



What Role Does the Private Sector Have in Supporting Disaster Recovery, and What Challenges Does It Face in Doing So?

Anita Chandra, Shaela Moen, Clarissa Sellers

Disaster-recovery financing has become a critical topic in recent years, particularly as disaster frequency and intensity have changed and diversified. Declarations of natural, human-created, and technological disasters in the United States (and globally) have increased in the past decade. For example, from 2000 to 2014, the number of U.S. disaster declarations has increased dramatically—65 major declarations per year on average and a total of 1,907 declarations overall. And during the peak of such increases in 2011, the Federal Emergency Management Agency (FEMA) issued the largest number to date (90 major disaster declarations and 242 disaster declarations overall) (see FEMA, undated).

Both the public and private sectors play a role in disaster-recovery financing. Public-sector players include agencies at the federal level (such as the U.S. Department of Homeland Security

[DHS], U.S. Department of Housing and Urban Development, and U.S. Department of Health and Human Services) and the state and local levels (local departments of emergency management, a long-term recovery authority, or long-term recovery committees often led by a government agency) that respond in the wake of disasters. Private-sector contributors to disaster-recovery financing include two types of entities. First, there are for-profit businesses—both in the affected disaster areas and nationally. Businesses' ability to reopen and ensure few disruptions in payroll is most critical for economic recovery. Private nonprofits, such as philanthropies and charities, often raise money from private businesses and individuals to finance disaster recovery.

The public sector gets involved in disaster-recovery financing once there is a presidential declaration of an emergency or a declaration of a major disaster in general. FEMA (as part of DHS)

and other federal agencies are available to assist in dealing with the emergency or major disaster involved. Specifically, FEMA can distribute aid money from its Disaster Relief Fund. The fund covers public assistance, individual assistance, mitigation, and general operation and administrative costs. Public assistance provides aid to public (and certain private nonprofit) entities for specific emergency services and the repair or replacement of disaster-damaged public facilities, including debris removal, emergency protective measures, road systems and bridges, water-control facilities, public buildings and contents, public utilities, and parks. Individual assistance covers such programs as temporary housing, home repairs, and disaster case management. Mitigation services tend to cover the funding of long-term recovery, although this can vary by federal agency and type of service, from taking adaptation measures to providing complementary social and human services.

As for the role of the private sector, insurance companies obviously have a direct role—providing insurance coverage before a disaster and compensation for loss following one. But the private sector writ large has a broader role: A wide range of corporate and nonprofit organizations assist in disaster-relief activities, from partnering with community organizations to rebuild a neighborhood to providing immediate economic support for households and families. Nonprofits are also essential in providing direct services (e.g., housing support, health services, financial counseling) to affected constituents. But this broader role in disaster-recovery financing has been elevated for a couple of reasons. First, there is a keen recognition that a community cannot rely on a single source of funding to address the sheer magnitude of any one disaster, much less the potential overlap of emergencies in particularly disaster-prone areas. Second, disaster recovery requires collaboration and different

Yet, despite the elevated role for the private sector in disaster-recovery financing, there is still limited discussion about how and where the private sector should contribute, whether the processes are clear enough for when the private sector should engage, and whether there is any real clarity about whether the private-sector contributions will help to offset shortfalls as households and whole communities emerge from the disaster-recovery phase.

types of funding, much of which the private or nongovernmental sector can transfer or distribute more effectively than the government sector can.

Yet, despite the elevated role for the private sector in disaster-recovery financing, there is still limited discussion about how and where the private sector should contribute, whether the processes are clear enough for when the private sector should engage, and whether there is any real clarity about whether the private-sector contributions will help to offset shortfalls as households and whole communities emerge from the disaster-recovery phase.

Objectives and Approach

In this perspective, we discuss how the private sector is currently contributing in terms of supporting disaster-recovery financing,

what challenges it faces in doing so, and potential opportunity for future involvement. We then discuss some areas of inquiry to address those challenges going forward. For the purposes of this perspective, we examine the roles of both for-profit businesses and nonprofit private-sector organizations because both offer critical services in disaster recovery. We note where findings or themes are relevant for particular types of private-sector organizations.

We took a two-pronged approach in doing this review. First, we built on an *environmental scan*, which included a review of the peer-reviewed and gray literature (e.g., reports, proceedings), as well as other materials that summarize issues in disaster-recovery financing. For this perspective, we focus on the materials related to the role of the private sector in supporting individuals, households, businesses, and communities. In addition to the more formal review of peer-reviewed and gray literature, we extensively searched web material to gather information about large national disasters (e.g., Iowa floods, Colorado floods, Deepwater Horizon oil spill, Hurricane Sandy, Hurricane Katrina, Texas fertilizer explosion, 9/11). We also used Corporate Aid Tracker and charitable contribution databases to extract information on fiscal implications and dollars allocated for specific disasters or types of services. For each of these local examples, we examined whether there were program and policy proceedings, articles, organization reports (e.g., from long-term recovery committees), and other materials that could provide additional detail on the cost of recovery, the role of the private sector, and the issues in providing financial support to aid community rebuilding.

Second, we conducted *key-informant interviews* with key national and local stakeholders in various sectors of disaster response and recovery—particularly those with expertise in

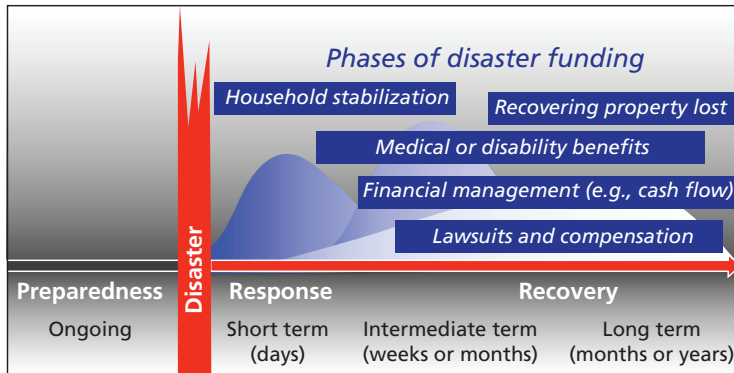
private-sector involvement, in risk management, and in navigating the systems involved in financing disaster recovery—to understand particular issues in disaster-recovery financing. To identify these key stakeholders, we first considered a combination of large-scale natural disasters (i.e., Hurricanes Katrina and Sandy, the floods in Colorado) and relatively recurrent disasters (i.e., the wildfires in California). We then reviewed our research findings to identify prominent players or entities in recovery efforts. We included local leaders from these communities, national leaders, and corporations (e.g., city managers; companies, including Wal-Mart, Target, and Bank of America; U.S. Chamber of Commerce; American Red Cross).

How Is the Private Sector Contributing to Disaster-Recovery Financing?

Informed by our analysis, we have determined that the private sector is contributing to disaster-recovery financing in a variety of ways, including playing a key role in early response and long-term recovery, collaborating with the public sector in public–private partnerships, driving innovation and facilitating technology use, helping smaller communities manage influxes of funds, and supplementing the federal disbursement processes. In this section, we discuss these contributions.

A typical disaster cycle (as shown in the figure) goes through a series of phases: the period of preparedness or preplanning, the response period (short term, measured in days), and the recovery period (intermediate term, measured in weeks or months, as well as long term, measured in months and years).

Phases of a Typical Disaster Cycle



RAND PE187-1

During these phases, there are significant financial activities and implications for both households and communities—activities that involve both the public and private sectors. The shortfalls at particular phases of response and recovery can be devastating and accumulate if not addressed swiftly. Typically, communities (local jurisdictions) go to state and federal governments for help. But it is unclear how the private sector should best be involved in the process. For example, as a disaster exceeds the bounds of what is covered in public-sector mechanisms, the private sector can be particularly useful in addressing gaps. Given existing assets and risk-bearing capacity, a community might be able to withstand only a certain amount of risk exposure and, as a result, must seek out private-sector help. For example, during the response phase, local financial supports might kick in from both the public and private sectors to help households stabilize and manage daily needs, but the private sector's cash reserves might be more flexible than government cash options.

