Chapter 2
Social Capital in Post Disaster Recovery: Strong Networks and Communities Create a Resilient East Asian Community

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After any major disaster, survivors must decide if they want to return to a destroyed home in a wrecked town with no viable infrastructure and few fellow residents. In the town of Rikuzentakata, Japan where 10 % of the population was killed and 80 % of the businesses were washed away by the Tohoku tsunami in March 2011, one resident—a baker named Masayuki Kimura—has been willing to return to the destroyed area to bake sweets, breads, and snacks for his community. He returned, cognizant of the fact that turning a profit was unlikely and that his start up costs would be high. Rather than returning because of his love for business or because he had no other options, he moved back to his hometown because of his personal ties to the area. Kimura had saved his own life, and that of his mother, by evacuating to higher ground soon after the 8.9 magnitude earthquake struck off Japan's north-eastern shore at 2:46 p.m. on the 11th of March. From a hilltop nearby they watched as their home and bakery shop was destroyed; the tsunami, as high as 46 ft in some places, swallowed much of coastal Rikuzentakata.

The US$370,000 worth of business loans which Kimura had taken on before the disaster remained, though, and he considered leaving the area to start afresh elsewhere. Had he left, he would have been among many making similar choices; more than 1,200 people had left the city to move elsewhere by the end of 2011 (Barta et al. 2011). But the baking business was started by his grandfather in 1926 and he had specifically brought Kimura's father into the family to keep the enterprise going. Even while sitting in temporary housing following their evacuation, Kimura's mother soon began telling reporters that she wanted to rebuild and begin making sweets for the community again. Pushed by her words, Kimura found second hand baking gear and moved into a temporary location, discovering that many of his suppliers of equipment and foodstuffs refused to take his money when they found out where he was living. While distributing supplies at evacuation

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centers, he heard from many people discussing their nostalgia for the flavors of normal life: "People are longing for our local taste." Recognizing his personal connections to his community and the ways in which his sweets can help others rebuild their lives, Kimura has committed to rebuild whatever the costs (Wakabayashi 2011).

The story of Masayuki Kimura provides us with critical insights into the role of social capital and social networks in the process of disaster recovery. As the tsunami approached, many people survived the wave because of the actions of others; among them was Kimura's mother, who was saved by her son. For the elderly and infirm, the only hope of living through the event came from the assistance of caregivers, neighbors, and family. These connections were able to assist the bedridden into cars and vans and then out of the plain in which many homes were located. Once the waters had receded, Kimura, like other survivors, had to decide whether or not to return to his damaged home and community.

His personal ties to the town helped him to move back to the wasteland that was Rikuzentakata even though he understood the process would be costly and slow. In the process of rebuilding his business, aid from and ties to colleagues and acquaintances proved critical; financial and emotional support from network members cemented his desire to move forward. His story matches that of many other survivors and towns around the world who have displayed resilience in their recoveries. Individuals and localities bounced back from tragedy and hardship not solely through wealth, government aid, or top-down leadership, but through their neighbors, connections and social networks.

The 3/11 Tohoku compound disaster sits as one in a dizzying list of high profile disasters, including the Indian Ocean tsunami in 2004, Hurricane Katrina in 2005, and the 2010 Haiti earthquake. The last two decades of disasters have seen a clear trend of increasing casualties and higher amounts of damage (Guha-Sapir et al. 2011). Because of wide scale migration towards vulnerable coastal locations and increasing urbanization around the world, floods and water-related disasters have contributed to the increasing toll on human life. With anthropogenic global warming speeding up the rise of ocean levels and increasing the frequency of extreme weather events, disasters will continue to be part of the human condition. Under these conditions, scholars and policy makers alike should recognize the importance of providing usable knowledge about disaster recovery.

