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Population Displacement and Housing Dilemmas Due to Catastrophic Disasters

Joyce N. Levine
Ann-Margaret Esnard
Alka Sapat

As Hurricane Katrina revealed, coastal communities have become far more vulnerable to tropical storms and the long-term displacement of residents. Yet, because the emergency management model presumes that recovery quickly follows response, governments focus only on short-term, localized displacement. However, long-term and long-distance displacement exposes a gray area between immediate shelter and permanent housing, along with concerns about vulnerability, housing availability, and land development. We begin this article by discussing the transition between response and recovery. We then review literature regarding social vulnerability, displacement, provision of temporary housing, households' return decisions, and disaster-driven land development and housing construction processes. We close with thoughts on future research to increase planners' understanding of the issues involved and to help them craft effective policies.

Keywords: *Disasters; population displacement; affordable housing; social vulnerability; emergency management*

The worst-case scenario for New Orleans that Hurricane Katrina set in motion had been widely known for years before it occurred (Bourne 2004; Fischetti 2001). The destruction caused by the hurricane displaced more than one million people, many of whom were low-income minorities.¹ The area covered by the National Disaster Declaration was 90,000 square miles,

an expanse only slightly smaller than the state of Wyoming. Total damage from this storm tops \$200 billion, making it by far the most expensive disaster in American history. A lengthy timeframe, extraordinary capital investment, and bipartisan political support will be necessary to rebuild New Orleans, prolonging the duration of the displacement and increasing the number of displaced residents who do not return to the city, or even to the state of Louisiana. This massive displacement and emerging trends of seemingly temporary but perhaps permanent host communities² demands a bold response from researchers and governments alike. The centerpiece of this response should be more effective policies regarding both short- and

JOYCE N. LEVINE, PhD, American Institute of Certified Planners (AICP), is an assistant professor of Urban and Regional Planning at Florida Atlantic University. Her research interests include emergency management, hazard mitigation, sustainable development, and global climate change, with a particular focus on the role of planners in improving community resilience.

ANN-MARGARET ESNARD, PhD, is the director of the Visual Planning Technology Lab and an associate professor of Urban and Regional Planning at Florida Atlantic University. Her expertise encompasses coastal vulnerability assessment, land use planning, disaster planning and GIS/spatial analysis.

ALKA SAPAT, PhD, is the PhD Coordinator and an associate professor of Public Administration at Florida Atlantic University. Her expertise and areas of interest are disaster policy and planning, environmental issues, and policy analysis.

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long-term housing that also consider other critical household needs—income support, transportation, health care, and so forth.

However, unique as New Orleans is, it cannot be viewed as an isolated or singular case. Other coastal communities in hurricane-prone states—a band that stretches from Texas on the west along the Gulf Coast to Florida and then up the Atlantic Coast to North Carolina—are becoming increasingly vulnerable to catastrophic storms. Morrow (2005) notes that twelve years after Hurricane Andrew struck Miami-Dade County in South Florida, many vulnerabilities still remained, particularly with respect to rental housing. Certain groups, notably the poor, minorities, the elderly, large households, and female-headed households, were disproportionately affected. Tony Palermo, a senior planner for Lee County, Florida, points out that when the 2005 hurricane season started, “10,000 people in [adjacent] Charlotte County were still living in temporary housing after being displaced by Hurricane Charley in 2004. . . . more than 2,300 apartments [nearly 25% of the county’s rental stock] were damaged by the hurricane” (Schwab 2005, 16).

Additionally, evidence is emerging that global warming may, in fact, contribute to the frequency and intensity of storms as well as to rising sea levels (Emanuel 2006; International Panel on Climate Change 2007; Mann and Emanuel 2006). As a result, not only might individual states or regions be affected by more intense hurricanes and more coastal flooding, but it becomes more likely that two or even three areas might suffer catastrophic damage within a few months each year.³ However, our capacity to respond to the human dimensions of these events is limited by our failure to recognize important nuances that appear in each phase of the response/recovery model. Hurricane Katrina has made it clear that we need to pay attention to such nuances.

In particular, what the Katrina experience has demonstrated is that a poorly specified phase occupies the period between response and full recovery. On its face, the widely used four-step emergency management model presumes that movement from response to recovery occurs within a relatively short time span predicated on physical repair and reconstruction. What a superficial reading of the model overlooks—or, rather, what is seldom acknowledged to exist—is that the human aspects of response and recovery do not always flow quickly or smoothly. And as Katrina’s destruction has revealed, human recovery from a catastrophic blow may also have to take place far from the disaster site. As a result, we need to address all aspects of the well-being of the people displaced by the event: food and clothing, temporary shelter, jobs and income, K-12 education, health care, and of course, housing.

