What Affordable Housing Should Afford: Housing for Resilient Cities

Lawrence J. Vale
Shomon Shamsuddin
Annemarie Gray
Kassie Bertumen
Massachusetts Institute of Technology

Abstract

Well-designed affordable housing involves more than the provision of safe, decent, and inexpensive shelter; it needs to be central to the resilience of cities. Framing the issue as a matter of "what affordable housing should afford" expands the agenda for housing designers to consider factors that extend beyond the physical boundaries of buildings and engage the social, economic, environmental, and political relationships that connect housing to cities. To maximize its capacity to support the resilience of cities, affordable housing should engage as many as possible of the following four criteria: (1) support the community social structure and economic livelihoods of residents, (2) reduce the vulnerability of residents to environmental risks and stresses, (3) enhance the personal security of residents in the face of violence or threats of displacement, and (4) empower communities through enhanced capacities to share in their own governance. We illustrate these principles with four examples from recent practice—two illustrating the struggle for everyday affordable housing (in San Francisco and in Iquique, Chile) and two describing the special circumstances that result in the aftermath of disaster (in New Orleans and in Banda Aceh, Indonesia). Taken together, these examples demonstrate what is at stake if we ask affordable housing design to serve the greater goal of city resilience.

Introduction: Linking Affordable Housing to Resilient Cities

The concepts *affordable housing* and *resilient cities* have each attained widespread use in recent years, but their very ubiquity has increasingly moved researchers and practitioners away from consensus

about the meaning of either term. Mentions of affordable housing quickly trigger questions: Affordable for whom? Affordable for how long? What is affordable? Is paying 30 percent of income really an appropriate threshold for defining affordability for everyone, regardless of their income? Questions of politics, policy, and design also apply: Who should be responsible for providing affordable housing—the government, private sector, or nonprofit organizations? How does affordable housing remain affordable? Should affordable housing look the same as market-rate housing—except that residents receive subsidies—or should it be designed, sited, and built differently?

The invocation of resilience raises similar questions about meaning, intent, and application and risks becoming at least as imprecise as "sustainability" has become. Resilience for whom? Against what? Resilience for how long and to what end? Does resilience connote the engineer's notion of bouncing back to equilibrium after a perturbation or does it reflect the ecologist's concern that ecosystem disruption creates dynamic change and may lead to a nonequilibrium outcome? Is resilience instead characterized by the capacity of management to return to business as usual, or rooted in the psychologist's assessment about individual recovery from trauma, or revealed by the homeland security professional's interest in the capacities of networks to resist disruption? It can be all these things and more.

The concept of resilience is increasingly used to describe how well urban areas do or do not respond to crises. Prominent organizations, including international aid agencies and major philanthropic foundations, have popularized the idea of urban resilience and promoted the view that resilience is a condition that cities can aspire to reach.[1] The notion of a resilient city, however, generates questions about who or what counts as part of the city—are whole cities resilient, or merely some parts, some places, some institutions, or some individuals? Given this ambiguity of terminology, the problem may appear to be compounded by proposing to engage affordable housing and resilient cities together. Instead, we argue, using each term to help focus and clarify the meaning of the other offers a way out of this dilemma.

Linking affordable housing to resilient cities forces engagement with these ambiguities and offers an opportunity to sharpen operational definitions. Acknowledging that affordable housing is a major issue in many cities for people across an increasing range of incomes, this article is centrally concerned with what affordable housing affords a city's low-income residents, however such poverty may be measured locally. The article assesses resilience, in turn, in relation to the housing needs of a city's residents in two forms: (1) on an everyday basis, and (2) in the acute form that arises in the aftermath of a sudden disaster. In both contexts, housing becomes an important part of daily life, not only because of its cost, but also because of the access that housing can afford to other attributes of a viable urban life. Specifically, housing can help residents address the struggle to maintain economic livelihood, the threats of a changing climate, the challenges of urban violence, and the inequities of governance. In this way, the affordability of housing is inextricably connected to the resilience of cities.

---

[1] For example, The Rockefeller Foundation initiated the "100 Resilient Cities Centennial Challenge" in 2013 to support cities in dealing with the "increasing shocks and stresses of the 21st century" (http://100resilientcities.rockefellerfoundation.org/pages/about-the-challenge). The United Nations Office for Disaster Risk Reduction launched the "Making Cities Resilient: 'My City is Getting Ready!'" program to address "issues of local governance and urban risk" (http://www.unisdr.org/campaign/resilientcities/about).

By framing the issue as a matter of "what affordable housing should afford," we are seeking to expand the agenda for housing designers. Although it is certainly true that many greater social and economic questions entail separate programs that may take place "off site," out of site should not mean out of mind. Basic decisions about architectural programing and key details of site arrangement can vitally affect the capacity of affordable housing to serve its residents fully and effectively. It is well within the realm of design to keep asking: Design for what purposes? At base, well-designed affordable housing has more to deliver than financial affordability. It should be understood as central to the resilience of cities. Cities as a whole, by the same token, cannot demonstrate the capacity for resilience unless this resilience is rooted in the successful provision of affordable housing to the least advantaged residents. This equity mandate is the link that connects the ideas of affordable housing and resilient cities, which is why we argue that affordable housing must be created in service of resilient cities.

Housing and Critical Resilience

If designing affordable housing for resilient cities is the goal, then it becomes possible to set criteria and seek out exemplars of promising practice. Ideal designs or policies would contribute to traditional conceptions of resilience by making communities better equipped to withstand climate change, security threats, and other disasters, and they would also address overlooked aspects of resilience by making communities more energy efficient, environmentally sensitive, broadly affordable, well managed, socially connected, and physically attractive. It is unreasonable to expect every example to accomplish all these goals simultaneously, but it ought to be the ambition of affordable housing design and designers to contribute to as many of these dimensions as possible. Unless these greater goals are established as central to what it means to design well and effectively, however, they may be treated as secondary to the aesthetic appearance of the housing or falsely seen as outside the purview of a designer's concerns.

The Massachusetts Institute of Technology's newly launched Resilient Cities Housing Initiative (RCHI—pronounced "Archie") is intended to operationalize this quest by drawing attention to a global array of projects and programs that demonstrate ways that housing (broadly considered) can be a positive force for the resilience of cities. To do so, RCHI examines completed residential housing developments and also plans, policies, and programs for housing and housing-related needs. For RCHI, the resilience of cities refers to the capacity of urban areas to adjust and adapt to sudden shocks and longer term disruptions in ways that support and promote the well-being of all residents, particularly the least advantaged. Resilience is understood to be a capability that urban areas exhibit to differing degrees in response to various challenges, as opposed to a fixed condition or state. Shocks and disruptions can take the form of natural disasters, including earthquakes and hurricanes; increasing environmental threats posed by a changing climate; financial downturns, including economic recessions and the loss of local industries or major employers; and political upheaval, including revolutions and wars. In such contexts, the engineer's conception of resilience as "bounceback" is not sufficient, and it can even be misleading. An equity-driven view of urban adaptation insists that cities cannot demonstrate resilience by channeling new investment aimed at the return to some predisruption status quo rooted in the marginalization of low-income groups.

Instead, adjusting to external shocks entails a process of developing a more inclusive society that provides social, economic, and political support for the most vulnerable populations. Indeed, one key measure of resilience is how well low-income groups fare before, during, and after shocks.

The rationale for establishing equity as a core principle of resilience extends beyond the moral appeal of addressing the needs of disadvantaged populations. Low-income groups are often the most vulnerable to socioeconomic, environmental, and political shocks because they are less likely to have a financial safety net to protect themselves from such threats. The aftermath of disasters usually compounds preexisting inequality, which can lead to the economic dislocation and social isolation of residents and, in turn, generate additional neighborhood disinvestment and urban decline. Because of their precarious financial situation, low-income communities can be more expensive for society to reconstruct; therefore, for economic reasons, it is important to ensure that resilience includes marginalized groups. From a political standpoint, the lack of participation, representation, and civic engagement of low-income groups undermines a central tenet of a well-functioning democracy, so equity must be part of a resilience agenda to encourage social cohesion and effective governance. In these ways, the resilience of cities depends on promoting the well-being of disadvantaged populations. In focusing on improving conditions for disadvantaged groups, we adopt an approach that may be called *critical resilience*. Critical resilience entails a willingness to seek ways to "bounce forward," not merely bounce back (Davoudi, 2012).