Much folk wisdom about disaster recovery remains focused on variables assumed to influence the efficiency and effectiveness of the process. Standard variables include damage from the disaster, quality of governance, the socioeconomic status of the individuals and communities affected, and the amount of aid provided by national governments and aid organizations. However, a great deal of research has shown that in a variety of important policy fields such as health, civic engagement, and livelihood searches, social networks strongly influence behavior and outcomes. One randomized experiment using five trials over 7 weeks which engaged more than 700 participants demonstrated that individuals were heavily influenced by the behavior of actors similar to them to take on new behaviors. Hence early adopters of diet diaries which recorded what foods each subject had

eaten soon passed on their behaviors to fellow network members (Centola 2011). Other research has demonstrated that if our friends and acquaintances start going to the gym, we are likely to follow suit (Christakis and Fowler 2009). Social science has known since the 1970s that "weak ties"—the people whom we meet through our friends and acquaintances—are the ones who help us find new jobs (Granovetter 1973). This chapter draws on research from a variety of scholars and disciplines to emphasize the role played by social capital and networks in disaster mitigation and recovery. It begins with a review of the standard literature on recovery, moves into a discussion of the mechanisms by which social capital influence rebuilding, and then brings evidence from a variety of studies to back up its approach. I end with a discussion of broader lessons from these studies and conclude with a focus on future research agendas and directions for scholarship.

1 Standard Literature on Disaster Recovery

Typical approaches to disaster recovery focus on the role of standard variables such as damage, governance, socioeconomic status, and aid. The concept that the level of damage from the crisis would influence the path of recovery is intuitive and was highlighted by Douglas Dacy and Howard Kunreuther's pioneering work on the process of recovery and the role of the federal government in hazard mitigation following the 1964 Alaskan earthquake. In their book they argued that "it just seems reasonable to assume that the speed of recovery following a disaster will be determined primarily by the magnitude of the physical damage" (1969, p. 72). Given the tremendous damage from Hurricane Katrina, for example, which flooded roughly 80 % of New Orleans, many observers believe that the road to recovery will be a long one. This would be in contrast to smaller scale disasters in North America, such as tornadoes, which may touch down and strike only a few homes; in such cases, it may be a matter of weeks or months before lives of residents return to normalcy.

Other scholars and journalists have argued instead that the quality of governance matters, as they envision local mayors, governors, and even national decision makers speeding up or impeding the broader recovery process. Political scientists have called the rush to judgment after disasters the "blame game" and it can be found in developing and developed nations alike. After the 1995 Kobe earthquake, many blamed the Japanese national government for not bringing in the Self Defense Forces quickly enough to assist with fire fighting, search, and rescue. After Hurricane Katrina in the summer of 2005 many openly blamed Mayor Ray Nagin, Governor Kathleen Blanco, and President George Bush for failing to put sufficient disaster preparation and mitigation in place despite the widespread knowledge of the weakness of New Orleans' levee system. Similarly, after the Tohoku disaster in March 2011, observers were quick to argue that ties between Tokyo Electric Power Company (TEPCO) executives and the long ruling Liberal Democratic Party (LDP) in Japan resulted in less than sufficient safety standards at nuclear power plants

(with one critic tweeting "amakudari kills" in reference to the practice of regulators descending from heaven into paid positions in the industries they have regulated while in government).

Sociologists and economists have focused on the socioeconomic status of victims and have tried to link their recovery processes to their wealth and private resources. In studies of recovery from the early twentieth century earthquake and fires in San Francisco, California, for example, researchers argued that lower class individuals had to move multiple times in their search for post-quake shelter. Such actions made it more difficult for them to effectively restart their lives. Other studies have underscored that many of the victims of Hurricane Katrina in New Orleans were individuals with low incomes and little education, and that their livelihoods suffered more than survivors of higher status. Many of the communities struck hardest by the 2011 Tohoku earthquake and tsunami were older, retired residents with little savings and no home or earthquake insurance. Government officials in Japan worry whether these residents will be able to carry out effective recoveries given their limited reserves of financial capital.

Finally, many researchers and policy makers have argued that the amount of aid provided from outside institutions, whether national governments, NGOs, or international organizations such as the United Nations or the United States Agency for International Development (USAID). After the eruption of Mount St. Helens in the state of Washington, the governor was asked what she needed. In her response, she spelled out the word "money." International observers have worried when autocratic regimes have refused to accept international aid offers, such as the government of Myanmar following its typhoon. Their core concern has been that a lack of aid for survivors will result in slower recovery overall.

2 A New Approach: Social Capital

Traditional approaches have focused primarily on factors external to disaster-affected communities, and have paid little attention to the ways in which social relationships within the community may drive or inhibit the process of rebuilding. New research on the role of social capital—the ties that bind us together and provide useless data and information on trustworthiness—has illuminated three mechanisms through which networks and relationships can influence the process of disaster recovery.