Providing housing for the displaced raises a variety of corollary issues such as household income, housing availability and affordability, and the use of land. The convergence of these issues means that the housing needs of the displaced population will create impacts that are sometimes far removed from the disaster area. For example, within two weeks of Katrina’s destruction, upward pressure on home and rental prices in Baton Rouge made headlines (Opdyke 2005). Refugees from New Orleans have been resettled in Arizona, Rhode Island, and other places that are not only distant from the city but also unlike it in terms of social structure, cultural attributes, and economic sectors (Grier 2005). Providing long-term housing under emergency conditions is likely to prompt development of greenfield sites, promoting sprawl and inhibiting the ability of infrastructure and social service providers to readily meet the needs of the incoming population. Perhaps the quintessential example of this practice can be found in Baker, Louisiana, where several hundred households from New Orleans live in trailers lined up in a former cow pasture, complete with sewer service but devoid of transport, jobs, and a food store (Axtman 2005).

Until now, state and county policies have focused primarily—and rightly—on short-term and localized displacement. However, we may now be entering an era in which long-term and long-distance displacement become more common. Even states in the hurricane belt are poorly equipped to address the relocation, land development, infrastructure, and market problems associated with widespread long-term displacement. State planning requirements are very uneven, ranging from Florida’s recent requirement that comprehensive plans include an emergency planning component to Mississippi’s continued reliance on the model planning and zoning ordinances prepared in the 1920s. Some states review county and municipal plans, either statewide (Florida) or within the coastal zone (North Carolina), while others take a hands-off approach. Emergency management systems are state-dependent for allocation of resources and assistance during and after catastrophic events, placing potentially enormous burdens on state finances when the states are struggling just to fund normal operations.

This article begins by describing what is known about the transition between the response and recovery phases within the emergency management model. It then proceeds with a review of literature regarding social vulnerability, large-scale displacement, dilemmas associated with providing temporary housing, considerations that go into households’ decisions as to whether to return to the disaster area or not, and the dynamics of the land development and housing construction processes that lead to sprawl. We conclude by identifying policy gaps and future research directions.

THE STANDARD EM MODEL

The Disaster Life Cycle model developed by the Federal Emergency Management Agency (FEMA) is comprised of four phases: Pre-disaster mitigation planning; preparedness; emergency response; and recovery and reconstruction (Haddow and Bullock 2003). During the last decade, concerted efforts have been made at all levels of government to incorporate mitigation principles as integral to the pre- and post-disaster phases. The desired outcome is for communities to emerge from post-disaster recovery and long-term reconstruction safer and less vulnerable to future disasters. Use of the post-disaster period as a window of opportunity to incorporate sustainable development principles and apply comprehensive management approaches has also been widely promoted (Eadie et al. 2001; Esnard 2003; Mileti 1999; Schwab et al. 1998; Wu and Lindell 2004).

Ensuring a smooth transition from response to full recovery/reconstruction largely depends on the coordinated efforts of local, state, and federal agencies and between government and the private sector. There are various examples of situations in which a lack of coordination has compounded the impacts of a natural disaster via creation of a man-made institutional disaster (Peacock et al. 2000; Kapucu 2005). Efforts made toward mitigation of hazards are sometimes socially and politically unacceptable, as in New Orleans, where new flood maps require the elevation of homes if they are to qualify for federal flood insurance. Already, people have begun to reconstruct their homes without raising them, putting them at future risk. Installation of protective infrastructure such as levees and retaining walls can be hotly contested between local and state governments on the one hand and the federal government on the other, sometimes with the result that important measures lose funding opportunities or are delayed unnecessarily.

The damage and stress generated by large-scale widespread events can further exacerbate the period between response and full recovery by creating complex decision-making demands that are not well understood:

- Multiple governance structures operate simultaneously and in parallel within a fragmented policy environment resistant to centralized control. For example, by law a disaster declaration at the state or federal level activates temporary structures of governance that are overlaid on top of normal emergency operations at all levels.
- Hurricane-prone states occupy different stages in setting up statutes and laws that promote the tenets of mitigation and sustainability in a meaningful way (Institute for Business and Home Safety 2004). Some states like Florida now include a requirement for post-storm recovery planning within the statutory planning requirements for coastal jurisdictions. Florida also encourages citizen participation and incorporation of a

shared vision for recovery and prioritization of projects (Florida Department of Community Affairs 2005).

- There seem to be gaps among the roles and responsibilities of the three groups of professionals involved in recovery and reconstruction: local emergency managers—those who maintain and implement plans for first response to events; redevelopment agencies, land use planners, engineers, public works officials, and building officials, who focus their energies on the task of rebuilding; and NGOs and community-based organizations, which, because of their diversity, fall into both camps (Levine et al. 2006).

It is within this poorly understood transition period that issues of displacement, temporary housing, provision of long-term housing, and land development issues rise to prominence. Among the embedded concerns are social vulnerability, displacement of large populations, resettlement and housing provision, return decisions, and short-term thinking about land development that often leads to ineffective outcomes and sprawl.