As the recovery phase takes root, households might need to access medical or disability benefits as a result of injury. Depending on the seriousness of the disaster impact, these needs could exceed what health insurance usually covers or the traditional offerings of routine social services. Whether supports for medical, financial, or other impacts are available from philanthropic investment is an open question, but examples from recent disasters indicate that the private sector is now often addressing those shortfalls. During the recovery period, households can access a range of government-sponsored individual and case management assistance programs while communities begin to leverage rebuilding grants, such as resources from the Community Development Block Grant (CDBG) Disaster Recovery program.

During the recovery process, other potential funding mechanisms might kick in, such as additional support for home or community rebuilding or renovation and continued support to close gaps in general cash flow to meet basic household or community economic needs (e.g., keeping government agencies running). However, if households have difficulty overcoming existing vulnerabilities and the subsequent disaster effects, individuals might fall further behind, stressing a range of safety-net options and increasing the need for such supports as unemployment services.

Private-Sector Contributions to Preparedness

In this disaster cycle, the private sector plays a key role in preparedness, early response, and longer-term recovery. In terms of preparedness, businesses can help build resilience before a disaster

strikes, such as by driving local investment and strengthening general resilience. According to FEMA, 2011:

Businesses play a key role in building resilient communities. As businesses consider what they need to do to survive a disaster or emergency, as outlined in their business continuity plans, it is equally important that they also consider what their customers will need in order to survive. The ongoing involvement of businesses in preparedness activities paves the way to economic and social resilience within their communities. (p. 12)

In 2011, then–United Nations Special Representative of the Secretary-General for Disaster Risk Reduction Margareta Wahlström noted in a public statement, “A private sector committed to disaster risk reduction can steer public demand toward materials, systems, and technological solutions to build and run resilient communities” (United Nations Office for Disaster Risk Reduction, 2011). DHS, 2008, notes ways in which business can support making communities safer: setting standards and quality assurance criteria for safer structures in urban areas, as well as providing expertise to help with administration, internal business processes, and external disaster risk assessments.

As part of such resilience efforts, companies are extending the reach of their emergency preparedness, response, and recovery activities to include employees, family members, and other constituents. For example, Office Depot is using its foundation to educate small businesses about emergency preparedness, Shell Oil Company has provided support for disaster victims in need of fuel to address key needs during recovery, and Wal-Mart uses its website to promote preparedness among employees and to post tips for specific areas and shelter or disaster information.

As another example, IBM has focused on long-term resilience by creating Smarter Cities Challenge grants in Japan after the 2011 earthquake and tsunami and developing an open-source database to track people and resources leveraged for ongoing community monitoring of economic and social recovery. For future disasters, Airbnb will be partnering with Portland and San Francisco to pre-identify hosts for displaced people and services when an emergency occurs and to provide alerts via web and mobile technology. This will ensure that disaster response is more effective than past efforts have been and that the recovery period is as speedy as possible. SeeClickFix is using its database of citizen requests for on-the-spot services, such as debris removal, to generate actionable data on the state of community infrastructure and to facilitate recovery and, ultimately, community rebound or resilience.

Another way for private-sector companies to address predisaster social and economic conditions is to focus on improving the general resilience of those living in vulnerable communities. For example, Citigroup is focused on precrisis preparation and financial management for those who are traditionally disenfranchised; specifically, it is providing programs for the “unbanked” (those without formal bank accounts) who need immediate support in the form of prepaid benefit cards to facilitate immediate economic recovery after a disaster.

Some communities have had the business community serve as the lead predisaster recovery planning resource to build local capacity, which has ensured that communities were not left flat-footed in the ability to deploy resources while waiting for federal programs to stand up or for local staff to be trained on disaster-recovery financing programs.

Noting one company's reach into the community, one interviewee said,

We do care about the small businesses in our community because they are part of the communities as well. We work with the chambers of commerce on general tips, etc. and try to focus special merchandise toward [those businesses] so it's easier for them to come in and get [support].

How much the private sector, particularly businesses, should formalize its role or responsibility in preparedness is an open question, but the private sector is already leaning forward in the area.

Private-Sector Contributions to Response and Recovery

Once a disaster occurs, time is of the essence in responding to immediate individual and community needs as a precursor to the longer process of recovery. Although national governments, nongovernmental organizations, and intergovernmental organizations usually take the lead in relief efforts, private-sector companies have increasingly emerged as major players in disaster response and recovery in ways that go beyond individual business continuity of operations. These organizations provide goods and services immediately after disaster and play roles in logistics and support activities during both disaster response and recovery (Fritz Institute, 2005). The private sector, particularly industry, has opted to provide its contributions to disaster response and recovery primarily either through single funds, as in the case of the Boston Marathon bombing, or through philanthropic partners, such as the American Red Cross or national or local foundations. Most information to date is based on data from larger nongovernmental organizations and companies; as a result, findings should be reviewed in that light.

Other activities of smaller companies might not be as well tracked or systematically assessed.

As one example, in addition to public dollars for the hurricanes of 2005, there were significant outlays from the private sector. One year later (as of June 30, 2006), private donations totaled \$3.5 billion. The Allstate Foundation Hurricane Recovery Fund distributed \$1.2 million in grants among three leading community foundations that served nonprofits in New Orleans, southern Mississippi, and the coastal region of eastern Texas (Business Civic Leadership Center, 2007). A total of 50 nonprofit organizations in those areas received grants from Allstate Foundation funds. These organizations implemented projects that served nearly 1.5 million people in hard-hit regions, though there is very little information on the actual use and effectiveness of these dollars, how these dollars supplemented public dollars, and how they were targeted.

Hurricane Sandy provides a recent example to illustrate the private sector's role in response and recovery. The federal government provided approximately \$60 billion, private corporations donated \$141 million, and nonprofits raised more than \$500 million for distribution to affected Sandy residents and communities. Although these data provide insight into the relative distribution, it is difficult to obtain data to fully capture other investments that corporations might have made to support employees, to ensure business continuity of operations, or to support other community redevelopment. As of December 2012, about 90 organizations had raised more than \$400 million for Hurricane Sandy relief. Two-thirds of business aid came from direct monetary donations to organizations, such as the American Red Cross and Feeding America (U.S. Chamber of Commerce Foundation, 2013). The top organizations that received corporate donations were the American

Red Cross, the Salvation Army, the Robin Hood Foundation, the United Way, and the Mayor's Fund to Advance New York City. Other donations were to local 501(c)(3) organizations and local disaster-relief funds.

The most frequent donation was \$100,000, but amounts ranged from around \$4,000 to \$23 million. Comcast raised the majority of its funds through a benefit concert. Most companies donated funding to immediate relief efforts and not long-term recovery or mitigation. Donations tended to be greatest from cable companies, business and financial institutions, banking institutions, health care organizations, grocery retailers, motor companies, and sporting organizations (Major League Baseball, Major League Soccer, the National Association for Stock Car Auto Racing, the National Basketball Association, and the National Football League). The top five types of assistance for which organizations received funding were for grant-making, nonfood relief supplies, food, volunteer coordination and capacity-building, and cleanup. Seven percent of funds expended were grants to individuals, families, and businesses (U.S. Chamber of Commerce Foundation, 2013).

Public–Private Collaborations

Although the examples above show that the public and private sectors can and do act independently in disaster preparedness, response, and longer-term recovery, public–private partnerships are integral because they can help to increase efficiency and effectiveness in disaster management. Specifically, the partnerships between private actors and public-sector partners and recipients can alter the *strategic focus of disaster-management agencies*. For instance, when government views the private sector as a full partner, the govern-

ment expects the private sector to assume a level of accountability and responsibility before, during, and after emergencies. Public–private partnerships can make disaster-management operations more flexible. Private-sector consultants, specifically from business, can be quickly hired for project-oriented purposes and can be discharged once the project is complete. The private sector is essentially a scalable asset that can be used to supplement government workers on specific disaster-management projects.

