-Katrina value of their home and the cost to rebuild “ha[d] a discriminatory impact on African-American grantees living in historically segregated communities.”¹⁶² This was because “generally African-Americans own homes with pre-storm values that fall below the cost to rebuild, while whites living in predominantly white communities own comparable homes with pre-storm values that exceed the cost to rebuild.”¹⁶³ To establish a prima facie case, the plaintiffs relied on a study that demonstrated that Black homeowners faced a larger “resource gap” than white homeowners due in large part to the use of the applicant’s home value as a ceiling on grant payout.¹⁶⁴

While evidence supported the claim that Black homeowners were likely to have lower home values and therefore receive smaller grants, the court dismissed the choice of the “resource gap” metric for two reasons. First, the court stated that the plaintiffs should have considered whether the disparity in property value was counterbalanced by other provisions in the grant formula—namely, that white applicants were more likely to see their grant size reduced by their higher insurance payouts.¹⁶⁵ Second, the court held that the plaintiffs erred in focusing only on the applicants within New Orleans, who might not be representative of all grant program applicants throughout Louisiana.¹⁶⁶ Ultimately,

¹⁶¹ However, the fact that FEMA’s methodology is designed in accordance with *Circular A-94*, which itself is not binding on administrative agencies, might mean that its methodology does not fall within this exception.

¹⁶² *Greater New Orleans*, 639 F.3d at 1089 (Rogers, J., concurring in part).

¹⁶³ *Id.*

¹⁶⁴ *Id.* at 1081 (majority opinion). The plaintiffs defined the “resource gap” as the cost of rebuilding minus the total resources available for rebuilding, including insurance payouts and FEMA grants.

¹⁶⁵ *Id.* at 1086.

¹⁶⁶ *Id.* at 1086–87.

the court concluded that the plaintiffs had not sufficiently established the existence of a disparate impact.¹⁶⁷

Greater New Orleans demonstrates the difficulty of prevailing under a disparate-impact theory under current case law. A plaintiff could feasibly demonstrate that FEMA's cost-benefit criterion leads to disproportionately fewer mitigation projects being constructed in primarily Black neighborhoods. Homes in majority-Black neighborhoods are valued at about half the price of homes in neighborhoods with no Black residents.¹⁶⁸ Based on the findings in Part III.B, low property values mean that Black neighborhoods likely receive fewer infrastructure investments, though residents may be more likely to receive property buyouts. The D.C. Circuit concluded that the deduction of insurance payouts from white recipients' grant totals counterbalanced the lower market values that Black recipients' grants were based on. Following similar logic, a court could conclude that the existence of the buyout option constitutes a "compensating factor" negating the disparity in infrastructure investment, even if recipients of buyout funds might prefer to stay within their communities. Additionally, a plaintiff may have a difficult time demonstrating that there is a "robust causal link" between the use of CBA to award flood-mitigation funds and disparities in flood protection, as required under *Inclusive Communities* and the HUD Guidance.¹⁶⁹ For instance, a defendant municipality might argue that racial disparities in flood-risk exposure are caused in part by self-selection of Black residents into more affordable—and flood-prone—neighborhoods. It may be difficult to disentangle the impact of the CBA policy from other factors that contribute to racially segregated risk exposure.

Finally, current HUD guidance allows defendants in a disparate-impact case to demonstrate that their policy "advances a valid interest," which may be rebutted on the showing that this interest could be promoted through a less discriminatory alternative.¹⁷⁰ A municipality would likely contend that its policy of protecting high-value properties is warranted by the "valid interest" of preserving the local tax base. However, this argument might be less convincing were a court to view the purpose of flood-mitigation programs as reducing the human suffering associated with

¹⁶⁷ *Greater New Orleans*, 639 F.3d at 1088.

¹⁶⁸ ANDRE PERRY, JONATHAN ROTHWELL & DAVID HARSHBARGER, *THE DEVALUATION OF ASSETS IN BLACK NEIGHBORHOODS: THE CASE OF RESIDENTIAL PROPERTY 11* (2018).

¹⁶⁹ 24 C.F.R. § 100.500(b)(3); *see also Inclusive Cmty.*, 576 U.S. at 542.