SOCIAL VULNERABILITY

The relationship between the physical and social aspects of vulnerability has been acknowledged by numerous scholars. Physical vulnerability results from location with respect to potential hazards, poor or inadequate construction of buildings, age of structures, and so forth. Social vulnerability involves the relative ability of an individual, household, or community capacity to respond appropriately to threatening conditions. Lack of income, lack of transport, age, gender, minority status, lack of information, and numerous other factors may contribute to social vulnerability. A number of authors (Bogard 1989; Cutter 1993; Cutter and Emrich 2006; Dow 1992; Downing 1991; Smith 1992) have noted that vulnerability is a function not only of immediate physical conditions, but also of society's capacity to withstand disasters. Bohle et al. (1994) and Dow and Downing (1995) define vulnerability as a multi-dimensional construct captured in physical and socioeconomic factors. Other research has integrated social response with physical risks in a wide array of spatial contexts (Degg 1993; Lewis 1987; Liverman 1986, 1990; Longhurst 1995; Mitchell et al. 1989; Palm and Hodgson 1992; Wilhite and Easterling 1987).

Kamel and Loukaitou-Sideris (2004) found that following the Northridge earthquake, marginalized groups continued to encounter problems in accessing residential aid and assistance. Ideally, pre- and post-disaster social vulnerability assessments for single-hazard events and joint natural and technological hazards should incorporate a wide range of factors: age; disabilities; family structure and social networks; immobility; housing and

the built environment; home ownership; population densities; income and material resources; the availability and affordability of property insurance; critical lifelines; occupation; and race and ethnicity (Burby et al. 2003; Chang 2001; Clark et al. 1998; Cutter et al. 2003; Fothergill and Peek 2004; Kunreuther 1998; Lewis 1987; Palm 1998).

Although community- and state-centric social vulnerability assessments abound in the literature, social vulnerability studies comparing hurricane-prone coastal states are generally lacking. The development of the Social Vulnerability Index (SoVI), an additive model based on eleven independent indices, begins to fill this gap (Cutter et al. 2003). This index includes information about demographics (population growth, socioeconomic status, gender, race/ethnicity, age, family structure, occupation, social dependence, and special-needs population); land use (value, quality and density of commercial and industrial development and of residential property, density of medical facilities, and extent of infrastructure), and housing tenure (rental versus ownership). Using the SoVI, Cutter and her colleagues showed the relative overall social vulnerability of each county in the United States. Their findings indicate that the most vulnerable counties, with a few exceptions, are located in the southern half of the United States (Cutter et al. 2003). However, this study neither derived nor compared populations that might be displaced. Nonetheless, the usefulness of this model has been amply demonstrated by its continuing evolution, in particular to account for the intersection of coastal erosion and social indicators (Boruff et al. 2005), and to make decadal comparisons of social vulnerability of Katrina-ravaged coastal counties (Cutter and Emrich 2006).

Another index, the Vulnerability Score, was developed at the Center for Hazard Research and Policy Development at the University of Louisville by Simpson et al. (2004). This index may be applied to both natural and man-made hazards, and consists of the product of an exposure score and a hazard score. Each of the components used to create these scores represents one or more indicators. For example, the critical facilities component includes measures related to hospitals, schools, wastewater treatment facilities, water treatment facilities, power facilities, and police and fire stations. Simpson is currently working on a Disaster Preparedness Index (DPI), which in turn will support the creation of a Disaster Resilience Index (DRi) (Simpson 2006).

Many of the indicators used by these authors depict typical demographic conditions: population growth rate, median age, gender, race and ethnicity, family structure (average family size and percentage headed by women), median household income, median adult

educational attainment, occupation, unemployment, and special-needs populations, such as percentage of the population age 65 or older. Several other indicators may merit inclusion or greater weighting in indices:

- percentage of population age 18 or less, one measure of the extent of population dependency—households with large numbers of children may have more difficulty finding longer-term housing, given their means and the availability of large rental units;
- percentage of persons living in poverty, a measure of the population that may lack the resources to evacuate or find housing. Moreover, a generalized lack of resources in a community reduces the likelihood that transportation might be supplied by others, that enough cash can be found to purchase gasoline and hotel accommodations or pay a month's rent in advance, and that households will avoid paralysis in the face of danger or act adequately and appropriately. In addition, such communities are often unable to return their lives to normalcy in the period that follows a disaster;
- percentage of households not speaking English at home, a group that will have difficulty understanding instructions and filling out forms;
- percentage of population composed of newly arrived immigrants, who—in addition to speaking a foreign language at home—are likely to be unfamiliar with American laws and procedures and thus less likely to know how to secure housing following a disaster; and
- car ownership, an important factor in a household's ability to evacuate before an event, to escape the disaster area afterwards (assuming the vehicle has not been critically damaged), and to seek resources such as food, shelter, health care, jobs, and the like.