Public–private partnerships can also play a significant role in *tactical response to emergencies* and thus contribute in powerful ways to strengthen resilience (Busch and Givens, 2013). Public–private partnerships can reduce the burdens placed on government to provide certain goods and services immediately and over time, permitting the public sector to focus on other important strategic priorities (Busch and Givens, 2013). For example, in the aftermath of Hurricane Katrina, Wal-Mart played a vital role in distributing relief supplies to Gulf Coast residents. But Wal-Mart and other companies did not tend only to their narrow interests. The disaster plans they had in place allowed them to fill broader needs far in advance of the official first responders. Wal-Mart frequently outpaced FEMA, sometimes by days, in getting trucks filled with emergency supplies to relief workers and citizens whose lives the storm upended (Zimmerman and Bauerlein, 2005). In short, partnerships between firms and government are reshaping disaster-management strategy, operations, and tactics.

Even when there is not a formal public–private partnership, for-profit businesses can provide important *templates for the design of public-sector programs*. The example of New Zealand's response to the Christchurch earthquake provides one way in which principles that the private sector framed influenced and guided public-sector

programs; specifically, public-sector programs successfully applied a business focus to public-sector investment by using a business-minded benefit realization management strategy. The public sector invested approximately \$200 million in six information and community technology projects, including initiatives to support jobs in Christchurch and to manage land-title records electronically. For the earthquake response, the public sector created an earthquake support subsidy to help companies operate while keeping their staff and paying wages. They also created an online earthquake employment support system to help employers and employees apply for financial help in a coordinated way; this program was designed to remove uncertainty about jobs, but it had the long-term benefit of creating social will and commitment to community rebuilding. By using private-sector insights, the government could get the website running more quickly; this also helped to allay frustrations and move people through the system more efficiently (New Zealand Office of the Auditor-General, 2012).

Much like the example in New Zealand following its earthquake, in Cedar Rapids, Iowa, the public sector based its business disaster case management program on the model used in business case management approaches, whereby a team is deployed to support the business in developing more-efficient or -effective processes. The program's goal was to strengthen small-business capacity, and it focused on providing technical assistance to smaller to midsize businesses (e.g., coffee shops, manufacturing firms) on how to rebuild and weather economic downturns. During a three-year period (2008–2011), the Iowa program reported that it reached out to 1,230 businesses. Of that amount, 565 businesses received support from business case management teams. Case managers then worked with businesses to help them through the

Jump Start 2 funding process. This process helped the businesses recover approximately \$45 million (Cedar Rapids Area Chamber of Commerce, 2012).

Public-private partnerships inevitably have coordination challenges, which we discuss more below. But business-designed models are trying to address such challenges. Single Automated Business Exchange for Reporting was created by a private-sector company, and DHS is disseminating it. Operation Dragon Fire is another platform to improve transparency and sharing among agencies in the public and private sectors, led by the Centers for Disease Control and Prevention and National Voluntary Organizations Active in Disaster, but the program has not been rigorously evaluated yet. Appallicious has launched the Disaster Assessment and Assistance Dashboard to help communities survive disaster. San Francisco and IDEO have launched the City72 Toolkit to enable communities, including the private sector, to create their own preparedness platforms.

These platforms might also address the critical issue of keeping the private sector engaged beyond the disaster by providing usable information for routine operations. These operating pictures, or situational awareness, might facilitate public-private collaborations by articulating the bounds or parameters of partnership and by helping to broker relationships. One interviewee articulated the current challenge:

Sometimes, what happens is that someone says they want a connection, and they'll call us and say "can we have a [public-private] partnership?" but they don't know what that means. Having clear definitions, having the platform, having an enhanced understanding of how the private sector works would help as well.

Opportunities for Private-Sector Involvement

There are several ways in which the private sector, particularly businesses, is key to disaster recovery. The private sector is key to developing and implementing flexible financing models. It is also critical in ongoing resilience development.

The private sector contributes to disaster-recovery financing via the speed and timing of funding. Private-sector investment is considered a more flexible pathway for communities, free of many of the administrative hurdles that come with government dollars. This can take the form of philanthropies, with donations from business, or direct, corporate philanthropic arms. Private-sector entities have been helpful in offering privately funded working-capital funds. These funds can help businesses stay afloat. But often these funds are not well coordinated among private-sector organizations or with public-sector entities to organize and build support locally around a particular industry's risk and to create a loan fund. Interview participants noted that private-sector entities could be instrumental in administering special accounts or coordinating with the public sector in this regard, without significant overhead.

The private sector contributes to disaster-recovery financing via the speed and timing of funding. Private-sector investment is considered a more flexible pathway for communities, free of many of the administrative hurdles that come with government dollars.

Although it is not a private-sector entity, the World Bank can also provide a useful example. The World Bank uses special accounts for community development and, in some cases, global disaster response. To ensure that dollars flow fast enough to where they are needed, the World Bank can release funds to organizations (and usually local government) before the grantee begins spending the money. The grantee or borrower needs to demonstrate its capability to track and administer these funds (World Bank, 1994).

But these accounts have not been used in the United States. One interviewee noted that they should be:

FEMA should have something like [World Bank special accounts] that at least puts 10 percent of the funds out front, which would be a low-risk way of speeding up the process, since initial assessments are, if anything, low. Perhaps private-sector organizations could be looped in to coordinate the funds with the local government because they could move more quickly without a lot of overhead.

The private sector is also key to improving general resilience. More specifically, our research shows that the private sector can play a role in *improving the resilience of vulnerable communities*. Earlier, for example, we discussed Citigroup's focus on precrisis preparation and financial management for those who are traditionally disenfranchised and the programs it provides for the unbanked, populations who would benefit from immediate support in the form of prepaid benefit cards.

Looking at this issue more broadly, some interviewees explained that preparedness should include basic training and general outreach in the community itself, which would help address potential inequities in social (e.g., population literacy) and

economic (e.g., financial literacy) conditions specifically. One interviewee noted,

You do demographic profiles for where disasters have hit, and you see literacy rates that are very low, so you can't start talking about recovery and development until you deal with basic social issues. Part of recovery initiative might be to provide more literacy assistance, which has nothing to do with disaster but does shine light on these themes and needs on the general community profile.

Every disaster analysis has illustrated the challenges faced when predisaster social and economic conditions appear to exacerbate the effects of disaster. In the past several years, it has become clear that natural disasters have affected individuals and groups with special socioeconomic characteristics more than they have affected others. High levels of vulnerability and low adaptive capacity have been linked to a range of factors. These include access and distribution of resources, technology, information, and wealth; risk perceptions; social capital and community structure; and the existing formalized institutional framework, which organizes warning, planning, and other services (Dolan and Walker, 2006). Vulnerability to natural disasters is a “combined function of exposure (risk of experiencing a disaster event) and the ability to cope” (Masozera, Bailey, and Kerchner, 2007, p. 300). Analyses have indicated that low-income members of communities are more likely than other community members to die, suffer from injuries, have proportionately higher material losses, have more psychological trauma, and face more obstacles during the phases of response, recovery, and reconstruction (Fothergill and Peek, 2004). Many low-income groups, which are largely minorities and women, also frequently live in hazardous areas because property values and housing costs

are lower (Paterson, 1998; Godschalk et al., 1999). For example, between 1990 and 2000, the population increase in Austin, Texas, caused more people to live in floodplains, but that does not mean that low-income populations could access or fully reside in those newly developed lands (Lee and Jung, 2014).

As shown in the figure, recovery is a long-term process that goes on months or even years after the disaster and focuses on rebuilding and sustainable economic development. Many scholars have written about the role of government in disaster response, arguing about the balance between individual responsibility and where government resources should start and end in support of disaster victims (Sugarman, 2007). There are many challenges contained in these arguments, including identifying what constitutes a disaster, actual disaster effects, and the vulnerabilities that already existed and might or might not require compensation. Some have argued that recovery funding incorrectly emphasizes housing rather than more-comprehensive economic rebuilding and jobs. Recently, there has been a demonstrable reorientation to include considerations of infrastructure strengthening and not simply disaster relief alone (Changnon and Easterling, 2000; Busch and Givens, 2013). But, in proportionate investment, there is still greater emphasis on how to address the usual elements of immediate disaster response than a focus on efforts to deeply assess and address the social vulnerabilities that predated the actual event (Masozera, Bailey, and Kerchner, 2007).