¹⁷⁰ 24 C.F.R. § 100.500(e)(2)–(3); *see also Inclusive Cmty.*, 576 U.S. at 527.

flooding in addition to protecting property holdings. Additionally, a plaintiff could contend that incorporating social vulnerability into CBA is at least “equally [as] effective”¹⁷¹ as the current methodology because it more accurately captures real costs to the government that are currently going uncounted. Taking into account social vulnerability need not impose “materially greater costs”¹⁷² than CBA as currently conducted. For instance, adopting an approach like Harris County’s weighting of social vulnerability would not necessarily require expensive data collection or calculations, given the existence of data sources like the SVI.¹⁷³ Ultimately, the success of a disparate-impact claim may depend on how stringently the requirements of *Inclusive Communities* and the HUD rule are enforced.

This Part has considered three potential avenues for challenging the distribution of flood-mitigation funding via the courts. Ultimately, however, altering FEMA’s cost-benefit policy directly is a more desirable way of incorporating distributional considerations into flood-mitigation programs for several reasons. First, altering FEMA’s methodology provides a comprehensive solution whereas litigation is piecemeal. Second, it offers benefits to those who may lack the income or willingness to go to court. And third, it forces FEMA to better address aspects of social vulnerability that are not protected under antidiscrimination law, including language, rental status, access to and trust in government, and income. The next Part examines several such improvements that could be made.

V. IMPROVEMENTS TO THE COST-BENEFIT ANALYSIS METHODOLOGY

The previous Part determined that courts are unlikely to offer relief to those who have failed to qualify for access to FEMA’s flood-mitigation funds. This Part proposes that policy change is a more promising avenue, especially given a renewed focus at the federal level on incorporating equity considerations into regulatory decision-making.¹⁷⁴ While some have advocated for doing away with CBA altogether,¹⁷⁵ CBA offers the advantages of

¹⁷¹ 24 C.F.R. § 100.500(c)(3).

¹⁷² 24 C.F.R. § 100.500(c)(3).

¹⁷³ See CTRS. FOR DISEASE CONTROL & PREVENTION, *supra* note 7.

¹⁷⁴ See Biden, *supra* note 28.

¹⁷⁵ See, e.g., David M. Driesen, *Distributing the Costs of Environmental, Health, and Safety Protection: The Feasibility Principle, Cost-Benefit Analysis, and Regulatory Reform*,

transparency, accountability, and direct comparison of alternatives.¹⁷⁶ Furthermore, CBA is so entrenched in the federal government's approach toward regulation that adjusting the existing framework is likely the most politically feasible path forward. This is especially true as climate change increases the cost and frequency of natural disasters and the government resources available to respond stretch thin. Difficult choices about which areas ought to be protected lie ahead, and CBA offers a pragmatic approach to ranking the options.¹⁷⁷ Finally, as Part I noted, federal guidance already recommends the incorporation of distributive concerns in regulatory decision-making, guidance that has long gone unheeded. FEMA is therefore well-positioned to adopt one or more of the following solutions: (1) expanding the categories of benefits, (2) weighting costs and benefits to account for wealth effects, (3) implementing a multifactor analysis that considers distributional concerns, (4) integrating social vulnerability into long-term planning, and (5) providing support for those who must relocate. Each of these solutions could be implemented by adopting new interpretations of existing statutes and regulations or issuing new regulations.

A. Expanding the Bounds of Benefits

To better account for the social effects of flooding, FEMA should reconsider what counts as a benefit in its analysis of flood-mitigation projects. This solution would have the advantage of conforming to the existing language in the Stafford Act and its implementing regulations, which simply require that mitigation projects be "cost-effective" without specifying precisely which

32 B.C. ENV'T AFFS. L. REV. 1, 8, 66–94 (2005) (advocating for the feasibility principle as a superior means to CBA for taking into account the distribution of costs, at least in the context of technology-based regulation); Adler & Posner, *supra* note 38, at 168 (discussing risk-risk analysis and direct interpersonal welfare comparisons as potentially more costly alternatives); Bronsteen et al., *supra* note 41, at 1616–44 (proposing "well-being analysis" as an alternative that focuses on quality of life).

¹⁷⁶ See Adler & Posner, *supra* note 38, at 175.

