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Daniel P. Aldrich

Purdue University

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The East Asia Institute
909 Sampoong B/D, Euljiro 158
Jung-gu, Seoul 100-786
Republic of Korea
Tel. 82 2 2277 1683
Fax 82 2 2277 1684



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Abstract

Disasters of all types remain among the most likely hazards residents around the world will encounter. The costs of disasters in terms of suffering and economic outcomes in developing and developed nations continue to rise. Much policy focus continues on measures to increase physical infrastructure preparedness and repair. In contrast, little research has sought to illuminate the ways that societal and state characteristics — such as government capacity and levels of societal trust — interact in post-disaster environments. Using four qualitative case studies, this paper underscores that the role played by government and civil society in crisis situations and the need to better understand the interaction between norms, trust, and political institutions. The results bring important policy ramifications for decision makers, international development assistance, and citizens alike.

Introduction

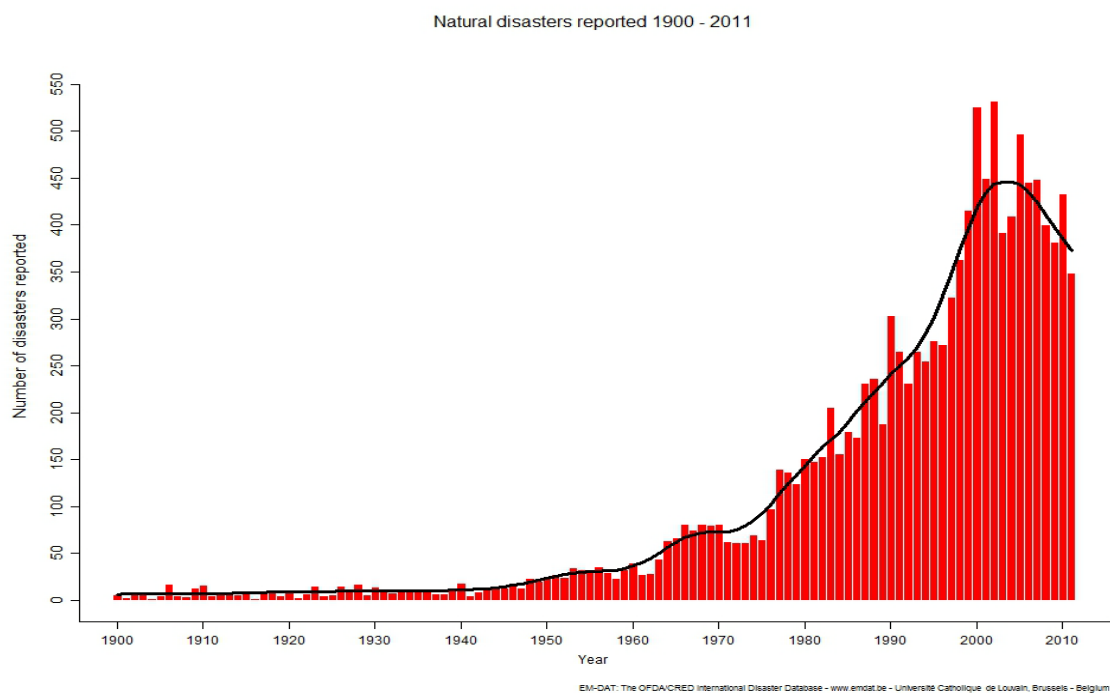
RECENT DISASTERS — SUCH AS THE 3/11 COMPOUNDED DISASTER IN TOHOKU, JAPAN, THE 2011 EARTHQUAKE IN Christchurch New Zealand, and the 2013 earthquake in Sichuan China — continue to drive home the widespread problem of vulnerability to disaster. Regardless of levels of industrialization and development, nations face severe challenges in preparing for and responding to disasters such as earthquakes, tsunamis, typhoons, mudslides, and other catastrophes. As we move further into the 21st century, crises triggered by complex technological systems interacting with nature — such as nuclear power plants which have lost multiple cooling systems due to external shocks — will further challenge the capabilities of elected leaders. As seen in the BP oil spill in the Deepwater Hori-



zon drilling rig off the Gulf Coast of the United States and the hydrogen explosions, fuel meltdowns, and leakage of radioactive materials at Fukushima Dai-ichi reactors in Ōkuma and Futaba, Japan, the “wicked problems” of disaster mitigation and management continue to expand. These challenges serve as wicked problems because of their unstructured, cross-cutting, and relentless nature; that is, they involve complex ripple effects, have multiple stakeholders, and cannot be solved “once and for all” (see Weber and Khademian 2008 and Head 2008 for an overview of this type of policy challenge).

Figure 1 (below) details the increasing number of natural disasters over the 20th and early 21st centuries. Note specifically how the number of disasters recorded for roughly the first half of the 20th century remained flat, at fewer than 30 per year. However, with the global trends of development gains, population increase, and urbanization during the post-World War II period, the number of yearly disasters skyrocketed to reach more than 370 per year by the early 21st century. While the number of deaths per disaster has actually been decreasing, the property damage, opportunity costs, and economic consequences of this increase have taken their toll on nations around the world. Scholars have argued that in 2011, the total costs of natural disasters around the world reached more than 380 billion US dollars (Mysiak et al 2012), and these financial costs are separate from the 60,000 or so lives lost each year primarily in developing nations to collapsed buildings following earthquakes (Kenny 2012). Scholars have also estimated that large scale disasters, such as the 1995 Kobe earthquake in the Kansai region of Japan, lowered household incomes by 15 percent for periods as long as 15 years after the event (DuPont and Noy 2012).