Given historical industry roles in offering economic opportunity in such communities (e.g., empowerment zones), the private sector (particularly business) might have a particular role in providing opportunity and leveling the playing field—in reimagining economic recovery in ways that ensure that low-income populations

Given historical industry roles in offering economic opportunity in such communities (e.g., empowerment zones), the private sector (particularly business) might have a particular role in providing opportunity and leveling the playing field—in reimagining economic recovery in ways that ensure that low-income populations are not left out of the recovery process.

are not left out of the recovery process. However, very little focused attention has been paid to what should be a consistent role for businesses in this regard.

Some have argued that home ownership is a preexisting economic condition that is a critical pathway for “transformative” assets. In short, ownership is an indicator of inherited wealth that lifts a family beyond its own achievement. Low-income residents often reside in mobile homes or poorly constructed or maintained homes. Homes of this low quality are easily damaged in a natural disaster (Pastor et al., 2006). When examining the changes in housing recovery trajectories after Hurricane Andrew, Zhang and Peacock, 2010, found that predominantly black and low-income neighborhoods experienced higher losses in home value than white and high-income neighborhoods did and took more time to return to the prior status.

Social-equity issues also affect the ability to navigate complex disaster-recovery compensation and financing systems, both individually and at the community level. Minorities and the poor might feel constrained from access to postdisaster assistance and mitigation programs (Godschalk et al., 1999). A study of the effect of Hurricane Andrew found that the poor and poor communities received less aid from disaster-recovery assistance programs than others because of the complex application process and transportation problems (Dash, Peacock, and Morrow, 1997). Middle- and higher-income disaster victims were more comfortable than low-income groups in negotiating disaster-recovery bureaucracy for assistance (Fothergill and Peek, 2004). For people who cannot afford the costs of repair, reconstruction, or relocation, it can take years to recover from the aftermath of a disaster. Additionally, the effects of a disaster can persist into the next generation because the current generation lacks the resources to recover (Adger, 1996).

One way to address social equity is through private-sector investment in human capital (e.g., building the workforce). Kuo and Means, 2012, posits that, “[b]y sending signals about the health of the community and its ability to recover from disaster, rebuilding efforts led by locally owned businesses can accomplish more than well-intentioned programs implemented by government or outside relief organizations” (p. 1008). In this context, business redevelopment could require those businesses to revisit entrepreneurial practices usually resigned to the start-up phase to foster a local spirit of innovation with new ideas for development or new product lines. The resultant social capital that business innovation and local commitment create can foster more local interest in community-driven solutions and, ultimately, greater community social cohesion.

What Challenges Does the Private Sector Face in Contributing to Disaster-Recovery Financing?

Although the private sector is heavily engaged in disaster preparedness, response, and recovery, our study also highlighted challenges for the private sector when it comes to financing—in particular, challenges that arise from lack of information availability, difficulty tracking the flow and timing of funds, and limitations on what financial supports can be provided, particularly by business. Further, there can be difficulty in explaining the value of business investment in recovery.

Information Gaps

Reviews of recent disasters and key-informant discussions underscore the continuing problem of not having a common operational picture. Most cities, states, and federal agencies still have different platforms that they use to share information. As a result, it is difficult to obtain a regional common operational picture or a picture at the city or state level that is useful to both the private and public sectors. There are three types of information shortcomings: not having complete information on what different sectors are spending, not being able to discern where the private sector (particularly businesses) can best contribute, and not having strong evaluation data on what contributions or investments are supporting effective recovery. The response to Hurricane Katrina highlighted that a lot of the private-sector organizations could not get the information they needed for recovery; this precipitated the need for more-systematic engagement of state emergency operation centers to share information with the private sector. However, the uptake and implementation of the centers has not been consistent or rigorously tested or evaluated. In an analysis of corporate roles in global

disaster response, the Center for Strategic and International Studies found that “there is still a tendency for many companies to say, ‘Here is what we have to offer,’ instead of asking what is actually needed” (White and Lang, 2012, p. 21).

Tracking private-sector investment is also particularly challenging, both for research and simply to have companies able to monitor where their dollars go. It is very difficult to piece together the total dollars that private-sector entities provide. Although there is some accounting of overall charitable contributions between for-profit business and large relief organizations, such as the American Red Cross, or sizable foundations, such as the Robin Hood Foundation, there are gaps in publicly available data on giving to smaller nonprofit or community-based organizations. We were able to locate aggregate corporate giving data, but there were challenges in locating any data that fully disaggregate the funding into categories or initiatives. This presents challenges not only in capturing the real dollars contributed but also in the pacing and sequencing of those funds, how they are used, and for what purpose.

Another issue is the lack of full visibility on how local affiliates of businesses are tracking resource allocations for local response

Tracking private-sector investment is also particularly challenging, both for research and simply to have companies able to monitor where their dollars go. It is very difficult to piece together the total dollars that private-sector entities provide.

and recovery. Although donations can be readily tracked at the corporate level of a major corporation, tracking at the store level can be difficult. Businesses note that they are trying to centralize this information and track more systematically, but developing robust systems to evaluate sales and donations is a work in progress. These difficulties in tracking can influence the business impact analysis—how supplies are affected and which businesses can remain competitive after a disaster.

Financing Processes

In addition to the lack of comprehensive information to monitor and track private-sector investments, the private sector faces some funding-related challenges in supporting disaster response and recovery. Some large companies have limits on the resources they can donate to communities because of procurement laws. State procurement laws can either prohibit or limit sales to public entities. The federal government places a cap on how much a company can sell to a public entity before that company is considered a government contractor. There are ways to simply donate the supplies or to create a waiver for catastrophic reasons only. Given that it is difficult to know what the federal government will fund for what time period of the disaster response, it can become challenging to determine what the private sector can or should supplement before hitting that cap or threshold. Although companies have identified some solutions to this challenge by working more closely with nonprofits and local businesses, the issue of procurement policy and how funds could be used is still significant, particularly if a company is not interested in being a government contractor.

Yet another financing challenge is the federal categorization and sequencing of dollars. For instance, FEMA has categories for

funding recovery (A–G); debris removal is category A, emergency protective measures are category B, and so forth. But some communities do not proceed in recovery through the linear sequence that FEMA has set out and are not always ready for the money at the expected time. The release of CDBG money is sometimes slow as well. Each of these examples presents an opportunity for the private sector to fill in the supports when the federal funding sequencing does not quite align with the true path of community recovery. They also suggest opportunities for businesses to support communities in financial management and planning—to chart out when money will be needed for particular phases of reconstruction. To date, there is no framework for how to map private-sector funds side by side with CDBG to determine which funds could slot where in the sequence of disbursement.

Also, there was significant confusion in our interviews about how to describe direct expenses, something we saw in our review of the use of funds in Hurricane Sandy, particularly the funds from businesses. Organizations varied in how they explained direct costs, whether and how those amounts were calculated, and how much direct costs were attributed to fixed costs. For instance, the Charities Bureau in New York City is now thoroughly reviewing the methodologies that varying reporting organizations use to calculate whether and how salaries and rent are included and what counts in the pre- and postdisaster periods. Given the lack of consistency with how funds are organized, following the flow and use of funds over time becomes very difficult.

Another categorization issue is the extent to which gifts or in-kind funds are valued. This valuation can skew how much a disaster response or relief organization is receiving, the absolute level of charitable giving during a disaster period (i.e., high valuation of gift

or in-kind donations can inflate organizational financial reports), and the level that can be claimed for tax deduction.