None of the indices currently available captures the full breadth of vulnerability, and the potential inclusion of these variables or others may not, either. Creation of indices is not straightforward, and the results are rarely flawless. Nonetheless, efforts to continue refining both the variables to be included and the factor analyses incorporating them remain essential.

DISPLACEMENT OF LARGE POPULATIONS

Displacement—or the uprooting of people from a home territory—can be temporary or permanent, voluntary or involuntary, and may be a response to physical, economic (Oliver-Smith 2005), or environmental (Kirschenbaum 1996) danger or harm. In the recent past, natural hazards have typically resulted in localized and temporary displacement and only rarely in permanent migration (Oliver-Smith 2005). As a result, literature on displacement of sizeable populations following natural disasters, as well as on the related housing and land (re)development policy implications, is

notably scarce. The more detailed available research focuses on relocation and involuntary displacements because of evictions from public housing (Elliot et al. 2004); hunger (Auvinen and Nafziger 1999); disease (Toole 1995); drought (El Tigani 1995; Wilhite and Easterling 2004); civil wars, ethnic cleansing and genocide (Azam et al. 2002; Pedersen 2002); and mega-development projects or schemes such as dams and ports (Gellert and Lynch 2003) in the developing world. To a large extent, these population dislocations are driven or triggered by pre-impact conditions of landlessness, joblessness, homelessness, marginalization, food insecurity, loss of access to common property resources, and community disarticulation (Cernea 1997).

Within the United States, though, six key events have involved significant involuntary displacement: Hurricane Andrew (Florida—Morrow 2005; Peacock et al. 2000; Sanders et al. 2004), the Mississippi River flood (Iowa, Illinois, Missouri) in 1993 (Changnon 1996); the Loma Prieta and Northridge earthquakes (California—Eadie 1998; Olshansky et al. 2003), Hurricane Floyd (Dow and Cutter 2000; Maiolo et al. 2001) and, now, Hurricane Katrina (Mississippi/Louisiana—Burby 2006; Mitchell 2005). Certainly Andrew, Floyd, and the two earthquakes displaced thousands of households and caused them considerable misery. However, household displacement of this magnitude had been viewed as an unfortunate but rare occurrence that could be handled using a combination of FEMA-provided trailers and vacant housing units in the local market (Eadie et al. 2001). It was not until Katrina had destroyed the Mississippi Gulf coast and flooded New Orleans with 8-10 feet of water, rendering a major city and an entire region uninhabitable, that concerns about long-term displacement of hundreds of thousands of households, perhaps more than a million, lurched onto the foreground.

HOUSING DILEMMAS

The need for temporary shelter following the emergency-response period has traditionally been addressed in one of two ways: by providing households with allowances for prolonged hotel stays (with imposed time limits), and/or by providing trailers and even entire mobile-home parks. Each of these solutions suffers from drawbacks: Hotel stays can become very expensive and are not intended to be real homes. Trailers leave disaster victims in harm's way for later weather events such as the next hurricane season, and their acquisition can create shortages and drive up prices outside the disaster area. Moreover, following a disaster, providing any sort of housing for large numbers of displaced households poses a considerable

logistical challenge and often results in unnecessary land development as well. New housing options are badly needed.

Following Katrina, an innovative architect designed what has come to be known as the Katrina Cottage, a 380-square-foot home built to withstand winds up to at least 150 miles per hour (Gyan 2006). These cottages can be placed in the yard of a damaged home, providing lodging while the owner rebuilds. The cottage has drawn media attention from all over North America.⁴ The cost of a cottage is comparable to that of a FEMA trailer, with the added advantages that the structure will survive most hurricanes and that it can remain on-site as a guest room, studio, or granny flat. It is precisely this potential permanency that initially caused FEMA to refuse labeling the cottage as "temporary" housing (Norris 2006) even though it is far sturdier. However, in May 2006 Congress stripped FEMA of its responsibilities for housing (Alpert 2006), and by December millions of dollars had been granted to Mississippi and Louisiana for pilot projects deploying the cottage (DeSlatte 2006). Nevertheless, as promising as this alternative to trailers seems, it presents a different set of land development issues such as necessary changes in zoning and subdivision regulations.

Housing affordability (or, rather, the lack of it) surfaces as both a pre-displacement and post-displacement problem (GulfCoastNews.com 2006⁵). Even without the destruction caused by natural disasters, the stock of affordable housing continues to decrease nationwide. In most parts of the country, there are already alarmingly long waiting lists for federal rental-housing assistance programs, among which are the Section 8 Housing Choice Vouchers; Section 8 Single Room Occupancy (SRO) Program; Section 118 Supportive Housing for Persons with Disabilities; Section 202 Supportive Housing for the Elderly; and Public Housing. Public programs that might provide funding and other resources for housing construction, repairs, and upgrades suffer from chronic underfunding by Congress (Kogan 2004; Perry and Kogan 2001). Additionally, income support that allows displaced households to rent available housing is often necessary but not readily available.