¹⁷⁷ Of course, this does not preclude efforts to increase the quantity of resources available for widespread emergency planning. See, e.g., Martha C. Nussbaum, *The Costs of Tragedy: Some Moral Limits of Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1005, 1035 (2000):

[S]ome things are exceedingly costly at the present time because of past injustice, or corruption, or laziness. . . . So keeping our eyes on the costs should not be permitted to deter us from asking why something that seems quite important is, or has become, terribly costly: who has put the costs up so high?

benefits and costs may or must be considered.¹⁷⁸ In fact, the regulations implementing the HMGP specify that projects must both be cost-effective *and* “substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster.”¹⁷⁹ This language suggests that considering longer-term, indirect effects may be appropriate and that both physical damages and less-tangible individual hardships may be incorporated.

In fact, FEMA has previously expanded its methodology to account for new benefits. Generally, FEMA only considers the value of averted property damage, loss of use of public facilities and infrastructure, fatalities or injuries, shelter for displaced persons, lost business income, and emergency costs like debris removal.¹⁸⁰ However, for some projects where benefits fall just short of costs using these traditional metrics, FEMA allows applicants to add certain social and environmental benefits to their tally in order to push the project over the cost-effectiveness threshold.¹⁸¹ Social benefits include the avoided mental stress, anxiety, and lost productivity that would otherwise result from flooding.¹⁸² Environmental benefits quantify the value of protecting and restoring natural habitats, including aesthetic improvements, air and water quality, and recreation and tourism.¹⁸³

While these categories are narrowly defined, they demonstrate FEMA’s willingness to expand its evaluation of project outcomes beyond physical harm alone. In fact, in the first round of funding under the BRIC program, FEMA encouraged applicants to include “ancillary benefits” such as “economic opportunity, reduced social vulnerability, cultural resources, public health, [and] mental health” in their applications.¹⁸⁴ These benefits are currently only considered after a project has already met the cost-effectiveness threshold based on the standard methodology.¹⁸⁵ FEMA could take this approach one step further by allowing a broader range of benefits to be counted within the formal CBA itself.

¹⁷⁸ See *supra* Part II.

¹⁷⁹ 44 C.F.R. § 206.434(c)(5).

¹⁸⁰ See FEMA, *supra* note 71, at 3-9 to 3-19.

¹⁸¹ *Id.* at 3-20.

¹⁸² *Id.* at 3-21. FEMA has assigned a value of \$2,443 per person for avoided mental stress and anxiety and \$8,736 per person for avoided lost wages. *Id.* at tbl.3.

¹⁸³ See FEMA, CONSIDERATION OF ENVIRONMENTAL BENEFITS IN THE EVALUATION OF ACQUISITION PROJECTS UNDER THE HAZARD MITIGATION ASSISTANCE (HMA) PROGRAMS 2 (2013). FEMA has assigned a yearly value, per acre, to green open space, riparian space, wetlands, forest, and marine and estuary space. FEMA, *supra* note 71, at 3-23.

¹⁸⁴ FEMA, BRIC QUALITATIVE CRITERIA 3–4 (2020).

¹⁸⁵ FEMA, *supra* note 65, at 7–8, 19.

As just three examples of potential benefits, FEMA could measure the value of unemployment services, homelessness services, and toxic-waste cleanup prevented by investing in flood infrastructure.¹⁸⁶ All three would better account for impacts to socially vulnerable populations than the current methodology, which disproportionately benefits those living in high-property-value areas. Wage workers who are temporarily dislocated after a storm may be more vulnerable to losing their jobs than salaried employees.¹⁸⁷ Were applicants for HMA grants allowed to measure the value of unemployment payouts prevented by protecting homes, this would add a larger boost than currently provided to projects in areas that have a high population of wage workers. Similarly, lower-income individuals are less likely to have insurance or savings and may be more vulnerable to homelessness following destructive storms, which may lead to additional burdens placed on other government services.¹⁸⁸ Were FEMA to incorporate the benefits of preventing storm-induced homelessness when evaluating a flood-mitigation project, projects protecting homes in lower-income areas would be more likely to qualify. Finally, flooding frequently leads to toxic spills from industrial sites, which are disproportionately located in low-income neighborhoods.¹⁸⁹ If CBA accounted for the remediation or health costs avoided by building flood infrastructure near industrial sites, these benefits would more likely accrue to lower-income neighborhoods.