Applied to affordable housing for the poorest residents, a critical resilience lens suggests an important distinction between resilient housing and housing for resilient cities. These terms, which perhaps sound similar, carry quite different implications for residents and their connection to society. A notion of *resilient housing* can be entirely internalized to a work of architecture and focused on tectonics and structure, whereas *housing for resilient cities* forces the designer's attention into larger urban realms. For example, the design of a disaster-resistant residential building could result in a heavily fortified bunker that is completely sealed off and impervious to the elements, thereby affording significant protection to occupants from the immediate effects of hurricanes, floods, and earthquakes. Although the building's rigid structure may better withstand natural disasters, its inflexibility may prevent it from adjusting to changing environmental conditions and threats. In addition, the form of the building may isolate occupants from social networks and relationships with other urban residents. Of even greater consequence, perhaps, decisions that are driven primarily by a view of resilience premised on hardening buildings against future threat may easily tip into decisions that alter existing land uses in ways that harm the livelihoods of low-income residents. After the Asian tsunami of December 2004, for instance, governments in Sri Lanka and elsewhere opportunistically sought to use the destruction to replace flimsy shacks occupied by fishermen with more sturdily built luxury hotels constructed out of concrete (Klein, 2007). Their goal was resilient housing that could accommodate wealthy tourists, rather than housing that could support a low-income community as part of a more resilient city.

Although it is certainly important that affordable housing be architecturally resilient in the sense that it enhances the bodily safety of its residents, bodily safety is hardly sufficient. It stops well short of meeting the greater agenda of housing for resilient cities. To address this broader mission, housing must be conceptualized more holistically as a way to help low-income residents cope with four simultaneous challenges: (1) the persistence of economic struggle, (2) the dangerous vagaries

of a changing climate, (3) the impacts of urban violence, and (4) the scourges of dysfunctional governance. Housing for resilient cities is housing that provides a foundation for vulnerable groups to develop positive social relationships and economic livelihoods while reducing risks. This goal might be advanced by siting affordable housing in locations that provide ready access to educational and employment opportunities or by incorporating these opportunities into the housing project. Housing for resilient cities is housing that affords residents connections to social systems and resources, which in turn enhances the broader community's capacity for resilience. In addition, it is often housing that supports and encourages social inclusion and cohesion by bringing together people from different racial and economic groups.

A Framework To Analyze Housing for Resilient Cities

RCHI seeks to develop and disseminate a broader framework for understanding resilient cities by developing a repertoire of exemplary practices that can clarify the relationship between affordable housing and resilient cities.[2] This process entails looking at both the everyday challenges of providing stable housing that fosters healthy lives and remains affordable to low-income residents and at ways to cope with immediate and longer term housing needs after sudden disaster, including the need for shelter and personal safety. Housing solutions that support the resilience of cities can be found in a variety of market conditions, ranging from rapid growth and urbanization to abandonment and decline. Affordable housing that affords opportunities to enhance the resilience of cities can be located both in the United States and all over the world. Whether low-income households face everyday struggles or emergency problems, and whether they cope with the pressures of increasing urbanization or the disinvestment associated with urban shrinkage, affordable housing can support resilient cities. To do so, affordable housing design needs to encompass a broader view of what design affords. To maximize the capacity of affordable housing to support the resilience of cities, its advocates must ask it to engage as many as possible of the following four criteria (exhibit 1).

1. Support the community social structure and economic livelihoods of residents.

2. Reduce the vulnerability of residents to environmental risks and stresses.

3. Enhance the personal security of residents in the face of violence or threats of displacement.

4. Empower communities through enhanced capacity to share in their own governance.

We consider each of these criteria as a way to broaden the definition of what ought to constitute good design, and we seek to document the ways that collaborative planning processes can contribute to this larger set of contextual outcomes.

---

[2] For details about RCHI-sponsored lectures and symposia, see http://rchi.mit.edu.

Exhibit 1

Elements of Affordable Housing for Resilient Cities

Source: Authors

This intent to treat the design of affordable housing as encompassing far more than buildings is consistent with many emergent and contemporary practices. This embrace of larger scales and more integrative approaches is the difference between Leadership in Energy & Environmental Design (LEED)-accredited buildings and the broader notion of LEED for Neighborhood Development (LEED-ND). It is also the difference between the U.S. Department of Housing and Urban Development's (HUD's) HOPE VI (Housing Opportunities for People Everywhere) approach to public housing redevelopment, focused chiefly on the land controlled by a public housing authority, and HUD's more all-encompassing community development of the Choice Neighborhoods initiative. The goal of affordable housing for resilient cities is likewise consonant in spirit with the National Low Income Housing Coalition's notion of Housing Plus Services and the Urban Institute's concept of Housing Opportunities and Services Together, or HOST, which asks, "Can public housing be a platform for change?"[3]

"Affordances" by Design

Before moving on to consider how housing design may be extended into the realms of economic, social, and political life, it is worth pausing to consider some of the ways that design operates. At one very important level, affordable housing design is about the aesthetics of the residential living environment, which has many dimensions. Design plays an important and immediate role in the appearance of affordable housing, which can influence how low-income areas and their residents are perceived by neighbors and by the broader public. Designers of early U.S. public

---

[3] See http://nlihc.org/issues/other/hps and http://www.urban.org/url.cfm?ID=412965&renderforprint=1.

housing deliberately conceptualized it using modernist design and site planning so that it would look as different as possible from the rickety coldwater flats and narrow streets of the slums it replaced. New Urbanist alternatives to public housing similarly (if ironically) have emphasized the difference between the neotraditional urbanism of street-fronting townhomes and the discredited modernist towerblocks and superblocks of the earlier model. In the United States, affordable housing is increasingly designed to look like market-rate housing (especially if it is intended to attract a mix of incomes); this practice ostensibly helps avoid the stigma that low-income residents are different and do not belong (Vale, 2013, 2005).

The aesthetics of housing design are also tightly bound up with questions of *programming*. Programming entails important decisions about the mix of unit types, which in turn markedly affects who becomes the intended residential constituency. In a mixed-income setting, housing design can ensure that individual units are similar in terms of materials, quality, and size for all income levels and also can provide multiple-bedroom units for larger families. Housing each income group in a distinct manner or location, on the other hand, can signal differences between people that might not otherwise be so apparent. When projects seamlessly provide a spectrum of affordability, they sometimes can accommodate changing economic circumstances and minimize the social dislocation, homelessness, and social disorder that can arise from economic shocks. Multifamily housing design can also engage local artists in ways that capitalize on site-specific attributes and remain attentive to the ethnic traditions of likely residents. Programming also determines the nature and extent of nonresidential uses, and these sorts of facilities often have a great effect on the overall social and economic character of the neighborhood. Site planning and programming can also express design intentions related to civic engagement and participation. Projects can be designed to engage, enhance, and interact with the surrounding urban context, for example, by reintroducing the street grid or establishing strong street frontage, including ground-floor community centers, retail, or other public uses. The urbanistic goal of such multifamily housing is to maximize connectivity and openness, consistent with the need to also maintain security. This need to achieve a balance between community and privacy, while cultivating a layered sense of semiprivate and semipublic territories that mediate between the fully private and fully public, have been hallmarks of good design for a long time (Chermayeff and Alexander, 1965; Newman, 1972).

As implied by the issues of mixed-use site planning and public-private relations, design decisions can contribute in multiple ways that may prove valuable to low-income residents. How might design make it more likely that people will get jobs? How can design reduce the vulnerability of low-income households to the effects of climate change? How can it promote healthy lifestyles, enhance security, or enhance the probability of community engagement? At every turn, design decisions in particular places have made each of these outcomes somewhat more likely or—all too often—somewhat less so. In the rush to avoid the usual charges of environmental determinism, it is also vital to avoid making the opposite mistake. We should not overlook the power of design decisions. They may not be determinative of behavioral choices, but neither are they irrelevant. Some design decisions do make certain behavioral options more—or less—likely.

Urban design scholar Jon Lang usefully adapted the notion of *affordance* from psychologist James Gibson to help designers conceptualize "the link between the built environment, human behavior, and values and needs fulfillment" (Lang, 1994: 165). Applied to housing, this term suggests that

housing environments—especially if broadly considered—are connective spaces that link residents to broader sets of opportunities or, if poorly designed, act to restrict them. As Lang (1994: 165) put it, "Any pattern of the built world affords certain activities or aesthetic interpretations. These patterns enlarge or constrain our options for behaviors—physical and mental—depending on the overall conditions and properties of the layout of the built environment."