Inadequacies in federal housing assistance programs are paralleled, in some cases exceeded, at the state level, again due to funding shortfalls as well as competing priorities. Although most states have available a variety of funding programs that can be tapped to address housing-related issues after a hurricane (e.g. federal Community Development Block Grants (CDBG), mortgage revenue bonds, and state housing programs such as Florida's State Housing Initiatives Program (SHIP)), there is typically little understanding

of what is needed or of what resources are available or can be generated.

Yet Comerio (1997) points out that since 1989 earthquakes and hurricanes in the United States have caused housing losses on the same scale as those typically experienced in disasters in underdeveloped countries. Hurricane Katrina made it clear that we can no longer dismiss the housing needs of populations displaced by disaster. Furthermore, we now know that housing markets in communities far from disaster sites can be impacted significantly, as soaring prices in Baton Rouge demonstrated within two weeks of Katrina (Opdyke 2005). Based on extensive involvement in long-term planning efforts following the Northridge and Kobe earthquakes, Olshansky warns that it takes communities five to ten years to fully recover from a major seismic event (Mitchell 2005). At present, there is no telling how long New Orleans will need to stabilize its population, resuscitate its economy, and rebuild or replace flood-damaged housing.

As defined by Quarantelli (1995), post-disaster housing recovery encompasses four components that appear in succession: emergency shelter, temporary shelter, temporary housing, and permanent housing. During the emergency (response) period, county governments rarely have the capacity to help displaced persons seeking or needing housing or housing assistance. As a result, these governments must partner with private, non-profit and faith-based housing providers to confront and address such needs. According to Salins (1987), the practical dimensions of doing so involve several associated activities:

- identifying in advance the geographically closest available temporary or emergency housing, or—in its absence—providing it;
- providing the transportation needed to move evacuees to temporary housing;
- reducing the waiting period prior to moving displaced persons into temporary housing;
- providing access to information and resources that can assist evacuees in making the transition to recovery, including assistance in contacting relatives; and
- identifying facilities or services that can be made available to help evacuees deal with the immediate impacts of displacement, especially psychological and physiological issues.

As the disaster recovery period lengthens, temporary housing can begin to take on a permanent character, even if the housing is not suitable for long-term habitation. This remains a concern of many planners and policy makers (Schwab et al. 1998), particularly in hurricane-prone areas where victims may be provided

with travel trailers instead of full-sized mobile homes. Finding sites for temporary housing can be difficult as well, and can lead to leapfrog or other undesirable forms of development. More than two decades ago, Bolin (1985) and Quarantelli (1982) urged local jurisdictions to plan locations for temporary housing during the pre-disaster phase. More recently, Olshansky notes that concerns remain about the pace at which housing issues are addressed (Mitchell 2005).

Despite these challenges and concerns, the underlying assumption remains that housing will be provided in the general vicinity of the disaster and that minor updating of zoning regulations, combined with adequate financing, can allow most housing needs to be met adequately. However, what little experience we have with this issue indicates that this is typically not the case. Efforts to address long-term housing needs may face obstacles such as environmental constraints, growth containment policies, or even a shortage of buildable or otherwise vacant land, especially in mature communities (Eadie 1998). At present, temporary housing consists almost entirely of mobile homes (or smaller travel trailers) provided by FEMA and vacant rental units within commuting distance of the affected area.

The most common long-term choice after urban earthquakes has been repair or reconstruction of homes on the same sites (Federal Emergency Management Agency 2005; Mileti and Passerini 1996). The same is often the case following major hurricanes⁶. However, to the extent that dwelling units are located in particularly hazardous locations such as on barrier islands, such replacement may serve the best interests of neither the homeowner nor the community in which they are located. Moreover, owners of decimated rental housing often collect their insurance payments without rebuilding, as occurred in the wake of Hurricane Andrew (Morrow 2005). This scenario is now being repeated on the Gulf Coast (Whoriskey 2006).

DECISIONS TO RETURN TO THE DISASTER AREA

Proximate environmental hazards (either natural or technological) and personal and communal perceptions of risk influence residential decision making by shaping the desirability of particular locales (Hunter 2005). Mileti and Passerini (1996) note that patterns of culture, social organization, and sociopolitical conditions also play roles in relocation and reconstruction decisions. For example, Kirschenbaum (1996) assessed disaster-risk perception of residents in Haifa, Israel after a gas-farm disaster. He found that decisions to relocate during the post-disaster period were shaped by several factors, including:

- Neighborly relations—residents who had good relationships with their neighbors before and after the disasters were less likely to relocate;
- Close proximity of households—heads of household living in more-dense residential buildings were found to be less likely to relocate than families in single- or dual-family housing;
- Car ownership—car non-owners indicated less desire to relocate than car owners; and
- Potential psychological damage to young children—concern for children’s mental health served as a catalyst in the decision to move to a safer place.