The first—illustrated well by the vignette about the baker in the town of Rikuzentaka—is known by economists as the choice between "exit" and "voice" (Hirschman 1970). Exit refers to the process of uprooting from one's initial community and starting life over again in a new one. Survivors of disaster may exercise exit early on—when they realize that their homes are damaged or destroyed—or later in the recovery process, when they see that their community is not recovering effectively. Following the Diaspora from New Orleans after Hurricane Katrina, many survivors decided to start their lives over again in

communities in Houston, Dallas, Memphis, and so on. They did so because they believed that their new communities provided better livelihoods, or because they feared that their own recoveries in New Orleans might be stalled. Alternatively, survivors may choose to return to wrecked houses and rebuild their lives no matter how much damage has been done to them. When residents return and begin to work collectively, letting authorities in the area know their preferences and working to make themselves heard in the planning process, economists call this "voice." Research on the process of return has underscored that individuals with more ties to their old communities—whether through family, friends, a sense of belonging or place, or jobs—are more likely to return and exercise voice. Those who feel less connected to their neighbors, or who feel that their networks are not returning, will be more likely to select exit.

The second mechanism by which social capital can assist following disaster is with the overcoming of barriers to collective action. Around the world, people often have strong beliefs and deeply rooted ideals, but they may not actually work to see these put into practice. This may be because they lack the time, energy, or ability, but it can also because they assume that someone else will do the "heavy lifting" involved. Social scientists call this phenomenon free-riding, and because of it many are content to remain in their homes or offices while others go out and march, vote, sign petitions, blockade doors, and actually mobilize. Post-disaster situations often have collective action problems that require maximum participation. To deter looting, for example, everyone in the neighborhood has to chip in and give up us some of their sleep or free time to walk on patrol. If people opt out or decide to shirk their responsibilities, they may open up the area to potential thieves. To ensure that authorities will turn power back on to damaged areas, everyone has to ensure that they sign up through online or paper forms indicating their return.

Some communities, such as Village de L'est in northeastern New Orleans overcame their collective action problems (they convinced the local utility to restart their power) while other areas, such as the condominium owners in Kobe did not (they were unable to fully take advantage of an offer from the city government to remove debris if all owners signed onto the plan) (Aldrich 2012a). Areas with higher levels of trust and social capital can better overcome the barriers to collective action and mobilize their residents to participate; communities where people lack trust and believe that others will not come to their aid will find themselves mobilizing only a small fraction of the returnees.

The final mechanism by which social capital assists post-disaster is through the provision of mutual aid and informal insurance. An example may help illustrate the ways in which social capital provides information, fellowship, and support during times of crisis. After the Tohoku tsunami struck the town of Shichigahama (literally "Seven beaches") in Miyagi Prefecture and destroyed roughly 1,000 homes there, a knitting club named *Keito Iki-Iki* (Yarn Alive) has emerged to provide social support for its 20 or so mostly elderly neighbors. "It cheers me up so much that I don't even feel lonely at night, I just feel like knitting some more," reported one member whose home and store were washed away by the tsunami. Later, when the same resident missed a club meeting to attend an athletic event, her fellow knitters

called to check up on her (Ono 2012). Informal insurance means that network members provide necessary resources at a time when standard suppliers of those resources—such as the government, private sector companies, and so forth—are unable to do so. Similarly, after Hurricane Katrina suppliers such as Wal-Mart, gas stations, and hotels were closed, so neighbors borrowed power tools, gasoline, and places to stay in order to work on their damaged homes.

3 Review of Literature on Social Capital

Research on social capital's role in post-disaster recovery has been building up gradually into a strong component of the broader field of disaster research. One of the earliest works on this topic came from sociologists who recognized that people in need of resources go to formal service providers, such as government welfare agencies, only as a last resort. Instead, many people prefer to use their friends, family, and network connections for support during crises. Using data on survivors of Hurricane Andrew in 1992, one team of scholars established the importance of network ties in the recovery process. At a time when normal sources of support were closed due to the damage wrought by the hurricane, survivors sought support from network members through formal and informal channels (Beggs et al. 1996).