Although it has improved, the way in which funding from non-U.S. sources is received and categorized is also fraught with difficulties. The process for approving aid from international offers can significantly affect the speed and timing of the funding. An analysis of international aid processes in the past decade has revealed that the United States still lacks efficient procedures for working effectively with international partners, a difficulty that impedes the rapid flow of funds and donations and processing and categorization (White and Lang, 2012). Discussions with key informants from the private sector also revealed the challenges of logistic planning. For example, interviewees who had been part of the Hurricane Katrina response noted that U.S. officials might be able to coordinate with the private sector to help review the funding received from international sources, perhaps processing and aiding in categorizing and tracking those funds. This could facilitate the speed and appropriate sequencing of funds.

Despite the promise of the private sector driving resilience innovation, the categorization of funds can also affect how money is used to build resilient infrastructure. One of the ongoing challenges in categorization is the Robert T. Stafford Disaster Relief and Emergency Assistance Act method for calculating overall eligible costs, particularly those based on the predisaster design of a building or other type of facility (Pub. L. 100-707, 1988). The requirement that the facility be repaired to the predisaster condition often limits applicants' ability to use Stafford Act funding to rebuild a facility differently in anticipation of future impacts. Traditional reimbursement models do not generally account for adaptation to a more expansive range of stressors, including those

based on climate change. State and local governments can be reimbursed to rebuild a facility to updated codes or standards, as long as they were "applicable at the time at which the disaster occurred" (§ 406[e][1][A][ii]).

These limitations present challenges in recovery reimbursement, particularly when communities want to build back differently. Then again, this challenge could present an opportunity for private-sector investment in a green economy or smart rebuilding. Resilience-related provisions were included in the Sandy Recovery Improvement Act (Pub. L. 113-2, 2013, Division B), but it is still difficult to determine how much Sandy recipients are using dollars for mitigation and long-term adaptation. We know that \$11.5 billion to FEMA is set aside to support the long-term rebuilding of public facilities and \$16 billion to the U.S. Department of Housing and Urban Development will go to recovery, restoration of infrastructure, and economic revitalization in the most-affected and distressed areas. It will be important to rigorously evaluate not only use of these dollars for these purposes but how much investments offset future disaster effects. Further, there is a need to understand whether and how private-sector organizations kick in to complement these new public-sector provisions for adaptation and resilience strengthening.

Access and Engagement for Small Businesses and Smaller Communities

Our study also highlighted the challenges in access that smaller communities confront. For example, smaller communities, those with less infrastructure, and those with smaller tax bases, have faced challenges in using financial systems, which suggests that disparities might exist at the community level too. We know that

disaster management involves a complex network of interdependent agencies (Bigley and Roberts, 2001) that involves numerous, often unprecedented, interactions within and between various relief agencies. However, for communities with limited capacity, this network can be harder to navigate. Stakeholders in Colorado and Iowa communities noted that the financing required for their respective flood responses is often beyond the financial capabilities of smaller or midsize communities. One respondent noted,

The budget director for the town was very accustomed to an annual-budget way of thinking, and this kind of rapid cash flow was not a built-in capability. [The director] had perhaps experienced applying for a couple of grants before, but that was no preparation for the 36 we initially had to supply to FEMA to get matching funds from county, state, and national sources.

Although the potential of public–private collaborations for support is evidenced in this example, this might also suggest that there could be *public* collaborations between different municipalities or other public entities, with larger communities helping those that are smaller and have less grant-writing and related capacity.

Also, although small businesses are the engine of economic rebuilding, previous disasters have highlighted the difficulty that these smaller organizations have in securing funds and effectively using U.S. Small Business Administration loans and other resources. As a result, those communities with many small businesses struggle more than other communities do with planning for sustainable economic development. Larger corporations could be key in assisting communities that might struggle in recovery merely because of financial navigation challenges. Corporations could facilitate understanding of how to approach cash-flow issues in

Although the potential of public–private collaborations for support is evidenced in this example, this might also suggest that there could be public collaborations between different municipalities or other public entities, with larger communities helping those that are smaller and have less grant-writing and related capacity.

ways that do not simply reaffirm existing community vulnerabilities and disparities.

Communicating About Investment Value

Although private-sector companies have opportunities to speed up funding support and to invest over the long term, a few respondents noted that the case statement for actively involving businesses is difficult for communities to articulate. This can include demonstrating to shareholders that donations can benefit the company or have long-term benefits to the community. One interviewee noted,

Communities may be interested in getting an investor, but they must also look at what they are giving up on the back end (provide the ROI [return on investment]). Communities must examine if there has been opportunity for direct investment in some areas or look at ways to aggregate certain projects so they meet the threshold investors are looking for, but you must figure out how to make the efforts profitable for them.

Further, although the private sector is key to the redevelopment process, determining how to organize and target those contributions can be difficult. One respondent noted,

The public sector does not communicate the value of being involved in the community redevelopment process very well. They say, “X is important; we want you involved,” but cannot answer “why” effectively. Everyone’s time is valuable, and this does not pull enough weight. The first issue is that the public sector must demonstrate investment potential, goodwill investment, leadership investment, the involvement in the community The great example would be, if something happened in Memphis, the public sector could look to FedEx for logistics management. FedEx are folks who would know that area well, who have developed that expertise, and the public sector could lean on that expertise.

Areas for Future Inquiry

Given what the private sector is currently doing in terms of disaster-recovery financing and the challenges it faces, our review identified three areas requiring further inquiry. In each of these areas is a critical need for more-intensive analysis to fully delineate the most-effective roles for the private sector. The literature review and stakeholder interviews crystallized themes in financing roles and responsibilities for the private sector, but they also identified areas with relatively little clarity or detail on where private-sector involvement could be enhanced or more effective. In this section, we offer areas for future inquiry.

Area 1. Determine the Full Extent of Private-Sector Contributions in Disaster Recovery

When we began this analysis, we wanted to identify studies that actually rigorously evaluated the use and impact of private-sector contributions for social, economic, and related recovery outcomes. Unfortunately, there were few insights in this area. Although we can summarize some of the funding that private-sector organizations, particularly businesses, provide in the form of charitable contributions, determining the extent of other financial outlays is difficult. For example, we could not systematically capture information on how much private-sector organizations contribute to their own business continuity operations, employee recovery activities, or, in some cases, the continuity of operations of other businesses. Few data sources could also provide information on how much money private-sector organizations provided in supporting community recovery and redevelopment activities and whether there were more or less opportune times for those investments. The challenges in funding data and categorization also prevented us from splitting fiscal (e.g., labor time) from nonfiscal (e.g., volunteer time, existing capacity) resources.

Area 2. Extend Private- and Public-Sector Disaster-Recovery Analyses to Include Comparative Value of Private-Sector Engagement and Assessment of Coordination

Given that timing and sequencing of funding continues to be a significant challenge, whether there is an optimal time in the disaster sequence for private-sector funds is an open question. Further, because of the existing difficulties in understanding the length of time it takes for public-sector funds to be spent and in what

ways, it is similarly—if not more—difficult to conduct comparable analysis for private-sector, particularly business, investment dollars. Finally, most of our private-sector investment data were from natural disasters, with relatively little comprehensive insight (beyond large ballpark numbers) from other types of human-caused and technological disasters.

In addition to the challenge of fully capturing the full scope and scale of private-sector funds, there is very little understanding of the ROI of those funds. No study has rigorously assessed whether private-sector funds are being used wisely or in the most-efficient and effective ways. Tracking or linking funding with absolute recovery outcomes—such as economic rebuilding, time to new normalcy, or social recovery—has not been pursued. Rather, studies on business roles tend to focus on process indicators that facilitate engagement instead of outcomes. In the case of business contributions to economic recovery, many communities can assess the time it takes for businesses to reopen or to get back to usual operations (business continuity of operations), but more-extensive analyses of how those organizations contributed to the community tax base or supported long-term financial stability and growth are lacking. One of the interviewees noted this challenge:

There isn't a good measurement. For many, it seems as though they want to look at their tax base and how effective it is. But you can't direct attribution of what you're doing to results [in a] tax base. If you're funding a recovery project, the outcomes must be clear, and the evaluation of that should be "Did you achieve these outcomes?" It's difficult to link what you said you did to what results you saw. Instead, we should say, "Did this \$10 million investment do X, Y, and Z?"