A focus on the United States, however, reveals a general lack of research on why populations displaced by natural disasters choose to return or not to return to the disaster area. Nonetheless, both Bolin (1985) and Maltais et al. (2001) argue that redevelopment experts should be sensitive to the problems that can be created if displaced persons make decisions too hastily. Consideration must be given to short-term changes in their mental health status, access to financial and other resources, and the condition of the disaster area. Individual and household decisions can begin to form during the emergency response phase, when linkages to extended family are generally strengthened (Mileti 1999). Mileti warns, however, that poorer families (typically ethnic and racial minority groups) and rural families are less likely to receive extra-familial aid and assistance. Uprooting of low-income elderly populations from the social networks and health-care systems they depend on can exacerbate physical and mental health problems (Sanders et al. 2004).

Disaster survivors should also be encouraged to become involved in the “place-making” of their reconstructed communities (Kobayashi and Miura 1990). Olshansky further recommends that emergency response personnel and temporary housing providers should work to keep communities and their social and economic networks intact (Mitchell 2005). Such efforts can go a long way toward what Oliver-Smith (2005) envisions as socially reconstituted communities. On the other hand, perpetuating concentrated poverty is often undesirable, thus familiarity probably needs to be balanced against helping households take control of their lives.

Anecdotal evidence gleaned from various television news reports in the aftermath of Hurricane Katrina suggest that historic family ties are important to the desire of many displaced residents to return to the City of New Orleans. In particular, the elderly express confidence—or faith—that everything will return to normal. In an exploratory-descriptive study of older adults (all African American public housing residents) forcibly

relocated after Hurricane Andrew, 70% expressed a desire to return to their previous homes after repairs were completed (Sanders et al. 2004). This finding points to the importance of assessing previous residential choices in predicting future choices. Although not focused specifically on disasters, Feldman’s (1990) study, which describes how residents form psychological bonds with idealized home environments and how such bonds come to be translated into plans to move from the city to the suburbs offers some useful insights.

SHORT-TERM THINKING VERSUS LONG-TERM PLANNING

To the extent that displaced residents decide not to return to the disaster site, provision of permanent housing may affect other cities and regions. There is every reason to believe that short-term demands for housing will lead decision makers to follow the path of least resistance: construction on vacant land at the urban fringe. Creating adequate housing sites often involves extensions of infrastructure and raises land use issues (Eadie 1998).

Coordinated public policies will be necessary to ensure that displaced families are integrated into new communities as seamlessly as possible and that the communities receive the infrastructure investments they need to support quality community development. Such policies, particularly in coastal states, must guard against unchecked sprawl while simultaneously ensuring that densification, zoning policies, and incentives promote disaster-resistant and sustainable communities (Burby 1998; Godschalk et al. 1998) and minimize long-term risks to human life and property (Mileti 1999).

One promising approach to enhancing both livability and resilience while at the same time curbing sprawl has been labeled “smart growth.” Smart growth directs new development to spatially bounded, pre-designated areas and encourages mixed-use development and renovation of older, sometimes abandoned areas (Barnett 2003; Lucy and Phillips 2006; Smart Growth Network⁷). There are examples nationwide of creative public policies that foster smart-growth development and address pressing housing and infrastructure needs more cost-effectively. For example, legislation adopted in Massachusetts provides incentives for higher-density, mixed-income housing in village centers and near public transportation, and is intended to increase housing supply and moderate home prices without detrimental impacts to the environment (Carman et al. 2003). However, in the press of trying to resettle disaster victims as quickly as possible, initiatives such as this may be insufficient to steer new housing into appropriate locations.

OTHER POLICY DILEMMAS

After the Katrina debacle, it is logical to assume that both future public opinion and government policies will be increasingly alert to the problems of people displaced by natural disasters. As such, political leaders as well as technocrats have a vested interest in mitigating the effects of disaster-related displacement. However, which strategies are most appropriate is debatable because of the ambiguous nature of what might constitute prudent and proper precautionary measures, especially in the realm of housing policy. To address this dilemma, governments at all levels have recently begun to focus on managing the risks associated with disasters. It is not yet clear whether these efforts will touch on policies associated with long-term recovery.

Scholars have long noted that states vary widely in terms of the disaster-related policies they adopt, due in part to political and economic factors and disaster experience (Birkland 1996, 1997, 2006; Godschalk et al. 1998; May 1997; Sapat 2001). Moreover, policy responses to disasters tend to be highly politicized by the urgency of the moment which improves the odds that new policies may be inadequate, dysfunctional, or tainted by hidden consequences. Hence, analysis of the political and policy-related aspects of potential displacement and resettlement of populations is critical.