Of course, selecting which benefits to include implicates difficult judgment calls about which social costs are most significant, and FEMA's ability to incorporate new variables may be limited by the data sources that it can access. However, if we accept that the social effects of flooding should be accounted for in addition to property damage and that FEMA's methodology currently undercounts these effects, then incorporating at least some new categories of benefits is likely to lead to an increase in investment in

¹⁸⁶ As a reminder, these would be counted as benefits under FEMA's methodology because benefits include costs avoided by investing in mitigation.

¹⁸⁷ Tierney, *supra* note 93, at 115. The Disaster Unemployment Assistance program currently offers benefits to those who have lost their job "as a direct result of a major disaster." Disaster Unemployment Assistance, BENEFITS.GOV, <https://perma.cc/XY5S-9TZM>.

¹⁸⁸ See, e.g., Jeremy Hobson, *How New Orleans Reduced Its Homelessness Population by 90 Percent*, WBUR (Feb. 19, 2019), <https://perma.cc/W4J5-PVCH> (describing the increase in homelessness following Hurricane Katrina and the costs associated with the criminal justice system and emergency medical care).

¹⁸⁹ Brie Sherwin, *After the Storm: The Importance of Acknowledging Environmental Justice in Sustainable Development and Disaster Preparedness*, 29 DUKE ENV'T L. & POL'Y F. 273, 283 (2019).

communities who are most vulnerable to flooding. This investment could ultimately reduce the long-term burdens on local and federal government to support individuals whose lives are significantly disrupted by a storm. Even if reducing monetary payouts by the government were the only end FEMA pursued via flood mitigation, paying more to protect socially vulnerable neighborhoods upfront may be cost-justified in the long run.

B. Altering the Weights Assigned to Costs and Benefits

As an alternative to including new categories of benefits within its CBA, FEMA could simply weigh the existing categories differently. Again, there is precedent for such an approach. In 2013, as one facet of FEMA's Climate Change Adaptation Policy,¹⁹⁰ the agency issued a new policy that permitted (but did not mandate) project applicants to incorporate sea level rise into their estimates of future flood damages.¹⁹¹ Previously, FEMA had projected the frequency and severity of flooding based on historical data, without accounting for the likelihood that climate change would worsen outcomes. By incorporating expected sea level rise into the flood-risk model, FEMA effectively applied a greater weight to the benefits of projects built in areas that were likely to see the greatest increase in climate change-induced flooding. Flood-mitigation interventions in these areas became more valuable as the likelihood and intensity of future storms increased.

FEMA could make an analogous adjustment by applying distributional weights when conducting CBA. This approach seeks to compensate for the fact that an additional dollar saved or lost produces a smaller welfare change for a rich person than for a poor person.¹⁹² Distributional weights counteract wealth effects by weighing benefits and costs experienced by lower-income individuals more heavily than those benefits and costs accruing to higher-income individuals.¹⁹³ Under ideal circumstances, this

¹⁹⁰ FEMA, ADMINISTRATOR POLICY, FEMA CLIMATE CHANGE ADAPTATION POLICY STATEMENT 2011-OPPA-01 (2012). FEMA's policy was itself influenced by President Obama's Executive Order on Climate Change. Exec. Order No. 13,514, 3 C.F.R. 248 (2010).

¹⁹¹ FEMA, INCORPORATING SEA LEVEL RISE (SLR) INTO HAZARD MITIGATION ASSISTANCE (HMA) BENEFIT COST-ANALYSIS FREQUENTLY ASKED QUESTIONS (FAQS) 2 (2013).

¹⁹² See, e.g., Bronsteen, *supra* note 41, at 1654. For an explanation of the use of distributional weights in CBA, see generally Matthew D. Adler, *Benefit-Cost Analysis and Distributional Weights: An Overview*, 10 REV. ENV'T ECON. & POL'Y 264 (2016).

¹⁹³ See, e.g., Jarl Kind, W.J. Wouter Botzen & Jeroen C.J.H. Aerts, *Accounting for Risk Aversion, Income Distribution and Social Welfare in Cost-Benefit Analysis for Flood Risk Management*, 8 WIREs CLIMATE CHANGE 1, 7 (2017) ("Methodologies to use equity

would require calculating the welfare each person receives from each additional dollar, a calculation that is analytically costly and for which there is currently no widely adopted method.¹⁹⁴ However, there are examples of distributional weights being put into action, and the idea is generating increasing support among both academics and policy makers.