Designing affordable housing for resilient cities goes well beyond architectural design and site planning, and entails broader engagement with—

• Neighborhood design and context.

• Institutional programming.

• Environment and infrastructure systems.

• Long-term affordability.

• Neighborhood security.

• Livelihood support and services.

• Social organization and community.

• Transportation networks and accessibility.

In what follows, we set out four examples that illustrate how affordable housing can be marshaled in support of a broader approach to resilient cities. We do not claim that these examples represent wholly successful achievements, but they do raise the bar for what ought to be considered possible. Each reveals that design and planning are not about one-off proposals that are either implemented or not. Instead, each case reveals the complexity of the contested and negotiated struggle that necessarily results from undertaking an ambitious agenda. From public housing redevelopment in Northern California to incremental low-income housing construction in northern Chile, we can see how affordable housing design affords many other things. From neighborhood recovery in post-Hurricane Katrina New Orleans to the challenges of the post-tsunami devastation affecting Banda Aceh in Indonesia, it becomes possible to situate housing in the realm of greater human needs and aspirations. These four examples—two illustrating the struggle for everyday affordable housing and two describing the special circumstances that result in the aftermath of disaster—demonstrate what is at stake if we ask affordable housing design to serve the greater goal of city resilience.

North Beach Place: Maximizing What HOPE VI Affords

San Francisco's North Beach Place, a HOPE VI mixed-use and mixed-income redevelopment project that opened in 2005, began life in 1952 as a 229-unit public housing development. This development, in turn, had replaced a low-income industrial and residential area in a predominantly Italian neighborhood near Fisherman's Wharf, a neighborhood that had been devastated by the earthquake and fires of 1906. A development initially occupied overwhelmingly by White residents (which led to a landmark racial discrimination suit in the 1950s), North Beach public housing gradually became highly diverse, with substantial African-American and Chinese populations.

Given that this housing development had been located on either side of the terminus of a major cable car line, huge numbers of tourists attempting to reach Fisherman's Wharf found themselves, by the 1980s, disembarking in a dangerous and crime-ridden project uneasily located just across the street from several upscale hotels.

Rather than join in the frenzy of high-end, market-rate development sweeping San Francisco (and sweeping out its lowest income citizens), the city's strong nonprofit housing community—joined by empowered tenant groups and supported by then-Mayor Willie Brown, who wanted to see the stigma of the project removed—embarked on a public housing redevelopment effort that would preserve and enhance the last remnants of affordable housing in an otherwise gentrifying neighborhood. Developed as a public-private partnership that included nonprofit BRIDGE Housing and the for-profit John Stewart Company and Em Johnson Interest Inc., the San Francisco Housing Authority (SFHA) engaged in a highly unusual variant of HOPE VI. The development process unleashed by the HOPE VI grant not only replaced all 229 low-income public housing units on site, it also added 112 additional affordable housing units (by leveraging low-income housing tax credits, or LIHTC), a new supermarket, additional below-grade parking, and new street-level retail (exhibit 2).

Viewed holistically, North Beach Place affords its residents far more than low-rent housing; it affords them access to a thriving neighborhood with abundant jobs. This housing makes San Francisco more resilient, because it enables the city's economy to retain more of its low-income workforce. As housing, the redevelopment preserves 229 apartments with the kind of deep subsidies that make them available and affordable to public housing residents with extremely low incomes (which averaged only 17 percent of Area Median Income, or AMI, when the HOPE VI venture was launched). It also adds markedly to the overall affordability of an otherwise gentrified area through the inclusion of the LIHTC funds to create the 112 extra onsite units intended to be affordable to those working households earning approximately 50 percent of AMI.

Exhibit 2

Exterior View of North Beach Place, San Francisco, California

Source: Lawrence J. Vale

North Beach Place, importantly and by design, does more than provide better housing for low-income residents. By contrast with many other income-mixing efforts that seek to remove low-income residents from newly desirable areas of cities, this effort is an exercise in building the resilience of cities in ways that benefit *all* inhabitants, rather than only those who are most economically attractive to developers. Approximately 36 percent of the original tenant households returned after redevelopment (not an obviously impressive figure, but about twice the HOPE VI program norm), but many others preferred to retain their housing vouchers for use elsewhere in the city or region, and others shifted to housing projects for seniors. Some erstwhile tenant leaders evinced resentment about the difficulty of returning, but no one could deny the importance of having retained every single one of the original North Beach public housing units for low-income occupancy while also increasing the number of three- and four-bedroom apartments available at the development. At a time when the premise of most HOPE VI redevelopment efforts was reducing the number of public housing units and displacing many residents, the proponents of North Beach Place, prodded by residents, remained committed to serving the city's least economically advantaged. This dedication to the underserved, reflecting a capacity to develop policy based on community engagement, highlights the basic equity component of housing for resilient cities. Returning North Beach's public housing to desirable occupancy by those with the lowest incomes makes San Francisco more resilient because the least advantaged are the ones most affected by shocks, which can have ripple effects on the rest of the population.

The design of North Beach Place affords its residents (and its neighbors) important aspects of each of the four resilient city criteria we have outlined: support for socioeconomic livelihoods; reduction of environmental risk; enhancement of personal security; and creation of new opportunities for community empowerment. To be sure, some fulfillment of these criteria has remained more in the realm of aspiration than achievement, but the latter is not possible without the former.

In terms of livelihood enhancement, the HOPE VI application promised a strategy that would provide "every resident… the opportunity to achieve self-sufficiency through education, employment and entrepreneurship" (SFHA, 1996: E-23). The team proposed a variety of childcare, education, and job training programs and—in keeping with the favored HUD terminology of the day—called for a "Campus of Learners" focused on classroom space devoted to improved computer literacy and job readiness (SFHA, 1996: 23–32). It would be an exaggeration to say that all these programs have been fully realized or consistently funded, but they have certainly made some notable progress for some residents. More successful than the bold but elusive promises about self-sufficiency, the provision of street-level retail has provided a substantial revenue stream to support services for North Beach Place tenants—even though it has never yielded the once-envisioned opportunities for resident-owned business incubator space. The basic decision to reinvent North Beach Place as a mixed-use residential and retail environment likewise provided residents, neighbors, and visitors not only convenient access to another supermarket, but also access to a variety of new jobs, even including a few training and employment opportunities in the construction industry.

In terms of reducing environmental risk, the new construction of North Beach Place, by complying with the latest seismic standards, affords its residents a much greater degree of earthquake protection in a place where earthquakes are a significant issue. As the initial HOPE VI application framed it, "The seismic safety of North Beach is a major concern," noting it that it "sits on bay mud

deposits, similar to the unstable soil in the San Francisco Marina District which saw devastation in the 1989 Loma Prieta earthquake" (SFHA, 1996: B-5). Living in the old project also carried risks of exposure to "high levels" of lead paint and friable asbestos, and residents suffered from deteriorated sanitary distribution lines and a nonfunctional site drainage system (SFHA, 1996: N-3), which the new construction has solved. North Beach Place is far enough inland to be at relatively low risk for flood damage,[4] but the design concept of raising most of the residential portion of the development onto a plinth above a ground-floor level of surface parking represents a plausible protective strategy for more flood-prone site conditions elsewhere. The plinth served several resilience-enhancing design purposes simultaneously: it permitted inclusion of the supermarket and the off-street parking needed to support it, artfully met the pragmatic need to turn the constraint of a hillside topography into an opportunity, and offered multiple ways to enhance security.

Security—for residents, for neighbors, and for visitors—is an important part of the extended mandate of high-quality design of affordable housing. When the SFHA applied for HOPE VI funds, they described "the biggest barrier to integrating North Beach into the neighborhood" as the "lack of safety resulting from its obsolete design" (SFHA, 1996: A-1). As an alternative, proponents envisioned—and then delivered—a new design that created "defensible space in the tradition of Oscar Newman," specifically addressing the problems that make it "'unpoliceable' according to the San Francisco Police Department and Project SAFE" (SFHA, 1996: A-1). Before redevelopment, the SFHA noted that "the open air corridors, unprotected courtyards, open parking lots and unenclosed stairways invite purse snatchers, muggers, car thieves and drug dealers who run through the development, terrorizing tourists and residents alike" (SFHA, 1996: B-6). SFHA described a place that the police could not secure because "there are too many places to run and hide" (SFHA, 1996: B-6). Instead, the HOPE VI team promised to improve security for both residents and visitors.