Through a separate investigation of how three rural communities in Manitoba, Canada handled the 1997 Red River Flood, researchers soon confirmed the role of stronger social capital in the recovery process (Buckland and Rahman 1999). In their focus on how the communities prepared for and then handled the disaster, they found that the social ties among residents profoundly influenced the trajectory of disaster response. In the communities of Roseau River, Rosenort, and St Jean Baptiste, Rosenort had the highest levels of civic engagement as measured through both the number of organizations and the number of meetings. "Rosenort in particular demonstrated a vigorous response to the flood, which was made possible through intense social capital formation, reflecting the community's unique historic, cultural and religious background" (Buckland and Rahman 1999, p. 188).

Data from the Gujarat and Kobe earthquakes in India and Japan, respectively, further demonstrated the importance of bonding, bridging, and linking social capital in furthering recovery and rehabilitation efforts (Nakagawa and Shaw 2004). This comparative study used both qualitative and quantitative methods to better understand the factors responsible for speedier and more efficient recoveries. While the two areas struck by earthquakes had very different cultures and levels of socioeconomic development, "At every stage of the disaster cycle (rescue, relief and rehabilitation), the communities played the most important roles among other concerned stakeholders" (Nakagawa and Shaw 2004, p. 27). Further, individuals in more civically active and engaged communities expressed higher levels of satisfaction with the process of planning and recovery than survivors from more fragmented and less involved areas.

A number of recent studies have underscored the role of social networks in broader processes of adaptation and resilience. One highly-cited study in *Science* magazine argued that local institutions and social networks provided the basis for both local and international action in response to increasing vulnerability. The article brought examples from the 2004 Indian Ocean tsunami and the 2004 Hurricane Ivan to show how well-connected communities learned from previous hazards and used social connections to strengthen their resilience. The authors emphasized that "Networks and institutions that promote resilience to present-day hazards also buffer against future risks, such as those associated with climate change" (Adger et al. 2005).

One researcher set up in-depth, process-tracing case studies of how two communities in Nagata ward of Kobe, Japan handled the 1995 earthquake which devastated the city's urban center and killed more than 6,400 people (Yasui 2007). "Both communities were characterized by population decline, aging population, fragile old wooden housing, high building density, narrow streets and mixed residential and industrial land uses located near to each other" (Yasui 2007, p. 15). Despite these similarities, Mano has been known since the early post-War II days as a well-organized community with high levels of civic engagement and participation. Beginning with greening and anti-pollution movements, the community has been a locus for activism and involvement with strong, interconnected networks. It further demonstrated its ability to overcome collective action problems when handling the fires that broke out after the 1995 earthquake. As one local leader recalled, "when fire erupted after the earthquake, people started lining up and handing buckets full of water to the next person to put out the fire because the water pressure was too low to use the fire hydrant properly" (Yasui 2007, p. 186).

In contrast, Mikura has little history of past activism, and residents were hard pressed to remember community development activities in the past. When fires broke out following the quake, "the residents of Mikura community passively watched as their homes burnt to ashes" (Yasui 2007, p. 227). While Mikura developed its capacity post-disaster, many of its residents did not return, and much of the work done in the area was carried out through outsiders.

Another study of the 1995 Kobe earthquake recovery process looked less at communities and neighborhoods and more at the recoveries of individual survivors (Tatsuki 2007). Through four waves of surveys with roughly 1,000 respondents, the Hyogo Life Recovery Survey Project designed a life recovery scale based on 14 different factors. The author then categorized responses into fields of self governance and solidarity, and found that there were statistically significant differences in the same respondents before and after the quake.[1] Many survivors moved from more self-focused approaches to communitarian approaches, shifting their field of focus from themselves and their families onto the broader neighborhood and society. Individuals who reported higher levels of solidarity and civic-mindedness

[1] Supporting these findings, Cassar et al. (2012) provide experimental evidence that victims of disaster are more trusting of others and simultaneously moderately more trustworthy.

tended to have stronger recoveries than more isolated individuals. Through focus groups and interviews Tatsuki showed how social ties helped survivors to rebuild communities and then to retell the story of the disaster as one of recovery and engagement as opposed to one based solely on loss.