For instance, FEMA could adopt the approach used by the British equivalent of OMB. The Treasury Department in the United Kingdom recommends the use of weights in its guidance document for evaluating regulatory actions (akin to Executive Order 12,886 in the United States).¹⁹⁵ This guidance recommends that for projects with large distributive effects, agencies divide the affected population into quintiles based on income and household size. Benefits and costs accruing to lower quintiles are weighted more heavily.¹⁹⁶ Given recent calls for distributional weights to be incorporated into climate policy in the United States,¹⁹⁷ it is feasible that a workable estimate for the marginal utility of money might be approved for regulatory analysis. If so, FEMA could apply a similar quintile-based method to weight the benefits of mitigation projects accruing to low-wealth areas more heavily. This would increase the likelihood that the investments in flood mitigation in low-income neighborhoods would be eligible for funding.

An alternative intervention with a basis in U.S. practice would be for FEMA to incorporate the subjective benefits of homeownership into property values. This approximates the goal of distributional weighting by attempting to measure the welfare benefits associated with property ownership. Currently, FEMA calculates the benefit of averted property damage based on the

weights in CBAs were developed and promoted in the past, including by organizations like the World Bank and the United Nations, where higher weights were assigned to cost and benefits for low income groups, and lower weights for high income groups.” (first citing R. Layard, G. Mayraz & S. Nickell, *The Marginal Utility of Income* 25 (CEP, Discussion Paper No. 784, 2007); and then citing PARTHA DASGUPTA, AMARTYA SEN & STEPHEN MARGLINE, GUIDELINES FOR PROJECT EVALUATION (1972)).

¹⁹⁴ Adler & Posner, *supra* note 38, at 193.

¹⁹⁵ H.M. TREASURY, THE GREEN BOOK: CENTRAL GOVERNMENT GUIDANCE ON APPRAISAL AND EVALUATION 9 (2020).

¹⁹⁶ *See id.* at 97–98. Empirical evidence suggests that the value of an additional unit of income is roughly halved as income doubles. *Id.* at 94–95.

¹⁹⁷ *See, e.g.*, Tamma Carleton & Michael Greenstone, *Updating the United States Government's Social Cost of Carbon* 30 (Energy Pol'y Inst. at Univ. of Chi., Working Paper No. 2021-04, 2021).

cost to rebuild.¹⁹⁸ However, this fails to differentiate between projects that protect primary residences and those that protect investment properties or secondary vacation homes, treating luxury or commodity housing as equivalent to shelter.¹⁹⁹ Literature on just compensation for takings has acknowledged the importance of valuing homeowners' subjective attachment to their homes,²⁰⁰ as well as the costs that property dispossession poses to personhood, autonomy,²⁰¹ and one's sense of community.²⁰² Indeed, the federal government offers "bonus" payments above the market value for properties relocated as part of federal programs to account for this subjective value.²⁰³ FEMA could therefore adjust its calculation of property value by adding subjective value to the cost of rebuilding. This could perhaps be scaled based on years of occupancy²⁰⁴ and would only be available for primary residences. Were FEMA to more heavily weight the benefits associated with protecting primary homes in this way, infrastructure investments that protect properties that are essential for well-being and shelter would be more likely to qualify for protection.

C. Transforming Cost-Benefit Analysis into a Multifactor Analysis

While both previous proposals collapsed distributive considerations into a single benefit-cost ratio, FEMA could also transform CBA into one component of a multifactor analysis. Considering CBA alongside other criteria is consistent with the language in the Stafford Act that provides that mitigation projects both be "cost-effective" and "substantially reduce the risk of, or increase resilience to, future damage, hardship, loss, or suffering in any area affected by a major disaster."²⁰⁵ This approach would involve considering the distributional implications of a policy alongside its overall efficiency gains. Most simply, FEMA could require that

¹⁹⁸ See FEMA, *supra* note 71, at 3-10.

¹⁹⁹ OFF. OF INSPECTOR GEN., *supra* note 54, at 13.

²⁰⁰ See, e.g., Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U. CHI. L. REV. 681, 736-37 (1973) (noting that market value fails to capture a homeowner's "experience in using [a] particular house and sentimental memories connected to it").

²⁰¹ Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957, 960 (1982).

²⁰² Ernest Norton Tooby, Note, *The Interest in Rootedness: Family Relocation and an Approach to Full Indemnity*, 21 STAN. L. REV. 801, 814-15 (1969).