Some of this security comes from the informal resident surveillance of semipublic and semiprivate space immediately outside apartments, aided by entrances facing both the street and landscaped courtyards (exhibit 3). Security is also a matter of ongoing investment, however. The John Stewart Company, which served as codeveloper of North Beach Place and remains its site manager, spends $25,000 per month on security, much of it connected to the operations of 39 cameras (Stewart, 2013). Although direct, street-level entries to apartments are on three sides of each block, most access to the complex is through gated portals leading to a semiprivate entry zone providing access onto the courtyard plinth. As Stewart described it,

> What we really have is an entry barrier from the street. And I think a good entry design, because it doesn't look Orwellian, even though there's a camera there. Then we have the entry to the building and the entry to the apartment. You've got three barriers before somebody gets into your unit. (Stewart, 2013)

Interviews with more than 25 past and present residents, however, yield a much more mixed interpretation of the cameras. Residents frequently regard the ones in the courtyard as intrusive, an extension of rule enforcement that families with young children find to be particularly onerous and incompatible with children's play. As designed space, they view the courtyards as planted for

---

[4] See http://www.sfgsa.org/Modules/ShowDocument.aspx?documentid=1783.

Exhibit 3

North Beach Place Courtyard, San Francisco, California

Source: Lawrence J. Vale

display rather than use, especially given the prohibition on activities such as barbecuing, ball playing (even with soft NERF® balls), and bicycling. The same basic design decision that generated a relatively secure gated perimeter also yielded interior space that is acoustically problematic; all sights and sounds are shared. This version of the Jacobsian ideal—"eyes on the court"—seems a mixed blessing at best. Still, it remains the case that the new North Beach Place is, and is perceived to be, much safer than its predecessor. Although many residents understandably chafe at a perceived excess of rules or surveillance, the development has been designed deliberately to maximize the contrast with the pre-HOPE VI, free-to-all access that made the North Beach project such an easy and tempting escape route for the muggers who preyed on tourists waiting for cable cars adjacent to the development. As one resident succinctly put it, "Right now, it's safer, but is less free for people; everything has its yin-yang" (North Beach resident interviews, 2009–2013).

For the street-level apartment entrances, Stewart observed that the designers and developers took a gamble, because those same four-bedroom units also had an entry from the interior patio one level up. "It's always been true that if somebody wanted to they could open their door and let a person in and they could get up into the interior" (Stewart, 2013). The management, presumably with little choice, decided to trust the residents: "We'll just have to rely on the people to be defensive themselves. And we have not had a problem there with people streaming in" (Stewart, 2013).

This view from management evinces an underlying ambivalence, even a lingering paternalism, something also noted by many residents. For their part, many Chinese residents remain mistrustful of African-American youth who loiter outside the development; one interviewee commented that her family will not even use the street-facing front door; they prefer to enter through the gate and courtyard. As one final design item that was instead really about community security, the team decided to outfit each family's apartment with an expensive stacked washer-drier. In surveys conducted before redevelopment, residents demonstrated that their biggest concern in public housing had been personal security, so they greatly appreciated not having to bring money to a communal laundry room (Stewart, 2013). In interviews conducted after redevelopment, residents confirmed that they very much appreciate this convenience.

Resident activism, aided immeasurably by multiple community organizations and legal assistance teams, yielded many victories, although the residents' struggle was long and hard fought, and their victories no more than partial. The residents and their allies notably obtained the guarantee of one-for-one onsite replacement of 229 deeply subsidized housing units, but they did not get everything they wanted. They had sought (and initially had been promised) a multiphase construction process that would have enabled many of them to remain on site without the need for temporary relocation. Some residents unsuccessfully lobbied against having the additional tier of tax-credit units added to the site plan, arguing that the development should be reserved only for those of the lowest incomes. They also did not make much progress on the idea of having a resident management corporation take charge of many aspects of the development's governance. The residents—together with their activist allies—nonetheless made certain that the new North Beach Place would remain a place serving primarily those with the lowest incomes. Aided by a sympathetic HOPE VI team that listened to residents when formulating an original proposal that boldly stated that no loss of units would occur, and supported by a variety of neighborhood organizations eager and able to help tenants maximize their rights, the process of designing and developing North Beach Place can be seen as, overall, an exercise in community empowerment and capacity building.

Quinta Monroy: Using Incremental Approaches To Afford Infrastructure and Housing

Efforts to develop low-income housing that extends support well beyond housing are even more common outside the United States. The need and opportunity to address broader urban resilience through housing is particularly salient in countries that face extreme deficits in water and sanitation infrastructure provision. For example, architects, residents, and policymakers in the middle-income country of Chile have developed models of incremental housing in tandem with infrastructure improvements for low-income families in informal settlements in areas of risk. These programs build on longstanding government efforts to provide urban housing and on citizen activism through land occupation and the establishment of informal settlements. Starting in 1906, the Chilean government passed legislation to create Workers' Housing Councils to address low-quality housing by developing housing projects for moderate-income households (Rojas, 1999). In the 1950s, "self-help" housing policies offered technical assistance to encourage households to use their own labor to construct housing (Greene, n.d.; Jiron, 2010). The government shifted responsibility

for production by enacting laws that created incentives for private-sector investment in housing development. The Ministry of Housing and Urban Development (MINVU) was created in 1965 to oversee the use of public funds to build housing for lower income households, coordinate the efforts of different government entities, and help establish more consistent housing policy (Rojas, 1999). MINVU addressed concerns about the supply of affordable housing by managing private firms' construction of housing units that were then sold to households using direct subsidized loans. In recent decades, the government has also introduced policies to address demand-side challenges. In 1977, the Chilean government pioneered the approach of giving low- and middle-income families upfront capital subsidies to be used in combination with private financing to purchase homes built by the private sector (Gilbert, 2004). The creation of savings and loan associations and the Popular Savings Plan encouraged households at all income levels to save money for housing and used these savings to finance mortgage-backed loans for home purchases (Rojas, 1999).

Despite these efforts, the number of housing units produced was insufficient to meet the need, especially for a rapidly urbanizing population. The urban population increased four-fold, from 3.5 million in 1950 to more than 15.0 million in 2010, which is now almost 90 percent of the total population (Greene, n.d.; OECD, 2013). Urban migration from rural areas combined with natural population growth among urban residents exacerbated housing demand. Citizens took matters into their own hands as they occupied marginal land and formed *campamentos*, or encampments, and *callampas*, or mushroom settlements. Hundreds of thousands of people lived in these informal settlements in urban centers and peripheral metropolitan areas (Jiron, 2010). The settlements were characterized by insecure land tenure, dirt floors, and a lack of potable piped water and sanitary disposal of waste water. According to national surveys, one-fourth of all houses experienced overcrowding, and nearly one-half of those occupied by the poorest residents were overcrowded (Micco et al., 2012). Early government efforts to eliminate informal settlements resulted in displacement and forced relocation to areas with inadequate infrastructure.

In this context, experiments with incremental housing strategies in Chile offer an example of addressing infrastructure challenges when building housing for resilient cities. A housing development in Quinta Monroy (exhibit 4), in the northern city of Iquique, represents one part of an evolving process in which designers, policymakers, and residents learn from experience. In 2003, the Chilean government contracted with Elemental, a prominent Chilean architecture firm, in partnership with Pontifícia Universidad Católica de Chile, a private Catholic university in Santiago, and Empresas Copec, a Chilean energy and natural resources company. The objective was to provide housing for nearly 100 families on a 1.25-acre site in the central city, where residents had been living in informal settlements for 30 years. Faced with insufficient funds to build complete houses for every family, the firm proposed a design based on incremental construction of housing over time by residents. The design of the half-built home featured basic structural elements (roof, walls, and stairs) and infrastructure (kitchen, bathroom, and connections to utilities). Residents would add to this basic unit over time based on their family structure, changing needs, accumulated savings, and access to financing. The architect Alejandro Aravena noted, "The design is packaged first in identifying which is the half that a family will never be able to modify over time, no matter how much time, money, or energy they spend on their houses. And simultaneously, what design conditions will guarantee that house will gain value over time" (Aravena, 2008: 1).