Figure 1. Increasing number of natural disasters over the past century



■ Note: Data from EM-DAT



Much policy work at the national and international level remains fixated on physical infrastructure and physical preparedness for disaster. Guidelines for vulnerable residents stress individual preparation of food and water and short-term responses such as sandbagging vulnerable properties. Engineering standards for homes and high rises continue to tighten and planners in many advanced democracies have sought to move populations away from vulnerable communities. For example, the densely-populated urban center of Wellington — the capital of New Zealand — sits atop multiple active faults, and as a result, decision makers in the 1970s decided to significantly tighten building codes. As many of the buildings in the city had been completed in the late 19th and early 20th centuries, preparing the overall urban area for future quakes meant tearing down older buildings and reinforcing the remaining ones through building techniques such as lead dampers and rubber bearings (Site visit to Wellington NZ April 2013). Kiwi engineers continue to check some 4000 public and commercial buildings in the city and have issued hundreds of “section 124” notices which require owners to reinforce or demolish earthquake-prone buildings within a set period of time (see <http://quake.howison.co.nz/> for details). Another example of the physical-infrastructure focused work on disaster mitigation comes from policy responses to the 2010 and 2011 Christchurch earthquakes which began in September 2010 and continued through the 22 February 2011 quake which killed 185 people. The collapse of multistory office buildings in Christchurch caused the largest number of fatalities and the central government worked through new organizations such as the Canterbury Earthquake Recovery Authority (CERA) to “red zone” the downtown area. In doing so, CERA has sealed the area from occupancy until unstable commercial and residential buildings can be demolished and new ones completed.

Many disasters have triggered similar built-environment policy foci from decision makers around the world. After the 26 December 2004 Indian Ocean tsunami which killed almost a quarter-million people across Southeast Asia, the Government of India ordered all coastal residents to move 5 km back from the water. For many fishermen, this distance prevented them from effectively carrying out their livelihoods on the ocean and they ignored the order, choosing to remain in their vulnerable homes. Similarly, in Tohoku, Japan, the central government continues to fund dual-type responses to the 3/11 compounded disaster. Because many communities are divided about potential relocation plans involving cutting down local mountains and moving existing houses to newly created higher ground, Tokyo has funded both the creation of new sea walls and the relocation of homes.

With a focus on physical damage and physical responses, many policy makers emphasize the need to be able to provide financial aid and aid-in-kind to disaster affected communities. On a global scale, decision makers continue to plan for joint international responses involving disaster assistance and humanitarian response; planners have proposed establishing a disaster relief hub in northeast Asia involving the U.S.-Japan alliance. This formalized institution would allow rapid response to crises in Southeast Asia and elsewhere and further cement relationships between the two nations which have formed the bedrock of the US presence in the area since the end of the second World War (Ahn, Bradford, Newberry, and Wescott 2012). The intuitive beliefs that physical damage from disasters affects recovery speed and that aid from NGO and state institutions



will speed up post disaster-discovery are pervasive. In their seminal piece, Dacy and Kunreuther argued that “[i]t 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: 72).

In responding to disasters and in mitigating future crises, decision makers seek to increase the robustness of physical infrastructure and to restore lost buildings, ports, roads, and bridges. This standard operating procedure response to disasters can be seen both at the domestic and international levels. The North American institution known as FEMA (Federal Emergency Management Agency) and the international development agency known as USAID (United States Agency for International Development) regularly respond to disasters by treating the wounded, burying the dead, providing supplies of food and water, creating temporary shelters, and then departing the affected area. When catastrophes strike domestically or abroad, these organizations move to repair the damaged physical infrastructure and provide aid to survivors.

The consequences of and response to disaster, however, may be more than a function of the intensity of the event and the funds and aids made available to survivors and national governments. One recent example underscores that the same disaster can have radically different impact on societies with different levels of government capacity and citizen involvement. On 26 August 2008, Hurricanes Gustav barreled down on the Caribbean and became the second most destructive hurricane of that year, causing more than \$6 billion (US) in damage to the area. When the storm subsided, its effects on the nations in the Caribbean were quite different. The same wind and rain combination had killed 8 only in the Dominican Republic (primarily from a mudslide which killed an entire extended family) but 77 in Haiti. Further, the nearby nation of Cuba — which evacuated more than 100,000 people in the path of the storm — suffered no fatalities whatsoever despite the increase of wind speeds to 125 mph as the hurricane passed over the island. Given that the same storm system pounded all three nations, the variation in the number of casualties is striking. Certainly the “strength” of the disaster by itself cannot explain these outcomes in terms of deaths, and post-disaster aid cannot explain the patterns of recovery and development.