²⁰³ See Ellickson, *supra* note 200, at 737 n.195.

²⁰⁴ *Id.* at 736-37.

²⁰⁵ 42 U.S.C. 5170c(a).

project applicants submit a qualitative description of the demographic characteristics of populations benefitting from a proposed project. This would align with *Circular A-94*, which states that “[w]hen benefits and costs have significant distributional effects, these effects should be analyzed and discussed, along with the analysis of net present value” of the proposed project.²⁰⁶

To add teeth to the distributional analysis, FEMA could make distribution of benefits a criterion for project evaluation, similar to the approach used in Harris County. As mentioned in the Introduction, Harris County has adopted a prioritization framework for distributing flood-mitigation funds that rates projects on a scale from one to ten across eight categories.²⁰⁷ The factors—including flood-risk reduction, project efficiency, and social vulnerability—are then weighted and summed into a composite score that is used to prioritize the order of construction.²⁰⁸

FEMA could easily replace its current method of conducting CBA with a composite score that incorporates the NRI factors, described in Part II.B. To evaluate the effectiveness of a project, FEMA could substitute the expected annual loss component of the NRI with FEMA’s current cost-benefit methodology. This value would then be added to the scores for social vulnerability and community resilience, with each assigned a weight according to its relative importance. In setting this weight, it would likely be important to facilitate public input on the relative priorities of different factors from affected residents. Rather than require that projects’ benefits strictly outweigh their costs, FEMA could instead set a threshold score that projects must reach in order to receive HMA funding.

There are many benefits to the multifactor approach. First, it encourages deliberation around the relative weight applied to economic efficiency and social vulnerability. Rather than attempting to collapse value judgments into a single monetized form, a

²⁰⁶ OFF. OF MGMT. & BUDGET, *supra* note 33, at 12. *Circular A-94* suggests analyzing distributional effects by grouping individuals or households by income, geographic region, or demographic group. *Id.*

²⁰⁷ Because these funds were raised via a 2018 bond measure, they are not subject to FEMA’s requirements unless they are used as matching funds.

²⁰⁸ *See generally* HARRIS CNTY. FLOOD CONTROL DIST., *supra* note 5. Flood-risk reduction is calculated as the number of structures removed from the floodplain as a result of the infrastructure project and is weighted most heavily (25% of the composite score). Project efficiency is defined as the total cost of the project divided by the number of structures benefited and is weighted as 10% of the total score. Social vulnerability is derived from “15 U.S. Census variables that influence a community’s ability to prepare for, respond to, and recover from a disaster” and is weighted at 20%. *Id.* at 4–6.

multifactor analysis makes clear the various value judgments at play. This increases the likelihood that members of the public can hold officials accountable for the trade-offs they make in deciding which areas to protect.²⁰⁹ Furthermore, highlighting distribution as a separate consideration in the decision-making process serves an expressive function by orienting social expectations around the distribution of resources in a more egalitarian direction.²¹⁰ Finally, the multifactor approach is supported by federal guidance under *Circular A-94*, which acknowledges that where policies are “intended to benefit a specified subgroup of the population,” the CBA “should consider how effective the policy is in reaching its targeted group.”²¹¹ Separately analyzing the impacts on socially vulnerable populations, rather than folding these into a single metric, is more consistent with this guidance. Compared to the first two solutions, which ensure that the output of CBA more accurately reflects welfare impacts of flood mitigation, a multifactor approach instead seeks to place less emphasis on CBA in the overall decision-making process.

D. Incorporating Distributional Considerations into Long-Term Planning

Given FEMA’s increased focus on long-term risk reduction, the agency might also consider requiring project applicants to develop mitigation plans for reducing social vulnerability. All project applicants to the three HMA programs are required to have a FEMA-approved mitigation plan in place to be eligible for funds.²¹² These plans must include a risk assessment that describes the natural hazards affecting a region and the region’s vulnerability to those hazards. Vulnerability is currently defined exclusively in terms of physical damage to buildings, infrastructure, and facilities located in hazardous areas.²¹³ Plans must also include a mitigation strategy to reduce these potential losses.²¹⁴ FEMA could therefore adjust its regulations to require that hazard mitigation plans more proactively address social vulnerabilities.