Preliminary research indicates that some states have been proactive in providing incentives for strengthening existing structures and encouraging adoption of other mitigation measures, while others have been slow to do so. For instance, following Hurricane Andrew in 1992, requirements specifically addressing hurricane resistance were added to the Florida state building code and have been applied in much of the state. In addition, more attention was paid to enforcement. Florida also dedicated funding to assist homeowners in adopting mitigation measures such as the purchase of hurricane shutters after Hurricane Wilma in 2005. North Carolina was much slower to adopt policies during the recovery from Hurricane Floyd in 1999. State planners and scholars of state governance harshly criticized this lag, which the state blamed in part on the lack of local capacity to address housing needs. However, because of the absence of state-based housing policy, local efforts to rebuild in the poorer parts of the state were not only thwarted but became entangled in bureaucratic turf-battles (American Planning Association 2004).

At the federal level, disaster relief and recovery involve a plethora of government agencies committed to a wide variety of often conflicting missions. Agency efforts to meet the needs of disaster survivors must be coordinated to ensure that they have access not only to

shelter but to income support, transportation, and perhaps even job training. One of the ongoing stories to emerge in the aftermath of Katrina had been the plight of the residents who were relocated to a FEMA-created mobile-home park in Baker, LA. Repeated news reports noted that residents lacked transportation to travel to nearby Baton Rouge in search of employment, and that for some months the entire population needed food to be prepared for them because of the absence of a supermarket within walking distance. In addition, their children missed several months of schooling before a transportation plan was developed to serve them (O'Brien 2006; Singer 2006). Without income or income support, people cannot begin to set their lives straight. In addition, many of these transplants have low or no job skills, thus job training to prepare them for the workforce may be needed as well.

Most important, however, was the relocation of FEMA into a new Department of Homeland Security (DHS) in 2003 as a response to the events of September 2001. Centralization and increased control form a common response to organizational difficulties in complex environments (Singh 1986; Smart and Vertinsky 1977), particularly in response to perceived threats (Staw et al. 1981) and in times of war (Colver 1919; Snider 1943). Numerous concerted efforts have been made toward aligning the functions and incentives of the various agencies that became part of DHS, as well as toward improving coordination with other levels of government in preparation for disasters. Several years later, though, the department continues to struggle in its quest for a unified mission and merger of widely disparate organizational cultures (Haynes 2004). Moreover, most of the energy within DHS has been focused on devising a multi-agency command-and-communications architecture capable of supporting an efficient response to terrorist events.

It was thought that creation of a centralized command structure within DHS would result in better coordination and streamlining of the muddle of agency strategies and policies. However, the effects of Katrina laid bare the problems inherent in this approach, which largely fails to recognize that involvement by a multitude of agencies and jurisdictions creates a highly fragmented policy environment resistant to centralized control. Moreover, DHS's focus on terrorism led to neglect of FEMA's mission and the reassignment of its resources (Eggen 2005; Isikoff and Hosenball 2005).

Katrina also made clear that natural disasters and the problems of providing housing for displaced evacuees have taken a backseat for too long. Leaving aside the personal emotional and economic devastation wrought by the hurricane, consider that numerous local housing markets in several states have been adversely affected.

Like the issues involved in responding to terrorist events, the issues related to provision of long-term housing are made more complex when events involve multiple geographic areas or organizations with overlapping responsibilities. Yet decentralization implies relatively more involvement by lower-level decision makers, whose localized agendas expand the universe of urgent recovery goals to encompass issues of housing and urban planning, issues that lie well outside the DHS's concerns.

The problems apparent at the state and federal levels are further compounded by the involvement of numerous other public and private stakeholders. The final result is a highly fragmented policy environment with varying risk preferences and missions. Thus, a full assessment of the economic, logistical, and political implications of any proposed courses of action must take place, both separately and holistically.

CONCLUSION

Recent events and new insights on global warming make this an opportune time for research initiatives that examine populations predisposed to displacement. Other research is needed to explore how and where recovery takes place, dilemmas in providing temporary housing, factors that condition decisions to return to disaster areas following forced absence, and the land development, infrastructure, and market pressures associated with the long-term departure of large numbers of people. Moreover, planners are now promoting the benefits of higher-density living without a full awareness of the implications of such policies on the potential for mass displacement of people, especially renters, from coastal areas.

Research initiatives also need to promote a regional approach to recovery with an eye toward comprehensive and holistic infrastructure development, evacuation planning, shelter allocation, intergovernmental coordination, housing construction and design, land development, business displacement, politics, and public administration. The potential to apply what is learned in the context of major hurricanes to other types of catastrophes (for example, earthquakes, tsunamis or toxic releases) and conjoint events (technological disasters generated by natural events—see, e.g., Steinberg et al. 2004) deserve attention as well.

To date, much of the empirical research has focused on development of indices to identify places and populations that are likely to be vulnerable to shocks. Although indices are extremely useful, the measurement and development of any index is fraught with methodological pitfalls (Simpson 2006; Stone 2001). Issues in disaster research in particular are subject to

considerable debate on what to measure, how to measure it, how to assess the results, what weights to assign different factors in risk assessment, and a host of other issues (Dwyer et al. 2004; Lloyd and Wilson 2002).