Exhibit 4

Incremental Housing in Quinta Monroy, Iquique, Chile

Source: Annemarie Gray

In Chile, the Neighborhood Upgrading Program and related initiatives have sought to formalize informal urban settlements by developing physical infrastructure and social services. In the 1970s, a program was created to build basic sanitary units, consisting of a kitchen and bathroom with connections to water service, to address urban health problems (Brakarz, Greene, and Rojas, 2002). The Chile Barrio program, started in 1998, used funding from the national government to provide services, including potable water, sanitation, and paved streets; help secure land tenure; and eventually address poverty by encouraging the provision of childcare, health, and education services (Brakarz, Greene, and Rojas, 2002). As such, the Quinta Monroy project and its successors have served as a 21st century heir to many decades of effort to trigger neighborhood construction through sites and services approaches and, in architectural terms, are intellectual descendants of John Habraken's ideas about "supports" as "an alternative to mass housing" (Habraken, 1972; Hamdi, 1995; Turner, 1977). It is important to note that the Quinta Monroy effort is not on some distant greenfield site; rather, like the redevelopment in San Francisco's North Beach, it permitted an established community to remain rooted in place.

Critiques of the Chile Barrio program as a whole emphasize the tendency toward relocation in siting decisions and a lack of understanding of quality-of-life factors that go beyond the physical quality of housing (Jiron, 2010). Although the Quinta Monroy project was funded through the Chile Barrio program, the architects specifically emphasized the need to build new housing on the same site as the informal settlement to ensure families remained integrated into the network of

opportunities the city had to offer (Aravena, 2008). The families at Quinta Monroy had been living there for three decades and had developed strong local ties, social capital, and a sense of community during that time. Because the informal settlement was in the center of the city of Iquique, it had good access to transportation networks, healthcare services, educational institutions, and employment opportunities. This siting decision helped preserve and strengthen the social networks embedded in the community and the existing links to jobs and other income-generating activities.

The new construction of incremental housing also helped reduce the vulnerability of residents to environmental risks and stresses by improving the physical structure and safety of their dwellings and by enhancing personal security. Incremental housing replaced informal settlements that were built using found or cheap materials, subject to fire hazards, and rarely constructed according to building codes. The risk of building collapse was a major concern in the Quinta Monroy project given the seismic activity in Northern Chile. The incremental housing was designed around a strong structural core, made of concrete and cement blocks, that was engineered to support additional construction over time. The project resulted in structurally sound building construction that was resistant to earthquakes and flexible enough to accommodate residents' needs and changing conditions.

Empowering communities through enhanced capacities to share in their own governance remained a key theme throughout the project. Architects used a participatory approach to engage residents in creating designs for their housing and to build a sense of ownership in the project. The incremental housing design relies on residents to take an active role in developing and adding to their homes, which can be a source of empowerment. A recent visit to the site reveals that most of the buildings have customized additions, which reflect the investment of time, money, and other resources that residents have made in their homes. Residents also benefit from the increased value of their house as a financial asset. According to Executive Director Alejandro Aravena, every house in the Quinta Monroy project was valued at more than $20,000 5 years after construction (Aravena, 2011).

Few formal studies have evaluated the extent of the participatory process at the Quinta Monroy project. Research has emphasized that, nationally, the Chile Barrio program fell short in its lack of resident participation and local control of the housing projects it built, as reflected in a lack of sense of ownership and an overall dissatisfaction with projects over time (Jiron, 2010). Although more research is needed to fully understand the extent and effect of resident participation in the Quinta Monroy project, the existing documentation of participation and the strong emphasis on retaining social and economic integration with the city suggests that Elemental's approach was unique in the context of national housing strategies for informal settlements.

The Quinta Monroy project in Chile represents one phase in an evolving process of learning how to address the housing and related infrastructure needs of low-income urban residents through incremental housing design. Elemental has completed more than 14 projects to date, with a handful of others in progress in other Chilean cities and other Latin American countries. Exhibit 5 shows the group's second incremental housing project, Lo Espejo. Each project retains its signature design features—structural shell, critical interior amenities, basic infrastructure, and designated public space—adapted to the individual size, geography, and budget of each project. Funding has expanded in more recent projects, and subsidies have allowed for incremental additions to be built at the time of original construction. Government partnerships with nonprofit organizations, like Un Techo Para Chile (A Roof for Chile), helped provide essential services to residents on site in

Exhibit 5

Elemental's Lo Espejo Incremental Housing Project, Santiago, Chile

Source: Annemarie Gray

recent projects. Public funds were used to build childcare and job training facilities managed and operated by local organizations. These services helped residents find jobs and earn incomes that they could use to improve and expand their homes.

The project architects and policymakers have taken the lessons from Quinta Monroy and applied them to other incremental housing interventions in Chile and other countries. The approach—identifying what architects can design up front and what residents can build later—remains consistent, but the actual pieces have been adapted to respond to government funding, local climate, cultural context, and physical site constraints. Although careful evaluation of these projects is still needed, the case of incremental housing suggests that affordable housing should afford flexibility in its design, production, and use and should be conscious of the need to provide basic structure. The case also shows how the challenge of developing infrastructure can be transformed into an opportunity to build low-income housing that contributes to urban resilience.

Village de L'Est: Affording the Return of a Community After Disaster

A third example illuminates another important dimension of what affordable housing can afford by demonstrating how local institutions can develop community capacity and support housing for resilient cities in the context of postdisaster reconstruction. The Village de L'Est neighborhood, in the eastern section of Orleans Parish, Louisiana, is in the southern part of a drained marshland bounded by Lake Pontchartrain and Chef Menteur Highway. The construction of residential and

commercial buildings on what were previously wetlands has contributed to subsidence problems over the years. The neighborhood is one of two in New Orleans East, a 32,000-acre development consisting mostly of suburban subdivisions built in the 1960s that was considered at the time to be the largest land parcel in the corporate limits of a major U.S. city held by a single owner (GNOCDC, 2002). Village de L'Est opened in 1964 as a 600-acre tract consisting of mostly one- and two-family houses and some large apartment buildings.

Although it once was a mostly African-American neighborhood, a significant Vietnamese community has called Village de L'Est home since first moving there in the 1970s. The Vietnamese residents of Village de L'Est trace their history to refugee resettlement after the Vietnam War. After Vietnam was divided in 1954 under the Geneva Accords, many community members in the Catholic dioceses of Bùi Chu Phát and Diêm in North Vietnam fled to South Vietnam to escape the threat of religious persecution, and relocated to villages near Vung Tàu and Phúc Tinh in the Bà Ria-Vung Tàu province south of Saigon (Airriess and Clawson, 1991; Leong et al., 2007; Seidman, 2013). In 1975, after the fall of Saigon, the U.S. government and faith-based organizations, most notably the Associated Catholic Charities of New Orleans, helped relocate nearly 1,000 Vietnamese refugees to New Orleans (Airriess and Clawson, 1991; Seidman, 2013). Local organizations and community activists assisted refugees in finding housing at the Versailles Arms Apartments, a 402-unit apartment complex that offered subsidized rent through HUD. By 1990, the Vietnamese population had grown to nearly 5,000 and the Village de L'Est neighborhood had nearly equal proportions of African-American and Vietnamese residents (Leong et al., 2007). Today, the Village de L'Est neighborhood is considered by some to be "synonymous" with the Vietnamese community in New Orleans (Truitt, 2012).

The Mary Queen of Vietnam Church, a focal point for the Vietnamese community in New Orleans East, was instrumental in helping residents return and rebuild their community after the levee failures following Hurricane Katrina caused widespread flooding (Seidman, 2013). The parish, founded in 1985, was led by Father Vien The Nguyen from 2003 to 2010. Before Hurricane Katrina, approximately 75 percent of Vietnamese residents in Village de L'Est identified themselves as Catholic and nearly one-third lived in poverty, which was higher than the rate for New Orleans (Leong et al., 2007; Seidman, 2013). After Hurricane Katrina flooded the neighborhood in August 2005, Father Nguyen tracked where church members had relocated as a result of evacuation and displacement. The church kept members socially connected and eased their return: by 2010, about 75 percent—or more according to some observers—of the pre-Hurricane Katrina Vietnamese community residents had returned to Village de L'Est (Leong et al., 2007; Seidman, 2013).

The rebuilding of Village de L'Est shows promising signs of resilience along several dimensions identified previously. Local institutions, in particular the Mary Queen of Vietnam Church, provided valuable support for community social structure, especially against the backdrop of mismanagement, bureaucracy, and political mishaps. After Hurricane Katrina, Vietnamese community members evacuated the neighborhood and moved in with family and friends all over the country. The church provided a central point of contact that linked the community even while they were physically isolated from their neighborhood (Seidman, 2013). Father Nguyen used the church's organizational structure to stay in contact with members, identify their whereabouts, provide connections to social services, and offer assistance in returning to Village de L'Est (Leong et al., 2007).