²⁰⁹ See Adler & Posner, *supra* note 38, at 193 n.80.

²¹⁰ See, e.g., Hanoch Dagan, *Takings and Distributive Justice*, 85 VA. L. REV. 741, 756 n.39 (1999).

²¹¹ OFF. OF MGMT. & BUDGET, *supra* note 33, at 12.

²¹² *Mitigation Planning and Grants*, FEMA (Oct. 16, 2020), <https://perma.cc/MP25-JF39>.

²¹³ 44 C.F.R. § 201.6(c)(2)(ii)(A)–(C).

²¹⁴ 44 C.F.R. § 201.6(c)(2)–(3).

To do this, FEMA could require applicants to utilize the NRI described above in completing their risk assessments. That is, project applicants would be required to assess not just the value of property at risk of flooding but also the social factors that influence an affected community's ability to respond. As a condition of funding, FEMA would require that applicants adopt mitigation strategies that prioritize investments in communities with the highest social vulnerability. As opposed to the permissive approaches laid out in Part V.A–C, which seek to increase the likelihood that applicants from high-vulnerability areas qualify for funds, this strategy mandates that all jurisdictions adopt a distributional focus. Therefore, it would likely be a less politically feasible option, assuming that there are strong vested interests in the allocation of funds to high-value areas.

Because state and local entities include lists of proposed projects when submitting their mitigation plans, FEMA might also expand the eligible geographic scope of what counts as a project. FEMA generally categorizes a mitigation project as a construction activity protecting properties within the same floodplain.²¹⁵ This means that projects are likely to be designed either at the building level or within a neighborhood that shares the same risk profile and similar property values. FEMA could instead require that applicants submit a portfolio of projects within a given jurisdiction and evaluate the cost-effectiveness of the entire lot. This would allow non-cost-effective investments in lower-value areas of a city or county to be “subsidized” by the benefits received from protecting higher-value areas. Approaching flood protection on a city- or countywide scale also makes sense when considering that flood damage in one neighborhood can diminish the overall tax base that supports municipal services for the entire jurisdiction. Therefore, distributing flood infrastructure more evenly may help sustain property values in a way that benefits the entire area. Of course, this approach is most likely to be utilized by municipalities that are independently motivated to redress inequities in funding. Unlike a solution that alters the CBA criterion for all applicants, the planning and prioritization approach requires municipalities to proactively adopt a focus on redistribution, which may not be politically tenable in all areas. Furthermore, states or municipalities could simply choose to include projects that fell

²¹⁵ FEMA, WHAT IS A BENEFIT? GUIDANCE ON BENEFIT-COST ANALYSIS OF HAZARD MITIGATION PROJECTS 1-1 (2001).

short of being cost-effective when evaluated on a project-level basis—but nevertheless already serve a relatively well-off community—in which case the potential for this method to reach highly vulnerable households would be underutilized. To the extent that some municipalities are currently frustrated by FEMA’s CBA criteria in their efforts to distribute flood funding more broadly, however, evaluating cost-effectiveness at the regional scale provides a path forward.

E. Reducing the Costs Associated with Displacement

Finally, FEMA should consider how to ensure that its buyout programs do not merely recreate patterns of unequal risk exposure. Continuing to invest in housing in flood-prone areas is not a long-term solution. Ultimately, buyout programs are the most cost-effective form of mitigation. Entire neighborhoods and cities will eventually need to move from the coast as rising tides make it impossible to effectively hold back flooding.²¹⁶ All three of the HMA programs currently fund property acquisitions. Acquisitions are subject to the same cost-effectiveness criteria as investments in mitigation infrastructure, though there is an exception for properties under \$250,000 and for those that are substantially damaged. As mentioned in Part III.B, lower-value homes are more likely to be considered “substantially damaged” and to become eligible for relocation, both because the property value is lower to begin with and because the lack of mitigation infrastructure in low-value neighborhoods increases the damage resulting from storms.²¹⁷ Yet lower-income households may be less able to relocate to safer neighborhoods if they lack the resources or knowledge to conduct widespread housing searches. They may also be able to afford to live only in equally flood-prone or low-opportunity areas. These relocation patterns are especially concerning given