Understanding how the same storm system could create different levels of fatalities in three neighbor nations is a critical challenge for scholars and policy makers alike. Similarly, large scale disasters in different nations have generated very different reactions. In some cases, as in Japan following the 3/11 compounded disaster, despite the potential dangers from radioactive contamination and nearly 17,000 casualties from the tsunami, no looting, increased crime, or other socially damaging behaviors were reported. The Japanese government did its best to engage Self Defense Force troops, medical teams, and disaster managements to respond to the event. This was a sharp contrast with the delayed response from the central government of Haiti and the looting, food riots, and public mob justice meted out following the January 2010 earthquake there. The differences both in during-disaster outcomes such as fatality levels but also in post-crisis social coordination and mobilization speak to the importance of additional factors in responding to disasters beyond the strength of the disaster and the robustness of physical infrastructure. This article explores the outcomes of resilience and recovery with a focus on the interaction between state capacity and input structures. Through four case studies of nations with different combinations of



democratic governance and state capacity it illustrates how these national level characteristics influence disaster outcomes and responses. After providing brief details of each disaster, the article then concludes with broader lessons from the investigation along with relevant directions for future policy work.

State-Society Interaction: Input Structures and Government Capacity

As scholarship on governance has developed, it has emphasized that the structure and quality of government policy responses are often functions of the interaction between the state and civil society. Kitschelt (1986), for example, argued that political opportunity structures in democratic nations determined the outcomes of anti-nuclear movements across Europe and the United States. The degree to which political input and output structures were weak or strong, he believed, channeled the efforts of social movements in predictable ways. He underscored that more open, pluralist systems allowed for policies which better represented new demands (Kitschelt 1986: 63). Boyle (1998) similarly argued that the ways that advanced industrial democracies responded to anti-nuclear movements were a function of state openness and state-society differentiation. That is, the degree to which citizens could have their voices heard in government agencies — or the degree to which they are excluded from decision making processes — clearly influenced the ways that states responded to anti-nuclear challenges.

Brinkerhoff (1999) further articulated that societies with more democratic governance — that is, where civil society groups, nonprofit organizations (NPOs), and other nonstate actors could work both independently and in collaboration with the state — were ones with higher potential for economic growth and for better management. He emphasized the state relationships with civil society and the regime type heavily determined the space available for interaction. Levy's study (1999) of France also illustrated the need for feedback from civil society in achieving good governance. Where groups in civil society could push back against poorly designed plans or work collectively to support nascent ones, the French government developed better policies. McAvoy's (1999) study of controversial facility siting showed how negative feedback from affected communities halted what would have been less effective plans and forced developers to rethink their assumptions. Japanese authorities seeking to find acquiescent host communities for nuclear power plants regularly analyzed the social bonds of local communities and sought to use this knowledge to find areas with the least capacity for resistance (Aldrich 2008).

This study builds on these studies and characterizes the relationship between the government and civil society in terms of the openness of the state's input structures. Societies where citizens can access decision makers, have their opinions heard, and alter state policies to a significant degree are classified as having more *open input structures*. In such countries citizens and politicians engage in constructive disagreement and civil servants and government officials remain embedded in positive and negative feedback loops. Residents' feedback may alter plans set in place and popular support for new policies can result in their enlargement. In contrast, nations where deci-



sion makers are more insulated from the public, where only certain interests are heard (if any), and where inputs from citizens are ignored or overlooked are classified as having *more closed input structures*. In such states residents may respond angrily to plans for unwanted facilities but have little chance of altering the proposal. State decision makers in closed input structure states may feel threatened by negative responses and can respond with the use of censorship or coercive force to end criticism of their policies.

Scholarship has shown a tight link between the ability of citizens to have their voices heard and broader trust in the government. In societies where citizens have low efficacy and believe their ideas and desires will not permeate into actual policy, they tend to have lower trust in government. In turn, lower trust creates less desire to monitor and police decision makers, who may then do even less to enact the “general will.” A negative spiral can arise where citizens disengage from their own government, lose trust in authorities thereby making government itself more insular and aloof. In Italy, for example, northern authorities interacted positively with civil society groups over hundreds of years, creating an environment which facilitated trade, economic growth, and innovation. In contrast, southern government authorities did little to encourage the public’s faith in their activities and became less responsive to their needs, setting the stage for stunted growth (Putnam 1995).

The next axis of state characteristics relevant to this study is that of state capacity (Linz and Stepan 1996). The most basic form of capacity relates to the monopoly over legitimate force. Max Weber long ago defined a state in terms of its ability to do so when he pointed out that “The state is a human community that (successfully) claims the monopoly of the legitimate use of force within a given territory” (Weber 1919 [1958]: 212). Pragmatically, states need to be able to control events within their borders and prevent rival groups — whether terrorists, political opponents, or other domestic interest groups willing to use violence — from effectively challenging their rule. Somalia, for example, serves as a core example of a failed or weak capacity state because of the government’s inability to keep warlords from controlling trade, exchange, and police functions (cf. Tilly 1992). Beyond coercive force, scholarship has further characterized state capacity in terms of administrative and extractive strength (Hendrix 2010; Hanson and Sigman 2011; Young 2013).

Administrative capacity refers to the ability of the state to gather, organize, and analyze relevant information which informs its decision making and its policies. A well-trained elite cadre of civil servants drawn from specialized academics (such as those in Japan trained at the Law Faculty of Tokyo University or in France at the *École Nationale d’Administration*) is seen as furthering the state’s interest more than inexperienced political cronies filling critical positions across the bureaucracy. Nation states with an effective, transparent, and honest bureaucracy can better achieve effective policy. Finally, extractive capacity refers to the ability of the state to extract revenues — often through taxes — from the population to fund its programs, military expansion, and so forth. States with higher extractive capacity can leverage natural resource endowments, such as oil and mineral wealth, into long term development funds, while other nations often struggle to ensure that the citizens — and not kleptocrats or warlords — benefit from such endowments. Norway and Nigeria both have extensive oil resources, but Norway has managed to secure its endowments



to provide long term subsidies to residents and extensive educational opportunities, while Nigeria has suffered from its “resource curse” and struggled to keep from disintegrating due to civil war.