Community organizations also sought to improve the economic livelihood of residents by creating business support programs and economic development initiatives. Before Hurricane Katrina, many Vietnamese community members engaged in small-scale agricultural practices to grow a variety of fruits, vegetables, and herbs that typically were not found in New Orleans supermarkets. The form of gardening shown in exhibit 6 reflects the "kitchen gardens" of Southeast Asian villages used for household consumption rather than larger gardens used for commercial purposes. Residents took advantage of local drainage canals for irrigation and developed extensive gardens in their yards and on open land concentrated along the northern edge of the neighborhood, and they often sold surplus crops at a popular neighborhood Saturday market (Airriess and Clawson, 1991). The Village de L'Est Green Growers Initiative, a community member-owned and member-operated farmers' cooperative that was developed in response to the April 2010 BP oil spill, promotes the work of local farmers by encouraging area restaurants and farmers markets to buy produce and other goods from community members. Other initiatives, like the Viet Village Urban Farm—a proposal to incorporate environmental sustainability principles and technologies into local agricultural practices—have not been realized, however (see Truitt, 2012). The church and community leaders sought to support and broaden the local economic base by creating the Mary Queen of Viet Nam Community Development Corporation, Inc. (exhibit 7), which was incorporated in May 2006 and engaged in business development projects, including applying for grants, helping business owners access funding from government rebuilding programs, organizing loan fairs for small businesses, and securing capital for business expansion (Seidman, 2013).

The positive signs in community and economic development have not been matched by efforts to reduce the vulnerability of residents to environmental risks; responsibility for risk reduction has been handled mostly by higher levels of government charged with improving levee protection and pumping systems. Like many parts of New Orleans, the Village de L'Est neighborhood is at or below sea level on former marshland and is constantly at risk of flooding (see FEMA, 2012). Federal

Exhibit 6

Front-Yard Gardens in Village de L'Est, New Orleans, Louisiana

Source: Aron Chang

Exhibit 7

Mary Queen of Viet Nam Community Development Corporation Website

Source: Mary Queen of Viet Nam Community Development Corporation, Inc.

recovery assistance to support rebuilding efforts through the Road Home program was stalled, and citywide rebuilding standards to mitigate flood risks were delayed for years (Kamel, 2012). Because the Village de L'Est community rebuilt so quickly to meet the needs of returning residents, the rebuilt housing matched what existed before the hurricane: mostly one- and two-family homes with slab-on-grade construction. This building system is still prone to extensive damage from flooding, however. In effect, instead of altering the form of housing, neighborhood residents simply redoubled their faith in the federal and state governments' capacity to manage the infrastructure on which the neighborhood's overall viability depends. More attention to the design and structure of the buildings could have resulted in housing that offered better protection from rising waters or other environmental threats—without relying on the actions of government agencies.

Local institutions and social cohesion helped to empower the Vietnamese community and enhance their capacity and involvement in political organizing and civic affairs. As many neighborhoods struggled with rebuilding after Hurricane Katrina, the Mary Queen of Vietnam Church helped residents organize and successfully petition Entergy Corporation, the local electric utility company, to restore service in mid-October 2005, only a few weeks after the storm hit (Leong et al., 2007; Seidman, 2013). After lengthy negotiations with the federal government, the Mary Queen of Vietnam Church successfully secured an agreement to lease church land for 199 Federal Emergency Management Agency (or FEMA) trailers to provide temporary housing, but ultimately only one-fourth of the units benefited community members (Seidman, 2013). The community's rebuilding efforts were

challenged again in February 2006, when then-Mayor Ray Nagin issued an executive order to approve the operation of the Chef Menteur Landfill without a permit for the disposal of potentially hazardous debris resulting from hurricane damage. Residents were concerned that the landfill, which was less than 2 miles from Village de L'Est, did not have proper environmental protections in place and could contaminate the soil and water supply. Working with other residents, environmental groups, civil rights organizations, and politicians, the Vietnamese community pressured government officials to close the landfill. As shown in exhibit 7, they used community organizing, legal, and political tools to conduct community outreach to inform residents of environmental hazards, form a coalition called Citizens for a Strong New Orleans East, file lawsuits in state and federal court, and meet with city council members. After the community organized a protest involving several hundred people at City Hall in May 2006, a few weeks before the mayoral election, and planned an act of civil disobedience to block the entrance of the landfill in August, the mayor relented to their demands by allowing the landfill exemption to expire, and a federal judge denied the landfill operator's request to keep the landfill open (Seidman, 2013). Activists also created the Vietnamese American Young Leaders Association of New Orleans to develop the skills of young residents inorganizing their community and taking part in decisionmaking, by organizing neighborhood cleanup events, managing a youth community center, and engaging in civic activism (Seidman, 2013). Building on these successes, the Vietnamese community has sought to expand its base and partner with other community groups and organizations, in particular the significant Latino and African-American communities living in and around Village de L'Est (Leong et al., 2007; Seidman, 2013).

Faced with the destruction of their neighborhood after Hurricane Katrina, the Vietnamese residents of Village de L'Est coalesced around local institutions to help restore and rebuild their homes. The institutional structures of the Mary Queen of Vietnam Church and other organizations helped knit the community fabric together, even when different strands and members were physically separated, and also provided social support to withstand the multiple economic, political, and psychological obstacles to returning to their neighborhood. Some setbacks have occurred. A planned housing development for elderly residents was not completed, and the recovery has been distributed unequally, as many homeowners have returned to rebuild their homes but some rental apartment buildings lay vacant and damaged (Seidman, 2013). The long and difficult process of dealing with the challenges of rebuilding appeared to strengthen the organizational capacity of the Vietnamese community, which has emerged as a potent political force in New Orleans. Although the housing itself was not rebuilt to manage flood risk adequately, the fact that it was redeveloped swiftly led to strengthened social cohesion, local economic development, and political organizing in the aftermath of Hurricane Katrina. The experience of the Vietnamese residents of Village de L'Est shows that housing can afford not only the return of individuals, but also the rebuilding of a community after disaster.

Banda Aceh: Rebuilding Homes and Communities To Afford Livelihoods

The reconstruction of villages in and around the city of Banda Aceh, Indonesia, after the 2004 tsunami offers insight into how local communities outside of the U.S. context can rebuild housing

for resilient cities when disaster strikes. The landmass in Indonesia comprises more than 17,000 islands—it is the largest archipelago in the world—so it is especially vulnerable to water-based natural disasters. Its position is made even more precarious by its violently exposed presence on the western edge of the Pacific Ocean's "Ring of Fire," an area of high volcanic and seismic activity. On December 26, 2004, a massive 9.1- to 9.2-magnitude earthquake off the coast of Sumatra triggered a tsunami that destroyed much of Banda Aceh—the provincial capital and largest city in the province of Aceh. Destruction from the earthquake and tsunami resulted in the deaths of more than 200,000 people—more than 60,000 in Banda Aceh alone—and the displacement of at least 500,000 residents in Aceh. Local and international aid agencies estimated that more than 100,000 housing units needed to be replaced, including nearly 90,000 in Banda Aceh, and another nearly 100,000 units required rehabilitation (Steinberg, 2007). The reconstruction process in Banda Aceh provides an example of community engagement and housing adaptation in response to past, present, and future environmental threats.

Some observers have suggested that a second tsunami struck Banda Aceh in the form of a massive invasion of more than 300 donor agencies, humanitarian aid groups, and private foundations—some with little to no experience in housing construction and rehabilitation after a disaster (Syukrizal, Hafidz, and Sauter, 2009). Funding imperatives to spend money quickly and focus on physical reconstruction led to swift responses that relied on foreign capacity, which resulted in uncoordinated efforts that frequently disregarded the local sociocultural context (Syukrizal, Hafidz, and Sauter, 2009). The Indonesian government initially declared that permanent building construction was prohibited on land within 1.5 miles of low-lying coastal areas (Aquilino, 2011). The government's plan called for building a new city several miles from the coast, forcing thousands of families to relocate from their home communities and a major source of economic livelihood (Steinberg, 2007). Such a proposal, similar to the initial response in Sri Lanka discussed previously, revealed a narrow desire for resilient housing that ignored the close connection between housing location and place of employment. In response, Urban Poor Linkage (Uplink)—a network of nongovernmental and community-based advocacy organizations established in 2002—and other groups proposed that residents instead rebuild their homes in the areas where they previously lived (Syukrizal, Hafidz, and Sauter, 2009). Public opposition to the government's relocation proposal was so great that the government eventually shelved the plan. Uplink proceeded to create a local arm of the organization, Uplink Banda Aceh (UBA), to assist area communities with the rebuilding process.