The pursuit of more complete information about potential displacement and its aftermath would benefit from the deployment of two additional important research tools. First, to more fully understand the political, intergovernmental, economic, and social factors surrounding long-term displacement, case studies of individual states and regions should be conducted. This mode of inquiry would allow exploration of factors not captured in quantitative indices, such as the role played by policy/political entrepreneurs; economic issues related to the availability of skilled labor, business assistance, and reconstruction materials necessary for rebuilding; the roles and impacts of social networks; and the responses of federal and state-level political actors. Additional data for the case studies can be drawn from survey questionnaires and focus groups involving disaster victims themselves, as well as from documentary analysis and secondary sources such as regulations, statutes, and white papers.

The second powerful research tool, Geographic Information Systems (GIS) technology, offers several advantages: it can be used to standardize and integrate the indicators from a myriad of sources; it permits rapid comparison of different variables and places; it allows for easy recognition of trends; it can be integrated easily with tabular variables for statistical analysis; and it is an effective platform for presenting social science information to potential beneficiaries outside the research community.

Juntunen's (2005) study of the vulnerability of refugee populations in Clark County, WA offers a good example of both the benefits and drawbacks of using GIS methods. The study's design highlights the benefit of combining GIS-based mapping with findings from focus groups and other forms of participation as a means to assess social vulnerability. It also provides useful insight into the idiosyncrasies of finding and compiling spatial data for mobile population groups. Juntunen warns that even when acceptable data are found, they remain accurate only as long as refugee populations remain in one location—sometimes a matter of only days.

Overall, research on disaster-related housing and social concerns is still largely lacking.⁸ The complex interactions among vulnerability, social relationships, and housing require holistic approaches rather than myopic piecemeal efforts. Many of the factors that can lead to displacement are poorly understood, in part because of our lack of experience with events that cause displacement. Other effects of disasters such as

population replacement, particularly by other racial/ethnic groups, have not been examined. Furthermore, most planners remain inadequately informed about the connections between their routine activities such as land regulation and comprehensive planning, and planning for natural and man-made disasters. In part, this is due to the disconnection between this discipline and emergency planning and management.

For too long, we have regarded major disasters as singular, one-time, localized events, rather than as repeated and typically regional events. Until the scale, complexity, and all dimensions of these concerns are investigated, adequate policy responses cannot be developed, much less implemented. It is past time that as planners, we confront these issues head-on.

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NOTES

1. According to the 2000 Census, the population density of the City of New Orleans was 2,684.3 persons per square mile (compared to an average 102.6 persons per square mile in Louisiana as a whole). Only 46.5% of the housing units in the city were owner-occupied.

2. "Host communities" are localities with large concentrations of displaced residents.

3. Following in the heels of Katrina, Hurricane Rita approached the East Texas coast as a Category 5 storm. Residents of Galveston, parts of Houston, Beaumont, and Port Arthur fled under mandatory evacuation orders, as did other residents of the Houston metropolitan area. Interstate-45 heading north to Dallas turned into a 200-mile-long parking lot on which many vehicles ran out of gasoline, and the trip from Houston to Tyler, which normally requires about three hours, turned into a twenty-hour marathon. To the great relief of both residents and emergency responders, Rita weakened to a Category 3 before making landfall close to the Texas-Louisiana state line, sparing Greater Houston and causing limited loss of life. This scenario would have been vastly different had Rita remained a Category 5 storm and struck slightly to the west.

4. Another small, durable housing unit, the Coastal Cabana, debuted not long after the Katrina Cottage (APX News Ltd. 2006).

5. Gulfcoastnews.com. 2006. *GCN Recovery News Report*, 19 October update. http://gulfcoastnews.com/Katrina/GCN_Local_News_Update.htm (accessed October 19, 2006).

6. Editorial staff, *The Chicago Tribune*. 2006. Clinging to the old Orleans. *The Chicago Tribune*, 31 August, 26.

7. Smart Growth Network. Undated. About Smart Growth. <http://www.smartgrowth.org/about/default.asp?res=1152>. (accessed August 24, 2006).

8. Although a Google search using the Boolean terms "displaced AND persons AND numbers AND United States AND 'natural disaster'" produced nearly 400,000 items, the vast majority were (1) news reports related to Hurricane Katrina or (2) international reports and news, particularly with respect to the December 2004 tsunami in South

Asia. A search through <http://www.myflorida.com> using "housing AND hurricanes" produced information about the homestead (tax) exemption (completely unrelated to disasters), the 2005 Read Together Florida program, Florida's Lemon Law, the Florida Clean Air Act, what happens to lottery prizes that are not claimed, and a variety of other topics, but nothing on housing assistance, temporary housing, or available housing programs.

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