Development specialists, bureaucrats, and scholars have worked to assess levels of state capacity through provision of goods and services, repressive force, and the administration of democratic processes (cf. Carbonetti 2012). A number of indicators compiled into lists such as the Polity Index, World Bank and Transparency International provide quantitative ways of classifying the capacity of states along these lines. Further research has argued that states with high levels of democracy and high quality bureaucracies have higher GDP and better outcomes for their citizens while those without these have lower GDP and worse health and economic outcomes. Table 1 sets up four states to illustrate the combinations of capacity levels and openness of input structures.

Table 1. Interaction between Government Capacity and Input Structures

	<i>Low Government Capacity</i>	<i>High Government Capacity</i>
<i>Closed input structures</i>	Haiti	China
<i>Open input structures</i>	India	Japan

States like India and Japan have relatively open input structures, in that citizens have a number of avenues through which their voices can be heard. These include institutionalized channels such as responsive political parties and public hearings but also informal channels such as protest, lawsuits, riots, and hunger strikes. In contrast Haiti and China allow fewer avenues for citizen voices to be heard; Haiti because it is difficult for average citizens to find ways to access into the very weak state and China because it has deliberately repressed dissent and attempts at broader consensual decision making. China and Japan, though, both have far higher capacity than Haiti and India, which are hamstrung in their ability to gather information, collect revenues, and enforce state mandates. I now investigate how the intersection of capacity and input structures mattered during four disasters over the past decade in these countries.

Japan

On 11 March 2011 a massive earthquake occurred off the coast of the Tohoku region in northeast Japan. The 9.0 earthquake damaged some structures in the area, but the greatest damage was inflicted by the tsunami which struck some 40 minutes later. The earthquake and tsunami in turn set off a technological disaster, knocking out the back up cooling systems in use at the Fukushima Dai-ichi nuclear power plant in Fukushima prefecture. Three of the reactors suffered explosions



caused by the build up of hydrogen, and with the diesel generators and batteries offline, they had full fuel melt downs. Japanese authorities and the private utility Tokyo Electric Power Company (TEPCO) which built and manages the reactor are still struggling to contain radioactive contamination caused both by the meltdowns and by ongoing attempts to cool the reactor. More broadly, some 17,000 died because of the tsunami, and more than 300,000 evacuated the area because of the combination of natural and manmade disasters.

In the immediate aftermath with critical infrastructure heavily damaged, many NGOs and citizen groups stepped in to assist with the recovery and relief efforts. Private helicopter clubs self-organized to deliver food to isolated areas and religious groups and volunteer associations traveled in their own vehicles to drop off supplies. As the search and rescue period tapered off, there were tremendous lines for necessities and basics such as diapers and water, but there were no reports of looting or social unrest. People stayed calm as they stood outside for six or more hours and many local governments worked to secure temporary housing for displaced people by housing them with neighbors and kin.

The government of Japan set up the National Reconstruction Agency and various committees began looking into the causes of the Fukushima Dai-ichi nuclear meltdowns, including the newly formed Investigation Committee on the Accident at the Fukushima Nuclear Power Stations of Tokyo Electric Power Company. These reports admitted that the accident at Fukushima were “man made” and preventable, and criticized the political economy of nuclear energy which had created an insular decision making process for the field. Acknowledging public criticism of the fact that the same government agency that promoted nuclear power — the Ministry of Economy, Trade and Industry (METI) — was also responsible for regulating it, decision makers moved to separate out a new regulatory authority for atomic energy. The Nuclear Regulation Authority, or NRA, now sits separately from the other central government ministries and has been tasked with drawing up new guidelines for the field. Its employees have come from the Ministry of the Environment in an attempt to create more independence from the field of energy. When members of the NRA broke their own internal rules and privately met with representatives of the energy utilities, they fired those employees responsible and publicly apologized. Of the 54 nuclear reactors active before the compounded disaster, the government only allowed two to restart following the event. As of the summer of 2013, with broad public sentiment against nuclear power, the current ruling party — the Liberal Democratic Party — has announced its plans to restart reactors, but it will require the support of local communities and politicians to do so.

During the broader reconstruction process, the central government ministries have directed much of the budget for rebuilding, often restarting large scale, public works projects which had been suspended or shelved before the accident. Nevertheless local governments, residents in affected communities, and nongovernmental organizations have worked to create a new set of bottom up, innovative, and participatory projects which tap into local ideas and seek to involve residents from the beginning. Additionally, because data on radiation levels was slow to be released, citizens around Japan took the initiative to begin recording radiation levels with their own Geiger counters and reporting the results on websites such as Safecast. This practice has enhanced citizen



science the process by which normal residents take responsibility for collecting and analyzing data on problems important to them (Aldrich 2013). While the compounded disaster in Japan had the potential to cause tremendous harm, a combination of high building standards, disaster mitigation practices such as evacuation drills and seawalls, and citizen involvement in recovery kept the number of casualties beneath 20,000. Further, in the recovery process itself, democratic pressures have altered regulatory institutions and allowed for citizens to collect and analyze data on their own.