With funding from international organizations, UBA engaged with communities in 23 villages, or gampongs, along the western of the edge of the city in a resident-driven reconstruction process.

> It began by ensuring people's basic needs were being met, then collected data on the survivors and organised people so they could start making their own decisions, planning their own communities, and reconstructing their lives (in every sense) according to their own needs and priorities. This 'reconstruction of life' approach means [UBA] does not take the physical aspects of development as a goal; instead creating housing and infrastructure is the entry-point for building people's capacity, for their participation, for trauma-healing, and for ensuring their self-determination and independence. (Syukrizal, Hafidz, and Sauter, 2009: 4)

To help build community capacity to manage reconstruction planning, in March 2005, UBA helped form Jaringan Udeep Beusaree (JUB), a grassroots organization whose name means "a network for living together" or "the village solidarity network." To help restore communities, UBA and JUB worked together and established what conditions existed before the disaster by collecting information on village demographic characteristics, family residential location, and individual employment experience. The groups organized residents and encouraged them to fill out surveys so that the reconstruction planning process would be more responsive to individual circumstances and needs (Aquilino, 2011; Syukrizal, Hafidz, and Sauter, 2009).

At a fundamental level, urban resilience depends on residents having access to basic shelter, but shelter rapidly intersects with additional priorities. "Housing reconstruction and rehabilitation is seen as central to the reconstruction of communities, which needs to be integrated with other sectors, particularly economic and social recovery" (Steinberg, 2007: 153). UBA addressed immediate postdisaster housing needs by working with villagers, who determined the shape and materials needed to build temporary shelters. The shelters were built from recovered and recycled materials, including timber and nails that residents collected from debris, and replaced the emergency tents that provided little privacy and protection from the elements. Within 5 months, residents and UBA had successfully constructed 450 temporary shelters across 23 villages (Syukrizal, Hafidz, and Sauter, 2009). The participatory process continued through the planning of permanent housing. UBA partnered with JUB to conduct a community survey and manage community-mapping projects with the goal of obtaining an accurate census of all local residents and to ensure their voices were included in reconstruction planning. By February 2007, a little more than 2 years after the tsunami, the community had constructed more than 3,000 homes and 12 community centers for resident use (Syukrizal, Hafidz, and Sauter, 2009). Exhibit 8 shows an example of a well-maintained UBA house (right) by comparison with a poorly maintained house (left).

Exhibit 8

Examples of Post-Tsunami Housing, Banda Aceh, Indonesia

Note: A well-maintained Uplink Banda Aceh house (right) as compared with another post-tsunami house (left).
Source: Miho Mazereeuw

The community-driven reconstruction process in Banda Aceh was inherently designed to support and rebuild the social structure and economic livelihoods of residents and enable them to remain in place. The trauma of the tsunami deeply affected the psychological well-being of villagers, especially because so many depended on fishing for food and trade but were reluctant to return to the water. UBA and JUB addressed the mental health needs of residents by organizing community-healing programs involving art therapy. According to one resident, "With this… we can have something positive to do and forget the trauma we experienced from the tsunami because we have something to keep us busy. We feel better now, because we can allow our anger and sadness to escape…, we can express our feelings through a different medium…. It has brought us closer together and now we are closer to women from other villages too" (Syukrizal, Hafidz, and Sauter, 2009: 9). JUB also helped establish community organizations to bring residents together at social events around the topics of art, culture, sports, and health (Syukrizal, Hafidz, and Sauter, 2009).

The earthquake and tsunami damaged the economic livelihoods of villagers, so local organizations sought to restore and rebuild income-generating opportunities around residents' skills and experience. Farming was a major source of food and income for villagers, but saltwater pouring in from the tsunami damaged large areas of farmland. To address this issue, nongovernmental organizations trained villagers to collect compost and make fertilizer from fermented fruit juices to replenish the soil for farming (Syukrizal, Hafidz, and Sauter, 2009). In addition, education programs introduced farmers to new technologies that improve planting and harvesting productivity and to crops that can successfully grow in high-salinity soil (Steinberg, 2007). Some of the new and reconstructed housing was raised on posts, which created a covered, protected space on the ground floor that could be used to support small businesses or to store fishing and farming equipment (Aquilino, 2011).

The resident-led rebuilding process also addressed the pressing concern of vulnerability to environmental risks and stress in the face of potential future natural disasters. UBA collaborated with residents to design and develop five housing models that featured seismic protections and earthquake-resistant characteristics. Houses built on stilts were designed to withstand flooding in low-lying coastal areas and to protect against land subsidence. In addition, the models included different floor plans to accommodate changing family structure and needs (exhibit 9). The development and construction of earthquake- and flood-resistant housing helped reduce the community's vulnerability to future disasters (Aquilino, 2011). Infrequent building inspections and the lack of a building permit system, however, compromised the effectiveness of the rebuilding efforts in protecting residents from potential environmental threats (Steinberg, 2007).

In parallel to the various housing reconstruction efforts following the tsunami, larger geopolitical forces also worked to enhance personal and community security. In August 2005, the government of Indonesia and the Free Aceh Movement, or GAM, reached a peace accord in Helsinki, Finland, that helped facilitate the overall reconstruction efforts in Aceh after the tsunami. Coming only 8 months after the tsunami, this peace accord enabled other community building efforts to move forward.

The emphasis on resident input and involvement served to empower communities and enhance their capacity to share in their own governance throughout the reconstruction process. JUB, the grassroots community organization, was created to help residents to organize and to lead rebuilding efforts through a bottom-up approach, in contrast with top-down government interventions.

Exhibit 9

A Collection of Rebuilt Homes, Banda Aceh, Indonesia

Source: Miho Mazereeuw

Self-determination was a key theme, as community members met each week to present problems, discuss possible solutions, and vote on options. In addition, homeowners managed the construction of their homes, with funding from humanitarian aid organizations to pay for building materials and labor, so they were closely involved and personally invested in the reconstruction process.

In Banda Aceh, nongovernmental organizations carefully engaged and worked closely with village residents to help ensure that community needs, not the agendas of outside agencies, would drive the reconstruction process. An indepth community engagement approach requires time to build trust, gain access to information, discuss needs and priorities, deliberate over options, and develop consensus. The reconstruction of villages in Banda Aceh may have proceeded faster if international aid agencies or foreign governments had imposed decisions and actions, and speed may be particularly important in postdisaster recovery situations. Quick responses that ignore local context, however, can incur other costs. Anecdotal reports suggest that recovery programs initiated by outsiders, such as cash-for-work programs that paid money to residents to clean up debris and build homes, weakened the local cultural concept of gotong royong, or communal work, so that residents expected payment and were less likely to lend help without compensation (Lamb, 2014). Taken overall, however, the case of reconstruction in Banda Aceh shows that housing can also afford community participation and empowerment.

Conclusion: Successful Struggles To Maximize What Affordable Housing Can Afford

Looking across these four examples of affordable housing as a means to pursue more resilient cities, it is clear that each case reveals both strengths and shortcomings. In San Francisco, tenants and their allies did something highly unusual in the context of the HOPE VI program: they retained

one-for-one onsite replacement of public housing in a rapidly gentrifying neighborhood. The new North Beach Place did not, however, deliver everything that residents wanted: implementing resident-driven business incubator space has proven elusive, and the very design of the housing, with its plinth and gated perimeter, represents an improvement over the free-access insecurity of the former project but also prompted new concerns about an excess of rules and surveillance that have left many residents uncomfortable. In Chile, a partnership between architects and government that produced the much-celebrated incremental housing in Iquique revived and expanded previous notions of sites-and-services approaches. It did so by upgrading an existing community in situ in ways that sought to preserve livelihood generation and to make residential life more hazard resistant. The example of Chile nonetheless raises questions about whether the incremental provision of housing (as opposed to more fully realized structures) imposes a greater burden than is absolutely necessary, giving short shrift to low-income residents simply because they are poor and fully completed housing developments are expensive.