Despite the integral roles and responsibilities of private-sector organizations in emergency management, there are very little data on the comparative value of these organizations in supporting community response and recovery from disasters.

Despite the integral roles and responsibilities of private-sector organizations in emergency management, there are very little data on the comparative value of these organizations in supporting community response and recovery from disasters. There are little evaluation data on how these groups leverage the capacities and capabilities from other routine activities (e.g., education, economic development) toward emergency preparedness. There is a need to understand the variables that affect the efficiency and effectiveness of private-sector assistance, including what organizational characteristics affect the capability of private-sector organizations in different disaster contexts. Finally, there are few data on the relative quality of private-sector engagement and what oversight procedures might be warranted. Understanding what oversight is in place that protects good outcomes while maintaining operational efficiency is merited. Building these characteristics into a funding accountability or monitoring system could help ensure that money is invested in the private-sector organizations with the greatest likelihood of success.

There also has been no comparative analysis of when private-sector engagement has accelerated disaster recovery and what combinations of public–private partnerships are most effective.

There also has been no comparative analysis of when private-sector engagement has *accelerated* disaster recovery and what combinations of public–private partnerships are most effective. For example, a matched case-study analysis (on, e.g., disaster risk exposure, infrastructure) could compare those communities that accessed more or less private-sector involvement and determine how private-sector organizations leveraged resources from routine community capacity-building activities and used them toward disaster resilience activities. A benefit–cost assessment could be conducted that more fully monetizes the private-sector contributions, the relative benefit of private-sector and public-sector dollars, and the best ways to package a combination of public- and private-sector funding for optimal community recovery.

In addition to comparative value, future study needs to more fully examine the coordination of assets between the private and public sectors and how clear private-sector organizations were about when and how they should contribute their capacities and capabilities, where the public sector wanted that assistance, and how best to move those supports and at what time in the disaster. There is also limited information on what level of oversight maintains benefits to the populations of interest within the working culture of private-

sector organizations. There have been critically successful models of how businesses were engaged in offering materials, supplies, and other resources, but there were often challenges in what could be counted (e.g., the issue of caps, procurement). Research that examines different models of asset provision and how those assets should be coordinated from the private sector could inform public- and private-sector coordination guidance. Additionally, businesses can provide many insights into fiscal management and systems to support the processing of funds for the public sector, but how much business involvement is formalized at the start of disasters is unclear. Also, it is unclear whether businesses want to be included in this way. Relatedly, although communication and situational awareness appear to have improved for business engagement, businesses were still challenged by having the visibility they needed to support their local affiliates.

In addition to comparative value, future study needs to more fully examine the coordination of assets between the private and public sectors and how clear private-sector organizations were about when and how they should contribute their capacities and capabilities, where the public sector wanted that assistance, and how best to move those supports and at what time in the disaster.

Area 3. Assess Initiatives in Which Private-Sector Organizations, Particularly Businesses, Assist in Supporting Resilience

The analysis clearly indicated that businesses were assuming greater roles in disaster recovery beyond individual business continuity of operations. As noted in examples from Wal-Mart, Citigroup, and IBM, these organizations were contributing to community disaster-preparedness activities and supporting smarter and more-resilient rebuilding. However, aside from brief case-study examples, there is rather limited information on how these business investments are implemented, the drivers of successful engagement, and how much business engagement actually contributes to future resilience. Many businesses are contributing to programs that attempt to address the needs of traditionally vulnerable populations (e.g., job training program) and to support smaller, local businesses. Yet there has been no initiative or program evaluation, which could elucidate the most-effective strategies for private-sector involvement in this area.

In addition, we noted interesting findings about how private-sector organizations are contributing to community disaster-recovery financial operations, financial literacy, and the ability to manage cash flow. But there is very little insight on whether these supports are helping and in what ways and how these supports complement or relate to more public sector–driven models. The innovative Cedar Rapids business case management model is unique in exploring ways to lift and support smaller businesses, but, aside from process analyses, this model has not been rigorously evaluated, nor have there been analyses of comparable programs in other contexts.

Additionally, it is unclear how and when businesses want to be included in this part of community support and how they want to work with public-sector entities to address longstanding, entrenched population vulnerabilities that exacerbate the length and quality of disaster recovery.

Additionally, it is unclear how and when businesses want to be included in this part of community support and how they want to work with public-sector entities to address longstanding, entrenched population vulnerabilities that exacerbate the length and quality of disaster recovery. Business leaders revealed that they felt some obligation to contribute but were unclear about what role made sense given other corporate responsibilities. The issue of what constitutes disaster effects versus preexisting issues is not solely a challenge for private-sector involvement, but it might be useful to examine where businesses have already engaged in addressing existing economic and social disparities in communities and how those opportunities can be leveraged for disaster resilience.

Finally, recent U.S. Economic Development Administration analyses (Feldman et al., 2014) expand concepts of economic development to include the larger regional ecosystem and resilience. In this context, the private sector might have new opportunities to reframe its role in this type of development to include disaster resilience along with addressing macroeconomic shocks at both local and national levels. Further, this new orientation to what con-

stitutes economic development focuses on economic actor capacities and capabilities. As such, it could marry well with other opportunities for the private sector to build those skills locally in the pre- and postdisaster periods.

Conclusion

These areas for inquiry offer proposed pathways for more-comprehensive and targeted analyses on how private-sector organizations can be used more effectively for future disaster-recovery operations. Pursuing these areas will be challenged by difficulties in capturing accurate private-sector funding data and being able to link specific investments with recovery outcomes. Teasing apart the role of private-sector contribution relative to public-sector funding will be important for understanding relative value (e.g., is the ROI on a private-sector dollar different from that for a public-sector dollar?). However, this will require being able to fully account for and categorize the funding provided, including resources offered in the form of financial assistance, staffing, and support of economic initiatives that might mitigate existing community vulnerabilities. From our review, it is clear that financial analyses have not fully captured the continuum of private-sector contributions throughout the disaster life cycle.

Teasing apart the role of private-sector contribution relative to public-sector funding will be important for understanding relative value (e.g., is the ROI on a private-sector dollar different from that for a public-sector dollar?). However, this will require being able to fully account for and categorize the funding provided, including resources offered in the form of financial assistance, staffing, and support of economic initiatives that might mitigate existing community vulnerabilities.