After the 2005 Hurricane Katrina which resulted in the collapse of the levees in New Orleans, Louisiana, a scholar showed how local community ties and the accompanying narratives of recovery strongly predicted levels of community recovery (Chamlee-Wright 2010). Chamlee-Wright saw post-disaster situations as ones in which many people have strong disincentives from expending time and energy on recovery, preferring to free ride on the efforts of others. Given that communities provide the associational worlds which govern norms and behavior, she "recognizes a reciprocal relationship between the institutional rules of the game and cultural processes" (Chamlee-Wright 2010, p. 16). Using this focus on social capital and community ties as a start, she used interviews and case studies to document the different levels of recovery across four neighborhoods in the city: Lower Ninth Ward, Mary Queen of Vietnam, Broadmoor, and St. Bernard Parish. Her approach showed how important the cultural tool kits and levels of solidarity are in the process of recovering after crisis.

Similarly, scholars researched the ways in which different types of social capital created different capacities in two neighborhoods devastated by Hurricane Katrina (Elliott et al. 2010). One neighborhood, the Lower Ninth Ward, was made up primarily of African-Americans who lived below the poverty line, while the other, Lakeview, was a neighborhood made up primarily of affluent whites. Interviewing 100 residents from each of the neighborhoods, the authors sought to understand how networks—especially bonding and linking social capital—played a role in recovery after the storm. Overall, it took more than twice as long for residents of the Lower Ninth Ward to return to their homes as their counterparts in Lakeview, and they also were about one-seventh as likely to contact a neighbor. In the Lower Ninth Ward, individuals were less likely to connect to their geographically proximal neighbors and friends and also less likely to be able to call on the help of outsiders who lived beyond the ruined area. "As a result, relative declines in translocal assistance dovetailed with a relative inability to re-establish local residential networks to undercut the reconstitution of local sources of social support for Lower Ninth Ward residents" (Elliott et al. 2010, p. 643).[2]

One final book drives home the power of social networks in rebuilding after crisis and hints at the potential for positive interaction between social networks and the state. Rieko Kage used the wide variation in reconstruction rates among Japan's 47 prefectures after World War II to reject explanations for post-crisis recovery based on economic or state-centric hypotheses which posit that higher levels of economic resources or the presence of a cohesive and autonomous state are sufficient conditions for better recovery (Kage 2011, p. 143). Through side-by-side

[2] The researchers are referring to the ability of individuals living outside the affected area—hence the term "translocal"—to provide resources at a critical moment.

process tracing of YMCAs in Kobe and Sapporo along with cases of judo clubs in Fukuoka and Yokohama, Kage showed how some areas in pre-war Japan had greater citizen enthusiasm for and involvement in voluntary activities while others withered, especially as war time conditions deteriorated and top-down, government coercion intensified.

4 Additional Evidence of Social Capital's Role

To further illustrate the role of social capital in post-disaster recovery, three "megacatastrophes" over the past century show how networks strongly influenced the trajectories of rehabilitation across time and space. The three disasters under review are the 1923 Tokyo earthquake, the 2004 Indian Ocean tsunami, and the 2005 Hurricane Katrina All resulted in the deaths of more than 1,000 people and caused tremendous amounts of property damage.

On 1 September 1923 at approximately noon a tremendous earthquake struck the capital of Japan, collapsing buildings and setting off fires which raged for several days. When the smoke cleared, the earthquake had caused more than 140,000 deaths and leveled roughly 40 % of Tokyo. Roughly two-thirds of the population became homeless and more than 345,000 homes were lost to fire and shaking. Residents began seeking to rebuild within days, constructing "barrack" type temporary housing units using debris and scrap metal in whatever land they could claim. Images from the town show popular parks filled with ramshackle cabin-like structures, often with carts filled with materials parked just outside.[3] However, even though the drive to rebuild was strong, some neighborhoods seemed to display more resilience than others, drawing back in old residents and attracting new immigrants, while other communities seemed to lose population. To better understand why some areas revitalized at the same time that similar communities became ghost towns, I used detailed police records from the 1920s and the 1930s to understand the conditions of recovery (Aldrich 2012b).