China

On 12 May 2008, a 8.0 magnitude earthquake struck Sichuan Province in western China. Roughly 88,000 people died — among them thousands of children — when numerous public buildings, including schools and hospitals collapsed. 4 million homes collapsed as did many private factories in the region. The event — known as the Great Sichuan or Wenchuan Earthquake — took place some 50 miles west from the provincial capital of Chengdu. Approximately 370,000 were injured and 5 million residents were left homeless; the affected area was more than 38,000 square miles. 30,000 kilometers of water pipes and other infrastructure were destroyed. Later cascading failures complicated the recovery process as floodwaters in the area spilled out from new lakes formed by local mudslides. The Ministry of Housing and Urban-Rural Development ordered that 1 million temporary residences would be completed within three months. By November of the same year the government announced it would spend more than \$150 billion to rebuild local homes and economies. Some villages were moved in their entirety some 30 to 40 km away from their initial location to less vulnerable sites.

While government capacity allowed the direction of resources to the rebuilding process, a lack of regulation over construction projects multiplied the effects of the quake. Parents protested the low quality construction of the schools which had resulted in the deaths of many of their children. During the quake, some 12,000 schools in Sichuan and 6,500 in Gansu were destroyed (UNICEF 2010). Locals called the school projects “tofu dregs” or “tofu skins” due to their weakness. Following the collapse of the schools, “[g]rieving parents accused local officials of corruption and cutting corners, setting off a storm of criticism of the government” (Carlson 2013). Several reports pointed out that schools in the region which had been funded by donations from Hong Kong — and whose construction had evidently been to a higher quality — did not collapse during the 2008 earthquake which struck the same area. Reporters underscored that “[t]he Hong Kong -funded school buildings in Lushan county, Yaan, were not badly built and would be safe after maintenance, mainland housing authorities said after an initial investigation on Wednesday” (Zhai and Ng 2013). Some five years earlier, Chinese state security forces had suppressed protests against the school collapse, often detaining or arresting those local parents or activists who spoke to the media on the issue. The exact number of children killed in the 2008 earthquake is not known; some have estimated that as many as 10,000 may have perished due to shoddy engineer-



ing and lack of effective regulation. Within two months, some reported that local governments offered bereaved parents up to \$9000 (US) on condition that they would not raise their voices.

Chinese state authorities evidently influenced media coverage of the disaster and the recovery process. One comparative study (Liu 2010) of United States and Chinese media sources on the 2008 earthquake showed very different frames and approaches used by newspapers. Namely, in China, "...the media played the role of a "guard dog" for the Party, upholding the government and the dominant ideology" (58). This contrasted with the North American media, which used a variety of frames in their approach, including human mortality and damage, in their coverage of the disaster. Liu showed that either direct Chinese governmental control over the media or a concern about state intervention drove Chinese newspaper coverage, as the constitution itself says that Chinese citizens must defend "the security, honor, and interests of the motherland" (62). No such restrictions govern the press in the United States where press coverage of past disaster response — such as that for Hurricane Katrina — criticized the government directly and suggested alternate ways of responding in future disasters.

India

On the morning of 26 January 2001, a 6.9 magnitude earthquake struck India some 12 miles northeast of Bhuj in the state of Gujarat in the northwestern part of India. 20,000 died and some 170,000 were injured, with almost 600,000 homes destroyed by the quake, leaving more than 600,000 housing. 1.7 million residents were left homeless across the area. Estimates of the cost of the damage ranged as high as \$5 billion (US). It remains the most deadly earthquake in India to date. The government immediately activated the National Disaster Management Control Room and sent in army troops to assist with the search and rescue efforts, so that more than 25,000 rescue teams and personnel were deployed within days to the area. Unfortunately, due to damage to roads and other transportation infrastructure, many could not reach the survivors in remote village areas. As the Indian government was still handling the lasting effects of floods from 1999, it sought assistance from the international donor community and organizations like the Asian Development Bank (Duenas 2011).

Along with the official response from the Government of India, private aid organizations and nongovernmental organizations (NGOs) alike sought to assist the survivors with medical assistance, housing construction, and food and water. Some 14 NGOs worked together under the Kutch Navnirman Abhiyan grouping. The government of Gujarat set up the Gujarat State Disaster Management Authority to manage the recovery process and soon planned \$1 billion in reconstruction projects (Sinha n.d.). Some observers labeled the authority's approach as "systematic and scientific" because it used approaches such as public private partnerships to create high quality infrastructure (Mahurkar 2004). Indian government officials argued that the quake changed the way future disasters will be handled. In a retrospective conference paper, one Indian civil servant argued that "[t]he Gujarat earthquake resulted in a paradigm shift in the policy of the



Government from relief and humanitarian assistance oriented post-disaster intervention to a proactive prevention, mitigation and pre-disaster preparedness” (Thiruppugazh 2007).