Bibliography

- Adger, W. Neil, *Approaches to Vulnerability to Climate Change*, University of East Anglia and University College London, Centre for Social and Economic Research on the Global Environment Working Paper GEC 96-05, 1996. As of April 4, 2016: http://cserge.ac.uk/sites/default/files/gec_1996_05.pdf
- Bernstein, Sharon, “Post-Disaster Generosity Again Attracts Cons,” *Los Angeles Times*, January 19, 2005. As of April 11, 2014: <http://articles.latimes.com/2005/jan/19/world/fg-fraud19>
- Bharosa, Nitesh, JinKyu Lee, and Marijn Janssen, “Challenges and Obstacles in Sharing and Coordinating Information During Multi-Agency Disaster Response: Propositions from Field Exercises,” *Information Systems Frontiers*, Vol. 12, No. 1, March 2010, pp. 49–65.
- Bigley, Gregory A., and Karlene H. Roberts, “The Incident Command System: High-Reliability Organizing for Complex and Volatile Task Environments,” *Academy of Management Journal*, Vol. 44, No. 6, December 2001, pp. 1281–1300.
- Board on Natural Disasters, “Mitigation Emerges as Major Strategy for Reducing Losses Caused by Natural Disasters,” *Science*, Vol. 284, No. 5422, June 18, 1999, pp. 1943–1947.
- Boyne, George A., “Public and Private Management: What’s the Difference?” *Journal of Management Studies*, Vol. 39, No. 1, January 2002, pp. 97–122.
- Busch, Nathan A., and Austen D. Givens, “Achieving Resilience in Disaster Management: The Role of Public–Private Partnerships,” *Journal of Strategic Security*, Vol. 6, No. 2, Summer 2013, Art. 1.
- Business Civic Leadership Center, *Business Disaster Assistance and Recovery*, second report: *Long-Term Recovery Issues and Case Studies*, U.S. Chamber of Commerce, August 2007. As of April 4, 2016: <https://www.uschamberfoundation.org/report/aug-2007-report-disaster-recovery>
- Cedar Rapids Area Chamber of Commerce, *First Business Case Management Program for a Natural Disaster: Cedar Rapids, Iowa—2008 Flood*, January 2012. As of April 4, 2016: http://www.cedarrapids.org/Handler.ashx?Item_ID=1A9EC6F9-E32A-4CAD-815F-42BDA1C6858C
- Center for Progressive Reform, *An Unnatural Disaster: The Aftermath of Hurricane Katrina*, Center for Progressive Publication 512, September 2005. As of April 4, 2016: http://www.progressivereform.org/articles/unnatural_Disaster_512.pdf
- Changnon, S. A., and D. R. Easterling, “Disaster Management: U.S. Policies Pertaining to Weather and Climate Extremes,” *Science*, Vol. 289, No. 5487, September 22, 2000, pp. 2053–2055.
- Chappell, William F., Richard G. Forgette, David A. Swanson, and Mark V. Van Boening, “Determinants of Government Aid to Katrina Survivors: Evidence from Survey Data,” *Southern Economic Journal*, Vol. 74, No. 2, October 2007, pp. 344–362.
- Chen, A. C.-C., V. M. Keith, K. J. Leong, C. Airriess, W. Li, K.-Y. Chung, and C.-C. Lee, “Hurricane Katrina: Prior Trauma, Poverty and Health Among Vietnamese-American Survivors,” *International Nursing Review*, Vol. 54, No. 4, December 2007, pp. 324–331.
- Chen, Rui, Raj Sharman, H. Raghav Rao, and Shambhu J. Upadhaya, “An Exploration of Coordination in Emergency Response Management,” *Communications of the ACM*, Vol. 51, No. 5, 2008, pp. 66–73.
- Dash, Nicole, Walter Gillis Peacock, and Betty Hearn Morrow, “And the Poor Get Poorer: A Neglected Black Community,” in Walter Gillis Peacock, Betty Hearn Morrow, and Hugh Gladwin, eds., *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*, Miami, Fla.: Florida International University, International Hurricane Center, Laboratory for Social and Behavioral Research, 1997, pp. 206–224.
- DHS—See U.S. Department of Homeland Security.
- Dolan, A. H., and I. J. Walker, “Understanding Vulnerability of Coastal Communities to Climate Change Related Risks,” *Journal of Coastal Research*, Special Issue 39, Winter 2006, pp. 1316–1323.
- Eaton, Leslie, and Ron Nixon, “Loans to Homeowners Along Gulf Coast Lag,” *New York Times*, December 15, 2005. As of April 4, 2016: <http://www.nytimes.com/2005/12/15/us/nationalspecial/loans-to-homeownersalong-gulf-coast-lag.html>
- Federal Bureau of Investigation, “Insurance Fraud,” undated. As of April 4, 2016: http://www.fbi.gov/stats-services/publications/insurance-fraud/insurance_fraud
- Federal Emergency Management Agency, “Disaster Declarations,” undated. As of November 1, 2015: <https://www.fema.gov/disasters>
- , *A Whole Community Approach to Emergency Management: Principles, Themes, and Pathways for Action*, Washington, D.C., FDOC 104-008-1, December 1, 2011. As of April 4, 2016: <https://www.fema.gov/media-library/assets/documents/23781>

Feldman, Maryann, Theodora Hadjimichael, Tom Kemeny, and Lauren Lanahan, *Economic Development: A Definition and Model for Investment*, Washington, D.C.: U.S. Economic Development Administration, May 28, 2014. As of April 4, 2016: <https://www.eda.gov/tools/files/research-reports/investment-definition-model.pdf>

FEMA—See Federal Emergency Management Agency.

Fothergill, Alice, and Lori A. Peek, “Poverty and Disasters in the United States: A Review of Recent Sociological Findings,” *Natural Hazards*, Vol. 32, No. 1, May 2004, pp. 89–110.

Fritz Institute, *Logistics and the Effective Delivery of Humanitarian Relief*, San Francisco, Calif., 2005. As of April 26, 2016: <http://www.fritzinstitute.org/PDFs/Programs/tsunamiLogistics0605.pdf>

Gladwin, Hugh, and Walter Gillis Peacock, “Warning and Evacuation: A Night for Hard Houses,” in Walter Gillis Peacock, Betty Hearn Morrow, and Hugh Gladwin, eds., *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*, New York: Routledge, 1997, pp. 52–74.

Godschalk, David R., Timothy Beatley, Philip Berke, David J. Brower, and Edward J. Kaiser, *Natural Hazard Mitigation: Recasting Disaster Policy and Planning*, Washington, D.C.: Island Press, 1999.

Hooks, Jonathan P., and Trisha B. Miller, “The Continuing Storm: How Disaster Recovery Excludes Those Most in Need,” *California Western Law Review*, Vol. 43, No. 1, 2006, Art. 4. As of April 4, 2016: <http://scholarlycommons.law.cwsl.edu/cwlr/vol43/iss1/4/>

Kuo, Susan S., and Benjamin Means, “Corporate Social Responsibility After Disaster,” *Washington University Law Review*, Vol. 89, No. 5, 2012, pp. 11–24. As of April 4, 2016: http://openscholarship.wustl.edu/law_lawreview/vol89/iss5/3/

Lee, Dalbyul, *The Impact of Natural Disasters on Neighborhood Change: Longitudinal Data Analysis*, Atlanta, Ga.: Georgia Institute of Technology, doctoral thesis, December 2012. As of April 4, 2016: <http://hdl.handle.net/1853/50113>

Lee, Dalbyul, and Juchul Jung, “The Growth of Low-Income Population in Floodplains: A Case Study of Austin, TX,” *KSCE Journal of Civil Engineering*, Vol. 18, No. 2, March 2014, pp. 683–693.

Leonard, Devin, “The Only Lifeline Was the Wal-Mart,” *Fortune*, Vol. 152, October 3, 2005, pp. 74–80. As of April 4, 2016: http://archive.fortune.com/magazines/fortune/fortune_archive/2005/10/03/8356743/index.htm

Logan, John R., *The Impact of Katrina: Race and Class in Storm-Damaged Neighborhoods*, Providence, R.I.: Brown University, undated. As of April 4, 2016: <http://www.s4.brown.edu/katrina/report.pdf>

Masozera, Michel, Melissa Bailey, and Charles Kerchner, “Distribution of Impacts of Natural Disasters Across Income Groups: A Case Study of New Orleans,” *Ecological Economics*, Vol. 62, No. 2–3, August 1, 2007, pp. 299–306.

McEntire, David A., “Coordinating Multi-Organisational Responses to Disaster: Lessons from the March 28, 2000, Fort Worth Tornado,” *Disaster Prevention and Management*, Vol. 11, No. 5, 2002, pp. 369–379.

Muller, Alan, Gail Whiteman, and Judith M. Van der Voort, *The Tsunami Effect: Multinational Companies and Natural Disasters*, paper presented at the Annual Meeting of the Academy of Management, Atlanta, Ga., 2006.

Muro, Mark, Amy Liu, Rebecca Sohmer, David Warren, and David Park, *New Orleans After the Storm: Lessons from the Past, a Plan for the Future*, Washington, D.C.: Brookings Institution, October 2005. As of April 4, 2016: <http://www.brookings.edu/research/reports/2005/10/new-orleans-after-the-storm>

Murray, John S., “Responding to the Psychosocial Needs of Children and Families in Disasters,” *Critical Care Nursing Clinics of North America*, Vol. 22, No. 4, December 2010, pp. 481–491.