In the context of disaster recovery, the remarkable efforts of the Vietnamese community in Village de L'Est, wherein a faith-based network built new sources of jobs and development networks, seem wholly laudable. The reconstructed housing remains substantially unchanged, however, still mostly representative of a slab-on-grade mode that remains all too vulnerable to future floods and entirely dependent on externally managed barriers that the community cannot control. Finally, the community recovery efforts led by Uplink and its partners in Banda Aceh may represent the most fully rounded realization of the four criteria proposed here for what affordable housing should afford—all the more noteworthy because it has come in the context of some of the most devastating urban trauma that the world has seen in recent decades. The process of community engagement was time consuming but, because it started very early, it helped meet the pressing needs of surviving residents who had lost family, homes, and livelihoods.

Each of these cases demonstrates in different ways that affordable housing can afford far more than shelter for low-income groups. Affordable housing can contribute to resilient cities by (1) supporting the community social structure and economic livelihoods of residents, (2) reducing the vulnerability of residents to environmental risks and stresses, (3) enhancing the personal security of residents in the face of violence or threats of displacement, and (4) empowering communities through enhanced capacities to share in their own governance.

These cases ultimately may not count as full-fledged successes (and what project can claim perfection?), but they do exemplify a kind of "successful struggle." In each case, that struggle has been rooted in the fight to stay put in spatially defined and socioeconomically constructed communities, even in situations in which those communities have been saddled with ongoing dangers and environmental hazards. In-situ approaches may not be effective—or even appropriate—for every situation, but if relocation is justified, then it must be equitable in its applicability and implementation. These cases reveal that, while the struggle may centrally revolve around the provision of housing, it extends well beyond that to address greater challenges facing poor residents. As one assessment of the work in Banda Aceh put it, "Reconstruction is about lives, not just houses, and and can be an opportunity… to deal with underlying poverty and environmental problems and to improve the lives of low-income communities" (Syukrizal, Hafidz, and Sauter, 2009: 4). The processes that residents, community leaders, and their various partners have undertaken have not

always succeeded in remedying problems or removing the sources of risk, but they have launched both discussion and action in service of those goals. Because they framed their struggles from the beginning as being about more than the affordability of housing, they were able to expand the agenda for what else housing must afford. They viewed investment—or reinvestment—in housing as intrinsically connected to the greater set of political, social, cultural, and economic reasons why their community was, on balance, much better off remaining where it had been. As a result, residents and their supporters have worked in service of a greater goal: the equitable and inclusive resilience of cities.

Acknowledgments

Authors

Lawrence J. Vale is Ford Professor of Urban Design and Planning in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology.

Shomon Shamsuddin is a postdoctoral fellow in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology.

Annemarie Gray is a recent Masters in City Planning graduate from the Department of Urban Studies and Planning at the Massachusetts Institute of Technology.

Kassie Bertumen is a Masters in City Planning student in the Department of Urban Studies and Planning at the Massachusetts Institute of Technology.

References

Airriess, Christopher A., and David L. Clawson. 1991. "Versailles: A Vietnamese Enclave in New Orleans, Louisiana," *Journal of Cultural Geography* 12 (1): 1–13.

Aquilino, Marie J. (ed.). 2011. *Beyond Shelter: Architecture and Human Dignity*. New York: Metropolis Books.

Aravena, Alejandro. 2011. "Elemental: A Do Tank." In *Latin America at the Crossroads: Architectural Design*, edited by Mariana Leguía. London, United Kingdom: John Wiley & Sons: 32–37.

———. 2008. Personal communication (interview conducted by Annemarie Gray). Executive Director, Elemental. El Comendador 1916, Providencia, Santiago, Chile.

Brakarz, Jose, Margarita Greene, and Eduardo Rojas. 2002. *Cities for All: Recent Experiences With Neighborhood Upgrading Programs*. New York: Inter-American Development Bank Publications.

Chermayeff, Serge, and Christopher Alexander. 1965. *Community and Privacy: Toward a New Architecture of Humanism*. New York: Anchor Books.

Davoudi, Simin. 2012. Resilience: A Bridging Concept or a Dead End? *Planning Theory & Practice* 13 (2): 299–333.

Federal Emergency Management Agency (FEMA). 2012. "Preliminary Digital Flood Insurance Rate Map (DFIRM) of New Orleans." http://maps.riskmap6.com/LA/Orleans.

Gilbert, Alan. 2004. "Helping the Poor Through Housing Subsidies: Lessons From Chile, Colombia, and South Africa," *Habitat International* 28 (1): 13–40.

Greater New Orleans Community Data Center (GNOCDC). 2002. "Village de L'Est Neighborhood Snapshot." http://www.gnocdc.org/orleans/10/56/snapshot.html.

Greene, Margarita. n.d. *Incremental Housing: The Chilean Experience*. Santiago, Chile: Pontificia Universidad Catolica de Chile.

Habraken, N. John. 1972. *Supports: An Alternative to Mass Housing.* London, United Kingdom: The Architectural Press; New York: Praeger.

Hamdi, Nabeel. 1995. *Housing Without Houses: Participation, Flexibility, Enablement*. London, United Kingdom: Intermediate Technology.

Jiron, Paola. 2010. "The Evolution of Informal Settlements in Chile: Improving Housing Conditions in Cities." In *Rethinking the Informal City*, edited by F. Hernandez, P. Kellett, and L.K. Allen. New York: Berghahn Books: 71–90.

Kamel, Nabil. 2012. "Social Marginalisation, Federal Assistance and Repopulation Patterns in the New Orleans Metropolitan Area Following Hurricane Katrina," *Urban Studies* 49 (14): 3211–3231.

Klein, Naomi. 2007. "Blanking the Beach: The Second Tsunami." In *The Shock Doctrine: The Rise of Disaster Capitalism*, by Naomi Klein. New York: Metropolitan Books: 385–405.

Lamb, Kate. 2014. "Banda Aceh: Where Community Spirit Has Gone but Peace Has Lasted," *The Guardian* (London), January 27.

Lang, Jon. 1994. *Urban Design: The American Experience*. New York: John Wiley & Sons.

Leong, Karen J., Christopher A. Airriess, Wei Li, Angela Chia-Chen Chen, and Verna M. Keith. 2007. "Resilient History and the Rebuilding of a Community: The Vietnamese American Community in New Orleans East," *Journal of American History* 94: 770–779.

Micco, Alejandro, Eric Parrado, Bernadita Piedrabuena, and Alessandro Rebucci. 2012. *Housing Finance in Chile: Instruments, Actors, and Policies*. IDB-WP-312. Washington, DC: Inter-American Development Bank.

Newman, Oscar. 1972. *Defensible Space: Crime Prevention Through Urban Design*. New York: Macmillan.

Organisation for Economic Co-operation and Development (OECD). 2013. *OECD Urban Policy Reviews, Chile 2013*. Paris, France: OCED Publishing.

Rojas, Eduardo. 1999. "The Long Road to Housing Reform: Lessons From the Chilean Experience." *Best Practices Series*. SOC-113. Washington, DC: Inter-American Development Bank, Sustainable Development Department.

San Francisco Housing Authority (SFHA). 1996. *HOPE VI Application: North Beach Revitalization Plan*. San Francisco: San Francisco Housing Authority.

Seidman, Karl. 2013. *Coming Home to New Orleans: Neighborhood Rebuilding After Katrina*. Oxford, United Kingdom: Oxford University Press.

Steinberg, Florian. 2007. "Housing Reconstruction and Rehabilitation in Aceh and Nias, Indonesia—Rebuilding Lives," *Habitat International* 31: 150–166.

Stewart, John. 2013. Personal communication (interview). Chairman, The John Stewart Company. Sutter Street, San Francisco.

Syukrizal, Ade, Wardah Hafidz, and Gabriela Sauter. 2009. *Reconstructing Life After the Tsunami: The Work of Uplink Banda Aceh in Indonesia*. London, United Kingdom: International Institute for Environment and Development.

Truitt, Allison. 2012. "The Viet Village Urban Farm and the Politics of Neighborhood Viability in Post-Katrina New Orleans," *City & Society* 24 (3): 321–338.

Turner, John F. C. 1977. *Housing by People: Towards Autonomy in Building Environments*. New York: Pantheon.

Vale, Lawrence J. 2013. *Purging the Poorest: Public Housing and the Design Politics of Twice-Cleared Communities*. Chicago: University of Chicago Press.

———. 2005. "Standardizing Public Housing." In *Regulating Place: Standards and the Shaping of Urban America*, edited by E. Ben-Joseph and T. Szold. New York: Routledge: 67–101.