Despite such praise and hope for future responses, scholars underscored that the process of rehabilitation was not as participatory as hoped and that a number of obstacles undermined recovery. Bremer (2003) argued that a number of factors reduced the quality of the response to the disaster, including the Indian government’s excessive bureaucracy, underdeveloped disaster response policy, and irrelevant relief provision. Sanderson and Sharma (2008) underscored how many of the recovery plans put in place in areas such as housing ignored local citizen input and neglected to include bottom-up participation. Observers argued that the state focused its aid delivery and assistance to the rural areas such as Bachau, Rapar, and Anjar, overlooking the needs of middle class residents in more urban areas. Observers also underscored the weak regulation of construction in the area. “While there is no national law regarding the enforcement of building codes, these codes have been incorporated into the by-laws adopted by the municipal corporations” (Vatsa 2001: 23).

The lack of financial capacity and, in some cases, administrative and technical capacity weakened the Indian government’s response to the disaster. However, its open input structures allowed the participation of NGOs and decision makers at least claimed that they hoped to incorporate bottom up participation in the process.

Haiti

On 12 January 2010 a 7.0 magnitude earthquake struck some 16 miles from Haiti’s capital of Port-au-Prince. The event killed at least 220,000 people and injured 300,000, causing the collapse of 250,000 homes and some 30,000 office and factory buildings. More than a million people were left homeless. Critical government infrastructure was destroyed, including the Presidential Palace, the National Assembly, and the headquarters of the United Nations Stabilization Mission, and many of the civil servants and specialists at these agencies perished. One-quarter of the civil servants employed by the Haitian government passed away. Additionally, transportation, communication and other networks were destroyed by the quake.

Because of Haiti’s status as a failed state and the fact that it “...has endured political instability, chronic challenges in governance and the highest levels of poverty in the Western Hemisphere” (Rencoret et al. 2010: 8) many residents of the nation suffered from extreme vulnerability well before the earthquake. The United Nations Stabilization Mission in

Haiti (MINUSTAH) had been established in 2004 as a care taker, assisting the government with issues such as security, elections, and human rights protection. (MINUSTAH itself had a number of its personnel killed in the quake with at least 36 killed and more than 300 missing or unaccounted for (Taft-Morales and Margesson 2010).) WHO reports stated that roughly half of Haitians lacked access to clean drinking water and a similar percentage lacked access to health care before the quake. Because of a lack of space, malnutrition, overcrowding, sanitation related



diseases, and vector borne diseases were serious challenges for responders to the disaster (WHO 2010). The nation also suffered from tremendous underemployment (roughly three-quarters of people lived on \$2 (US) a day or less) and widespread slum conditions.

Following the collapse of many structures and the damage done to those remaining, some 1.5 million people moved into overcrowded, unsanitary temporary camps. Because of difficulties in distributing sufficient food to the huge number of survivors, violence and looting broke out a number of times. When aid workers went to distribute food to internally displaced person camps, they often required military escorts due to concerns over security (Rencoret et al 2010: 22). Further, cholera and other infectious diseases claimed the lives of close to 6,000 and affected more than 200,000 well after the earthquake. Three years after the earthquake, despite more than \$7.5 billion in aid, 500 tent camps remained in place providing shelter to 360,000 Haitians.

When donors sought to assist the state in rebuilding, they often had to work around the weak and volatile national government (Sontag 2012). Few ministries had sufficient funds, organization, or personnel to carry out their administrative responsibilities. “A governance review of the health sector carried out by the Ministry of Health in 2007 shows that leadership and regulatory functions in Haiti were “weak or very weak” at the central, departmental, and periphery levels” (de Ville de Goyet, Sarmiento, and Grunewald 2011: 4). Overall, Haiti had very low governmental capacity before the earthquake and the disaster reduced that capacity even further. Further, with a care taker government in place, few financial resources, and a “brain drain” of talented Haitians to country like the US and Canada, the country had relatively closed input structures for average citizens.

Table 2 below summarizes the four earthquakes used here as case studies.

Table 2. Four disasters and their outcomes

Disaster	Earthquake Magnitude	Number Killed	Impact
26 January 2001 Gujarat earthquake	6.9	20,000	400,000 homes destroyed
12 May 2008 Sichuan earthquake	8.0	88,000	5 million made homeless
12 January 2010 Haiti earthquake	7.0	220,000	250,000 homes destroyed
11 March 2011 Tohoku triple disaster	9.0	19,000 (tsunami)	300,000 evacuated



Discussion and Conclusions

This article has used four megacatastrophes over the last decade or so to illustrate the interaction between input structures and state capacity during and after disasters. Perhaps the most obvious lessons is that in societies with poorly responsive or failing states, existing social and infrastructure vulnerabilities multiplied the impact of the event. Weak political institutions in nations like Haiti and India meant that decision makers were often unable to create or enforce building codes, so even relatively weak seismic events created large numbers of casualties.

Even though the Haiti earthquake was far less powerful than its counterparts in China and Japan, the trembler claims far more lives. Similarly, the relatively weak Gujarat quake claimed more lives than those taken by the earthquake and tsunami together in Japan. China, despite widespread financial and coercive capacity, had not sufficiently invested in building codes pre-disaster, and therefore the lives of many children and residents were lost. Broadly speaking, countries with low capacity and little bottom up input had lower regulatory standards for built structures, which then collapsed quickly, raising the casualty count and creating tremendous suffering.

More responsive governments invested in early warning systems and raise engineering standards to meet international expectations. Japanese authorities had tsunami warning measures in place along with significant investment in tsunami and earthquake countermeasures, including tsunami shelters, evacuation drills, seawalls, and disaster response plans. Poorer countries are unable to invest in risk reduction measures to this degree and therefore faced significantly more damage from the same level event.