New Zealand Office of the Auditor-General, *Realising Benefits from Six Public Sector Technology Projects*, June 2012. As of April 4, 2016: <http://www.oag.govt.nz/2012/realising-benefits/docs/realising-benefits.pdf>

Oxfam America, *Recovering States? The Gulf Coast Six Months After the Storms*, Oxfam Briefing Paper 4, February 2006.

Pastor, Manuel, Robert D. Bullard, James K. Boyce, Alice Fothergill, Rachel Morello-Frosch, and Beverly Wright, *In the Wake of the Storm: Environment, Disaster, and Race After Katrina*, New York: Russell Sage Foundation, 2006.

Paterson, Robert G., “The Third Sector: Evolving Partnerships in Hazard Mitigation,” in Raymond J. Burby, ed., *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*, Washington, D.C.: Joseph Henry Press, 1998, pp. 203–262.

Peacock, Walter Gillis, Betty Hearn Morrow, and Hugh Gladwin, eds., *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*, Miami, Fla.: International Hurricane Center, Laboratory for Social and Behavioral Research, Florida International University, 2000.

- Peacock, Walter Gillis, and A. Kathleen Ragsdale, "Social Systems, Ecological Networks and Disasters: Toward a Socio-Political Ecology of Disasters," in Walter Gillis Peacock, Betty Hearn Morrow, and Hugh Gladwin, eds., *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*, New York: Routledge, 1997, pp. 20–35.
- Phillips, Brenda D., "Sheltering and Housing of Low-Income and Minority Groups in Santa Cruz County After the Loma Prieta Earthquake," in Joanne M. Nigg, ed., *The Loma Prieta, California, Earthquake of October 17, 1989: Recovery, Mitigation, and Reconstruction*, Washington, D.C.: U.S. Geological Survey Professional Paper 1553-D, 1998, pp. 17–28. As of April 4, 2016: <http://pubs.usgs.gov/pp/pp1553/pp1553d/>
- Prizzia, Ross, "The Role of Coordination in Disaster Management," in Jack Pinkowski, ed., *Disaster Management Handbook*, Boca Raton, Fla.: CRC Press, 2008, pp. 75–100.
- Public Law 100-707, Robert T. Stafford Disaster Relief and Emergency Assistance Act, November 23, 1988.
- Public Law 113-2, Disaster Relief Appropriations, January 29, 2013. As of April 5, 2016: <https://www.gpo.gov/fdsys/pkg/PLAW-113publ2/html/PLAW-113publ2.htm>
- Purtle, Jonathan P., Nadia J. Siddiqui, and Dennis P. Andrulis, "Language Issues and Barriers," in K. Bradley Penuel and Matthew Statler, eds., *Encyclopedia of Disaster Relief*, Vol. 1: A–O, Sage Publication, 2011, pp. 379–382.
- Ren, Yuqing, Sara Kiesler, and Susan R. Fussell, "Multiple Group Coordination in Complex and Dynamic Task Environments: Interruptions, Coping Mechanisms, and Technology Recommendations," *Journal of Management Information Systems*, Vol. 25, No. 1, Summer 2008, pp. 105–130.
- Sugarman, Stephen D., "Role of Government in Compensating Disaster Victims," *Issues in Legal Scholarship*, Vol. 2007, 2007, Art. 1.
- Taylor, John, and Josh Silver, "From Poverty to Prosperity: The Critical Role of Financial Institutions," in Chester W. Hartman and Gregory D. Squires, eds., *There Is No Such Thing as a Natural Disaster: Race, Class, and Hurricane Katrina*, New York: Routledge, 2006, pp. 233–254.
- Tekeli-Yeşil, Sıdıka, Necati Dedeoğlu, Marcel Tanner, Charlotte Braun-Fahrlander, and Birgit Obrist, "Individual Preparedness and Mitigation Actions for a Predicted Earthquake in Istanbul," *Disasters*, Vol. 34, No. 4, 2010, pp. 910–930.
- Toya, Hideki, and Mark Skidmore, "Economic Development and the Impacts of Natural Disasters," *Economics Letters*, Vol. 94, No. 1, January 2007, pp. 20–25.
- United Nations Office for Disaster Risk Reduction, "Top IBM and AECOM Executives Join UNISDR Private Sector Advisory Group as Commitment by Sector to Disaster Risk Reduction Grows," press release, June 9, 2011. As of April 18, 2016: <https://www.unisdr.org/archive/20275>
- U.S. Chamber of Commerce Foundation, data from Corporate Aid Tracker after Hurricane Sandy, extracted 2013.
- U.S. Department of Homeland Security, *Fiscal Year 2009 Regional Catastrophic Preparedness Grant Program: Guidance and Application Kit*, November 2008. As of June 2013: http://www.fema.gov/media-library-data/20130726-1823-25045-7979/fy_2009_rcpgp_guidance_final.pdf
- White, Stacey, and Hardin Lang, *Corporate Engagement in Natural Disaster Response: Piecing Together the Value Chain*, Washington, D.C.: Center for Strategic and International Studies, Project on U.S. Leadership in Development, January 17, 2012. As of April 4, 2016: <http://csis.org/publication/corporate-engagement-natural-disaster-response>
- World Bank, "Special Accounts," Operational Manual 12.20, May 1994. As of April 4, 2016: <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20064697-menuPK:51508119-pagePK:64141683-piPK:4688102-theSitePK:502184,00.html>
- Zahran, Sammy, Lori Peek, and Samuel D. Brody, "Youth Mortality by Forces of Nature," *Children, Youth and Environments*, Vol. 18, No. 1, 2008, pp. 371–388.
- Zhang, Yang, and Walter Gillis Peacock, "Planning for Housing Recovery? Lessons Learned from Hurricane Andrew," *Journal of the American Planning Association*, Vol. 76, No. 1, 2010, pp. 5–24.
- Zimmerman, Ann, and Valerie Bauerlein, "At Wal-Mart, Emergency Plan Has Big Payoff," *Wall Street Journal*, September 12, 2005. As of April 4, 2016: <http://www.wsj.com/articles/SB112648681539237605>

About This Perspective

The changing scope and scale of disasters, both natural and technological, have altered the ways in which disaster management and financing are addressed and the roles of private-sector organizations specifically. Businesses and nonprofit organizations are increasingly central to the process, offering critical support in immediate disaster response but also contributing necessary redevelopment funding that supports community recovery. Although these new expectations position the private sector as a key leader in community resilience, these responsibilities have not been fully met with established guidance or clear metrics for how and when these organizations should participate in disaster recovery and financing.

This perspective examines key issues confronting the private sector in disaster-recovery financing, what roles private-sector entities have played, and where there has been successful integration or leadership of these organizations. The perspective also briefly explores challenges that the private sector faces, with particular attention to issues of information use and application, coordination in response and recovery, and timing of funding. Given continued data gaps in this field, we offer opportunities for research and policy analysis.

Funding for this study was provided by generous philanthropic contributions to the RAND Center for Catastrophic Risk Management and Compensation.

RAND Center for Catastrophic Risk Management and Compensation

The RAND Center for Catastrophic Risk Management and Compensation seeks to identify and promote laws, programs, and institutions that reduce the adverse social and economic effects of natural and human-caused catastrophes by improving incentives to reduce future losses; providing just compensation to those suffering losses while appropriately allocating liability to responsible parties; helping affected individuals, businesses, and communities to recover quickly; and avoiding unnecessary legal, administrative, and other transaction costs.

Questions or comments about this report should be sent to the project leader, Anita Chandra (Anita_Chandra@rand.org). For more information about the RAND Center for Catastrophic Risk Management and Compensation, see www.rand.org/jie/justice-policy/centers/catastrophic-risk-management or contact the director at ccrmc@rand.org.

Limited Print and Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law. This representation of RAND intellectual property is provided for noncommercial use only. Unauthorized posting of this publication online is prohibited. Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please visit www.rand.org/pubs/permissions.html.

The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest.

RAND's publications do not necessarily reflect the opinions of its research clients and sponsors. **RAND®** is a registered trademark.

For more information on this publication, visit www.rand.org/t/PE187.



www.rand.org