²¹⁶ See, e.g., Christopher Flavelle, *U.S. Flood Strategy Shifts to ‘Unavoidable’ Relocation of Entire Neighborhoods*, N.Y. TIMES (Aug. 26, 2020), <https://perma.cc/JH2N-N832> (describing the shift toward funding large-scale buyouts of homes by state governments, FEMA, HUD, and the U.S. Army Corps of Engineers); Jeffrey Arnold, Roger Pulwarty, Robert Lempert, Kate Gordon, Katherine Greig, Cat Hawkins Hoffman, Dale Sands & Caitlin Werrell, *Reducing Risks Through Adaptation Actions*, in 2 IMPACTS, RISKS, AND ADAPTATION IN THE UNITED STATES: FOURTH NATIONAL CLIMATE ASSESSMENT (David Reidmiller et al. eds., 2018) (noting that “retreat will become an unavoidable option in some areas of the U.S. coastline”), <https://perma.cc/FZ3H-HYKK>.

²¹⁷ Siders, *supra* note 107, at 249.

recent research indicating the long-term effects that neighborhood quality has on lifetime earnings and well-being.²¹⁸

To ensure that its buyout programs do not perpetuate social vulnerability, FEMA could borrow a strategy from housing-voucher administration. Evidence from existing voucher programs suggests that the recipients of housing vouchers tend to remain in neighborhoods with low social mobility. However, the Seattle Housing Authority recently implemented a program that provided voucher recipients with personalized financial support and advice, including information on “opportunity bargain” neighborhoods that have low housing prices but high social mobility.²¹⁹ The counseling program produced a large increase in voucher holders who voluntarily moved to these higher-opportunity areas.²²⁰ FEMA might consider implementing similar measures. If lower-wealth households are forced to relocate rather than stay in place, they ought to be able to access affordable neighborhoods that are not subject to flood risk. This solution presents an opportunity for FEMA to proactively shape residential patterns such that patterns of concentrated vulnerability and inequality are not reinscribed.

CONCLUSION

As a changing climate increases the likelihood of extreme weather events, the federal government will play a larger and more costly role in helping communities recover from natural disasters. This Comment has highlighted how natural disasters expose and exacerbate existing social inequalities and how the use of seemingly neutral decision-making criteria can lead to disparate outcomes when operating on an unequal playing field. It has identified ways in which FEMA’s methodology—by conceptualizing risk in terms of property loss—fails to capture the potentially vast social harms caused by flooding. In failing to account for the long-term burdens to the government of supporting vulnerable communities when and after a storm hits, FEMA may actually fail to achieve its stated goal of cost-effectiveness.

²¹⁸ See Peter Bergman, Raj Chetty, Stefanie DeLuca, Nathaniel Hendren, Lawrence F. Katz & Christopher Palmer, *Creating Moves to Opportunity: Experimental Evidence on Barriers to Neighborhood Choice*, 6 (Nat’l Bureau of Econ. Rsch., Working Paper No. 26164, 2020) (predicting that “moves from low- to high-opportunity Census tracts induced by [the experiment] will increase average undiscounted lifetime household incomes by \$214,000 (8.4%) for children who move at birth and stay in their new neighborhoods throughout childhood”).

²¹⁹ *Id.* at 9.

²²⁰ *Id.* at 2–3.

Pursuing economic efficiency may also conflict with other important goals, such as fair and integrative access to housing or economic opportunity.

The solutions proposed here seek both to improve the distributive outcomes of flood-mitigation policy and to draw attention to the values that government agencies promote in their decision-making procedures. In this second goal, the solutions presented here are not limited to FEMA. While federal agencies continue to pursue economic efficiency without much regard for the distribution of policy burdens and benefits, this Comment proposes several ways in which agencies can better measure and promote equitable outcomes. How the government defines, weighs, and communicates the costs and benefits of its policies reveals where its priorities lie. While the federal government faces difficult trade-offs between the costs to taxpayers of greater federal involvement in flood mitigation and the effects of agency neglect on vulnerable communities, this Comment suggests that acknowledging the full social impacts of policies is an important step.

While mitigation resources ought to be apportioned equitably in the short-term, large-scale relocation is likely inevitable for most flood-prone communities over the coming decades. As in periods of massive demographic relocations that have come before, the government has a powerful role to play in structuring how communities and neighborhoods are resettled. Decisions on how to spend federal funding can disrupt patterns of income, wealth, and racial segregation and can create new opportunities for those previously denied wealth-building opportunities to establish firmer roots.