Japan and India had more open input structures, meaning that post-disaster authorities at least recognized the need to demonstrate that they listened closely to the demands of the public. Following the melt downs at the three Fukushima reactors, regulators moved to separate out the overseers for the atomic energy industry from the same organizations responsible for promoting it over the last half of the 20th century (Aldrich 2008). Local citizens had the latitude and lack of censorship to collect, publish, and analyze their own data on radiation contamination levels. Indian authorities spoke openly of the need to incorporate the desires of local citizens and to seek to keep their needs in mind when building Gujarat back. In contrast, the Chinese government suppressed and then co-opted those who criticized the school collapse as a function of bribery or incompetence. The Haiti government had little need to respond at all to demands because most citizens felt disconnected from their state and uninterested in engaging it through collaboration or discourse.

Recent scholarship on resilience to disaster at the communal level has underscored the role of intangible societal characteristics – such as social capital and social networks – in helping affected areas bounce back from adversity. Strong social bonds provide assistance during and after disaster through several mechanisms: strengthening voice and limiting exit, increasing the capability for collective action, and creating networks of informal insurance and mutual aid (Aldrich 2012). In the same way that at the communal level social characteristics matter for disaster resilience and recovery, so too national level relationships between the state and society strongly predict the effectiveness of the recovery efforts along with likely mortality from crises.



A combination of low capacity and lack of access points for citizens created a situation where Haitians were incredibly vulnerable to the earthquake. Japanese strong rule of law, high government capacity, and democratic governance allowed for an effective response to the compounded disaster along with movement towards reform of poorly performing institutions (such as governance of the nuclear industry). Much of the disaster response industry is a reactive one, driven by the most recent disaster or crisis abroad. But these results indicate the need to take building transparent governance, citizen-state trust, and legitimacy in nations across the world. It is precisely the weakest states where citizens feel the most distance from their decision makers, and it is in these countries where outside agencies – whether state organizations like DFID or USAID, or non state actors such as Amnesty International, Transparency International and WorldVision – should push the hardest to improve governance. The increasing trends of the number of disasters and the rising economic costs from these disasters should focus our attention on improving the ways that states listen to and interact with their citizens. Increasing state legitimacy and capacity will improve disaster responses and survival around the world. ■



References

- Ahn, Deongsang, Bradford, John, Newberry, James, and Wescott, Harold. (2012). The Case for Establishing a Civil-Military Disaster-Relief Hub in Northeast Asia. *Asia Policy* Vol. 14 pp. 51-78.
- Aldrich, Daniel P. (2008). *Site Fights: Divisive Facilities and Civil Society in Japan and the West*. Ithaca NY: Cornell University Press.
- Aldrich, Daniel P. (2012). *Building Resilience: Social Capital in Post-Disaster Recovery*. Chicago IL: University of Chicago Press.
- Boyle, Elizabeth. (1998). Political Frames and Legal Activity: The Case of Nuclear Power in Four Countries. *Law and Society Review* Vol 32 No 1 pp. 141 -
- Bremer, Rannveig. (2003). Policy Development in Disaster Preparedness and Management: Lessons Learned from the January 2001 Earthquake in Gujarat, India.
- Brinkerhoff, Derick. (1999). Exploring State—Civil Society Collaboration: Policy Partnerships in Developing Countries. *Nonprofit and Voluntary Sector Quarterly* December 1 28 pp. 59-86.
- Carbonetti, Benjamin C. (2012). The Cards Dealt Matter: Rethinking Conceptions of State Capacity. Prepared for the Annual Meeting of the Western Political Science Association March 22-24, Portland Oregon.
- Carlson, Benjamin. (2013). Sichuan earthquake: China's government praised for swifter reaction than 2008 quake. *Global Post* 22 April.
- De Ville de Goyet, Claude, Sarmiento, Juan Pablo and Grunewald, Francois. (2011). *Health response to the earthquake in Haiti January 2010*. Pan American Health Organization.
- Duenas, Maria. (2011). Rising from the rubble: Reconstruction and rehabilitation after the 2001 Gujarat earthquake. ADB Knowledge Showcases July pp 35-36.
- duPont, W and Noy, Ilan. (2012). What Happened to Kobe? University of Hawaii Working Paper 2012-04.
- Hanson, Jonathan and Sigman, Rachel. (2011). Measuring State Capacity: Assessing and Testing the Options. Paper prepared for the 2011 Annual Meeting of the American Political Science Association September 2011.
- Head, Brian. (2008). Wicked Problems in Public Policy. *Public Policy* Vol. 3 No. 2 pp. 101-118.
- Hendrix, Cullen. (2010). Measuring state capacity: Theoretical and empirical implications for the study of civil conflict. *Journal of Peace Research* 47(3) pp. 273–285.
- Kenny, Charles. (2012). Disaster risk reduction in developing countries: costs, benefits, and institutions. *Disasters* Vol 36 Issue 4 pp. 559 – 588.
- Kitschelt, Herbert P. (1986). Political Opportunity Structures and Political Protest: Anti-Nuclear Movements in Four Democracies. *British Journal of Political Science*, Vol. 16, No. 1 pp. 57-85.