The Tokyo Metropolitan police operated out of neighborhood police boxes called *kōban*, and their records of daily life in their communities were extensive and well maintained. From their surveys, I extracted neighborhood level measures of population density (measured as individuals per kilometer), the number of factory workers per capita (who, on the whole, were uneducated migrants from the countryside) along with the number of commercial cars per capita in the neighborhood. I also collected information on the number of trucks and cars, the per capita cost of crime in the area, and the percentage of local residents killed in the earthquake. To understand the financial resources available to local residents, I included observations of per capita pawnbroker lending rates; pawnshops were seen

[3] The Reynolds collection (http://library.brown.edu/cds/kanto/about.html) has over 100 photographs taken in Japan immediately following the earthquake.

as such important sources of credit that the Tokyo municipal government itself sought to rebuild pawnshops to replace those that had been destroyed in the earthquake. To measure the ability of local residents to overcome collective action problems and to work cooperatively, I recorded the number of demonstrations per year (in each neighborhood) along with voter turnout in municipal elections (for which universal male suffrage had just been granted).

To check to see which of these potential factors—economic capital, population density, damage from the earthquake, and so on—had the strongest impact on the process of population recovery, I ran three different types of analyses. I first used a simple bivariate analysis, dividing the neighborhoods into those with high levels of social capital (above average levels of voter turnout and demonstrations) and those with lower levels of social capital (average or below average levels of these activities), and looked at their average population growth rates. The chi-squared value for a tab test of below-average/above-average social capital with below-average/above-average growth rates was 0.001, indicating a statistically significant difference between these two types of communities. Then, I used a method called propensity score matching to try to build a dataset which mirrors the "twin studies" often carried out by medical scientists looking to establish a causal relationship.

This approach creates a dataset of observations which are quite similar, in which all of the observations had a similar propensity to receive the treatment (in this case, high or low levels of social capital) but only some did. In doing so we can better create causal inference about our variables of interest. Using this method, I found that neighborhoods with higher-than-average numbers of political demonstrations had a 2 % higher level of population return than very similar neighborhoods (in terms of earthquake damage, economic and human capital, area, and so forth), with lower-than-average numbers of rallies, marches, and protests.

My final analysis of the data from Tokyo used time-series, cross-sectional, panel-corrected models to hold all of the control variables (damage from the earthquake, pawn broker lending, population density, and so on) at their means while allowing voter turnout to vary. Using the simulation program known as "Clarify" I generated predictions for the population growth rate along with 95 % confidence intervals around this prediction. The result showed a very strong, positive relationship between voter turnout and population growth, holding constant the values of the other factors. Communities in which the people turned out to vote had a far higher population growth rate than areas in which people voted in smaller proportion. Even a century ago, the impact of social capital on post disaster recovery is measurable and statistically significant. Some 100 years later, though, social capital proved equally important.

A great deal of work on the 2004 Indian Ocean tsunami has shown the power of social networks in the process of recovery. On the 26 December 2004 a "megathrust" earthquake of at least a 9.0 magnitude struck off the west coast of Sumatra, Indonesia and set off tsunami as tall as 100 ft in some areas. The tsunami devastated coastlines in India, Sri Lanka, and Indonesia, killing close to 200,000 people across these areas, with 35,000 killed in Sri Lanka. Seventy thousand (70,000) houses in Sri Lanka were destroyed completely with another 30,000

damaged. Many of the villages struck by the tsunami were coastal fishing villages with homes and livelihood locations directly next to the ocean. Recovery across villages has varied; some have recovered population and put their fisher people back to work, while others languished for months, if not years.

Minamoto (2010) carried out surveys of 187 households in eastern Sri Lanka located in areas which had suffered damage from the tsunami. To measure levels of social capital, the author looked at "(1) the social norms, people's behaviors and attitudes during reconstruction; (2) changes in networks during reconstruction; and (3) characteristics of the community-based organizations to which our respondents belonged" (Minamoto 2010, p. 551). The results of the quantitative analysis showed that linking social capital—that is, connections between survivors and national and international nongovernmental organizations (NGOs) proved critical at helping to secure necessities such as food, shelter, water, and education. Trust among the members of community-based organizations along with formal community networks had strong, positive relationships with livelihood recovery, while more bonding social capital—focused on the family and kin—occasionally contributed to negative perceptions of recovery.