- Levy, Jonah. (1999). *Tocqueville's Revenge: State, Society, and Economy in Contemporary France*. Cambridge MA: Harvard University Press.
- Linz, Juan and Stepan, Alfred. (1996). *Problems of Democratic Transition and Consolidation: Southern Europe, South America and Post-Communist Europe*. Baltimore, Md.: The Johns Hopkins University Press.
- Liu, Daqi. (2010). A comparative look at the coverage of the Sichuan earthquake in Chinese and American newspapers. Unpublished master's degree thesis for Iowa State University.
- Mahurkar, Uday. (2004). The high road to recovery. *India Today* 27 September.
- Mysiak, J., Galarraga, I., Garrido, A., Interwies, E., van Bers, C., Vandenberghe, V., Farinosi, F., Foudi, S., Görlitz, S., Hernández-Mora, N., Gil, M. and Grambow, C. (2012). The value of knowing better: Losses from natural hazards. *Geophysical Research Abstracts* Vol. 14 EGU 201 14091.
- National Hurricane Center. (2009). Tropical Cyclone Report: Hurricane Gustva. AL072008.
- Rencoret, Nicole, Stoddard, Abby, Haver, Katherine, Taylor, Glyn and Harvey, Paul. (2010). *Haiti Earthquake: Response Context Analysis*. Humanitarian Outcomes.
- Sanderson, David and Sharma, Anshu. (2008). Winners and losers from the 2001 Gujarat earthquake. *Environment and Urbanization* 20(1) pp. 177-186
- Sinha, Anil. (n.d.). The Gujarat Earthquake 2001. Asian Disaster Reduction Center.
- Sontag, Deborah. (2012). Rebuilding in Haiti Lags After Billions in Post-Quake Aid. *New York Times* 23 December.
- Taft-Morales, Maureen and Margesson, Rhoda. (2010). *Haiti Earthquake: Crisis and Response*. Congressional Research Service. January 15.
- Thiruppugazh, V. (2007). What has changed after the Gujarat earthquake of 2001? Paper prepared for the Asian Science and Technology Forum.
- UNICEF. (2010). Sichuan Earthquake: Two year report. Beijing.
- Vatsa, Krishna. (2001). The Bhuj Earthquake District of Kutch, State of Gujarat (India): A Reconnaissance Report Identification of Priority Issues
- Weber, Edward and Khademian, Anne. (2008). Wicked Problems, Knowledge Challenges, and Collaborative Capacity Builders in Network Settings. *Public Administration Review* Vol. 68 No. 2 pp. 334-349.
- World Health Organization (WHO). (2010). *Public health risk assessment and interventions*. January.
- Zhai, Keith and Ng, Joyce. (2013). Hong Kong-funded schools survive Sichuan earthquake. *South China Morning Post* 26 April.



Author's Biography

Daniel P. Aldrich

Purdue University

Daniel P. Aldrich is associate professor and University Scholar at Purdue University and, during the 2012-2013 academic year, a Fulbright research professor at Tokyo University. He was an American Association for the Advancement of Science fellow at USAID during the 2011-2012 academic year. He has been a Visiting Scholar at the University of Tokyo's Law Faculty in Japan, an Advanced Research Fellow at Harvard University's Program on US-Japan Relations, a Visiting Researcher at Centre Américain, Sciences Po in Paris, France and a Visiting Professor at the Tata Institute for Disaster Management in Mumbai, India.

His research interests include post-disaster recovery, the siting of controversial facilities, the interaction between civil society and the state, and the socialization of women and men through experience. His work has been discussed in New York Times, CNN, the State Department's Media Hub, the National Bureau of Asian Research, etc. On May 2011 the Purdue Exponent named him among the "Top 5 Professors who have influenced international and national events." In July 2012 his New York Times Op-Ed on disaster recovery was named as one of the five best columns in the Atlantic Wire.

Daniel's first book, *Site Fights: Divisive Facilities and Civil Society in Japan and the West*, was published by Cornell University Press in 2008 and was republished (as a 2nd edition paperback) in May 2010 and was translated into Japanese by Sekaishissha Publishers. The book has been reviewed in more than 18 journals and on several blogs. It has been mentioned by French Nonfiction and Greenfieldoptimist and Japan Focus as well.

His second book *Building Resilience: Social Capital in Disaster Recovery* was published in the summer of 2012 by the University of Chicago Press. Additional publications on disaster recovery include "Strong Civil Society as a Double-Edged Sword: Siting Trailers in Post-Katrina New Orleans" with Kevin Crook in *Political Research Quarterly*, "Social, Not Physical, Infrastructure: The Critical Role of Civil Society after the 1923 Tokyo Earthquake" in the *Journal Disasters* (this paper won the best paper award from the Public Policy Section), "Fixing Recovery: Social Capital in Post-Crisis Resilience" in *The Journal of Homeland Security*, "Separate but Unequal: Post Tsunami Aid Distribution in Southern India" in *Social Science Quarterly*, "The Power of People: Social Capital's Role in Recovery from the 1995 Kobe Earthquake" in *Natural Hazards*, "The Externalities of Strong Social Capital: Post-Tsunami Recovery in Southeast India" in *Journal of Civil Society*, and a review of several books on disaster in *Perspectives on Politics*.

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- Young-Hwan Shin, the Executive Director of EAI Fellows Program
Tel. 82 2 2277 1683 (ext. 112) fellowships@eai.or.kr
- Typeset by Young-Hwan Shin