The recognition of the role of social capital in Sri Lankan recovery pushed international aid organizations, such as UN HABITAT to help affected communities to rebuild not only their homes but their social networks as well (see details on the intervention at http://www.fukuoka.unhabitat.org/projects/sri_lanka/detail10_en.html). In their study of five affected districts in Sri Lanka, DeSilva and Yamao (2007) argued that "poor social capital status makes communities more vulnerable and highly dependent on donors" (DeSilva and Yamao 2007, p. 45) while "high levels of social capital facilitate the entrepreneurial ventures among farmers" (DeSilva and Yamao 2007, p. 46). The higher levels of trust and coordination among well integrated communities provided them with opportunities for risk-taking and entrepreneurial ventures which could, over the long term, secure their livelihoods and increase their income. In contrast, communities with lower levels of trust who were unable to coordinate their activities found themselves most dependent on the generosity and activities of the international aid community.

Another example came 1 year after the Boxing Day Tsunami—in late August, less than a year later, Hurricane Katrina arrived on the Gulf Coast of North America. The collapse of the levees after the landfall of Hurricane Katrina on 29 August 2005 submerged some 80 % of New Orleans; it was almost 2 months before the water was pumped out of some neighborhoods. While many neighborhoods in the city remain under populated and filled with debris and weeds, others quickly rebounded from the flooding and began renovating their homes and businesses. Observers suggested a number of potential explanations for the variation in recovery speeds. Some argued that economic resources held by survivors best predicted who would return and begin rebuilding, and who would stay away. Others argued that race—long a divisive issue in the city—would influence the recovery process. But one scholar has focused on the ways in which communities create their own narratives and norms of independence, hard work, and collective responsibility.

Emily Chamlee-Wright's book on the recovery process focused on the cultural toolkits held by residents of neighborhoods across the city. One area has stood out as a paradigm of independence, solidarity, and rapid rebuilding: the primarily Vietnamese and Vietnamese-American community centered around Mary Queen of Viet Nam (MQVN) church. "By spring 2007 over 90 % of the Vietnamese American residents but fewer than 50 % of the African Americans had returned to Village de L'Est" (Leong et al. 2007). Located in the northeastern, Village de L'Est area of the city, the community returned within months of the flooding and demonstrated its ability to influence broader public policy when it successfully shut down the Chef Menteur Landfill which had been reopened to accept storm debris. MQVN's residents comprise both older residents who came over from Vietnam at the height of its war in the mid 1970s along with a younger generation which has grown up with the norms and teachings of the community.

Interviews with local residents underscored their norms of collective responsibility and a belief in the value of hard work. One resident, when asked about concerns that the city was not up and running when they returned, argued that "it didn't really matter that we didn't have [municipal] services up" (quoted in Chamlee-Wright 2010, p. 69). Rather than waiting for the city to provide social services, or local businesses to restart and sell necessary materials for rebuilding, the community self-organized before returning, dividing up responsibilities and ensuring that they would be self sufficient upon their return. Further, because of their historical experiences and insular culture, the community saw the widespread damage from the storm as a relatively minor nuisance compared with their previous struggles during the Vietnam war. As one interviewee pointed out, "thirty years ago [we came] with empty hands. . .thirty years later we already have the tools for everything, strategies, [and] the understanding [that] we can rebuild that" (quoted in Chamlee-Wright 2010, p. 70)

The bonding, bridging, and linking social capital in the area allowed residents to not only coordinate their rebuilding processes internally but to ensure that their voices were heard by the city government and other relevant institutions. "In Village de L'Est, under the leadership of the Mary Queen of Vietnam Church and its new Community Development Corporation, residents have rebuilt most of the community's single-family homes; an unsafe landfill has been shut down; new senior housing and urban farms are under development; businesses have returned to the two main commercial districts; and a new health center and charter school are being planned" (Brand and Seidman n.d.). Few other neighborhoods in the city of New Orleans have been able to replicate the success demonstrated by MQVN after Katrina.

5 Discussion

In this chapter I have tried to underscore the ways in which social capital serves as a critical part of disaster recovery by bringing evidence from a variety of disasters and catastrophes in different nations and time periods. I believe that the growing body of evidence on social capital suggests three broader lessons. First, it hints at the importance of thoughtful and sustained interaction between government and local social networks. Next, some standard recovery strategies may in fact harm the social infrastructure so critical for the processes of rebuilding and hence should be planned carefully. Planners should be careful to think through and avoid these potential barriers to effective recovery. Finally, should these studies indeed capture the essence of social capital's role, the findings suggest next steps for both governments and NGOs which seek to improve the recovery process after crisis.

This chapter has shown how social capital—the ties that bind neighbors, friends, and acquaintances together, deepening their trust and making their collective action more likely—works in ways often guided by geography and distance. As local-level networks and community based organizations can coordinate group actions and deepen trust, governments should recognize their role in broader emergency management and disaster recovery planning. Kage (2011) showed how local civil society organizations interacted with government resources to further the process of recovery after World War II in Japan. National and regional governments have deep resources but can easily direct them to useless or damaging projects.

Through strong coordination with local social networks and community groups, valuable resources from the state can be used more effectively and efficiently. For example, while national planners may envision a bridge or road as critical, local residents may understand that restarting a school or local church will form a critical "anchor" in the recovery process. Governments able to tap into the local knowledge and mobilization potential of well-connected neighborhoods could use social capital as a "force multiplier" and extend the scope of their programs. Future quantitative and qualitative research should look closely at the ways that local social networks interact with government mitigation and recovery policies.

In a related way, standard recovery plans may actually harm reservoirs of social capital. For example, after large-scale disasters government agencies usually seek to rush survivors out of temporary emergency dwellings into long term shelters. This strategy, carried out in good faith, can easily harm existing networks by placing vulnerable individuals, such as the elderly and infirm, in areas far from their friends, family, and networks. Following the 1995 Kobe earthquake, for example, many older survivors were rushed into long term housing, but the tragedy that followed was unexpected: more than 240 survivors died "lonely deaths" in their new apartments. Without friends, family, and networks, these survivors had little to live for. New recovery plans should build instead on bottom up strategies which integrate a deep knowledge of the needs of the community with its own voice.

One example of a program to activate and sustain local community involvement in recovery efforts comes from the Tohoku disaster. The Hobo Nikkan Itoi Shimbun

has documented the stories of a number of local residents whose homes and livelihoods were disrupted by the tsunami (http://www.1101.com/yamamotocho/english/2011-10-20.html). In telling the story of their activities - cleaning up debris, sorting out the relief supplies and sharing them among themselves—at the early stage in their life as evacuees, these narratives underscore the power of the group in both accomplishing measurable outcomes (e.g. making a mud-filled home livable again) and in creating a new identity. Through their group activities in the community, residents move from victims to active agents with dignity.

Finally, should these studies capture the reality of recovery, the next stage of work should be pursuit of research on increasing levels of social capital in vulnerable areas through public policy. Several studies have shown that tactics such as community focus groups (Brune and Bossert 2009; Pronyk et al. 2008) and community currency or "scrip" (Doteuchi 2002; Richey 2007) can deepen trust among participants and increase their civic engagement. Governments around the world should consider investing fewer funds in often misused or underutilized physical infrastructure and consider the ways that deepening their social infrastructure can improve recovery outcomes. Social capital-focused programs may not only be cheaper than interventions focused on physical infrastructure, but their impact will be felt for a longer period of time as well.

6 Conclusion

This chapter has suggested a new paradigm for thinking about disaster recovery and for designing emergency management responses. Moving beyond "brick and mortar" approaches to recovery, it has stressed that the ties between residents may serve as a critical engine during what may be a long and difficult recovery process. Ongoing research in related fields continues to support this approach. Coppock et al. (2011), for example, demonstrated that the establishment of collective action groups in rural Ethiopia, along with the creation of social safety nets, had led to measurable improvements in quality of life and to reduction in hunger. Working with more than 2,300 women in 59 collective-action groups on the Borana Plateau, researchers demonstrated that low cost (US$1 per month per person over 3 years), peer networking and participatory education programs improved lives and strengthened human development. These sorts of new public policies suggest a new wave of government and NGO action which move beyond the traditional sorts of interventions that have been the norm since the 1950s.

East Asia has suffered from a number of disasters over the past decades, and as nations like China, India, Indonesia, and Vietnam modernize and urbanize, their populations will be increasingly vulnerable to natural and man-made crises. Rather than merely responding to disasters as they occur in the future, visionary decision makers in these and other countries should move to embrace a social-capital based approach to policy making. Bringing residents to the forefront and increasing community based planning will ensure a strong future for these important countries.

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