

Chapter 2

Disasters, Development, and Resilience: Exploring the Need for Comprehensive Vulnerability Management

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2.1 Introduction

The United Nation defines disaster as “an event or series of events which gives rise to casualties and/or damage or loss of property, infrastructure, essential services or means of livelihood on a scale which is beyond the normal capacity of the affected community’s ability to cope with out aid” (DMTP 1994, p. 12). Disasters are a result of hazards that impact human and built environments, thus suggesting that nature, people, buildings and infrastructure interact in complicated ways. Disasters are therefore serious problems as they create devastating short-term and long-term impacts on a community, nation, or region. These events affect human lives, property, employment, infrastructure, and environment (Seneviratne et al. 2010). Furthermore, disasters tend to overwhelm existing resources which compels the affected community to seek outside assistance (Novick 2005).

Several disasters have generated world-wide attention recently. Some become catastrophic, resulting in unimaginable casualties, deaths, and property damage. The impact of these events expands to a much larger population and geographic area, making the recovery effort very difficult, costly, and time consuming. For instance, the Indian Ocean Tsunami traveled as far as 3,000 miles to Africa, affected more than five nations, and caused about 350,000 deaths making it one of the deadliest disasters in history (Resosudarmo and Athukorala 2005). Almost 6 years after Hurricane Katrina, victims are still struggling to recover from the impact of the disaster. Housing and infrastructure systems have not been fully repaired or replaced. The 2010 Haiti earthquake killed over 222,500 people (UNISDR 2011). Making matters worse, health concerns—such as contaminated water and food sources—caused a cholera outbreak, which further added to the number of people affected by the disaster. The 2011 earthquake, tsunami and nuclear reactor leak in Japan were also noteworthy (See Chap. 22 in this volume). They caused about 19,846 deaths, affected 36,8820 people, and generated damage of about

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210,000 billion US\$ (EM-DAT 2012). The social and emotional impact of the disaster is also heartbreaking. Physiological impacts such as anxiety, fear, feeling of helplessness, and post-traumatic stress disorder may affect victims self confidence and attitude towards life.

The effects of disasters are even more widespread than recognized. The 2010 British Petroleum oil spill in Gulf of Mexico contaminated numerous water sources, and affected many bird and marine species. Meanwhile, the rising terrorist threat has jeopardized the very notion of “peace and prosperity,” and has resulted in societal breakdown and hostility among various social groups (Harding 2007; Perrow 2008). The increasing animosity between a radical minority of the Muslim community and westerners post 9/11 terrorist attacks seems to confirm this claim.

Most importantly, disasters hinder development (Fordham 2007; Harding 2007; Manyena 2012). The economic and infrastructure damage caused by disasters is often unimaginable and may lead a nation into a recession. After a disaster, the focus will mostly divert away from development projects and towards disaster recovery (like restoring damaged infrastructure and uplifting the lost economic condition). The situation will be even worse in developing countries as they often lack resources (financial, educational, workforce, etc.) to effectively deal with disasters (Kusumasari et al. 2010; Pokhrel et al. 2009; McEntire 2011). Hence, disasters are serious problems. They not only hamper physical well-being and disrupt our social activity, but they also hinder a nation’s development process. Deaths, injuries, disruption, population displacement, and ecosystem misbalance all erode social livelihood and hinder sustainable development.

With these in mind, the chapter examines the complicated but yet important relationship between disaster and development through the perspective of vulnerability. The chapter begins by discussing disaster trends worldwide and the anticipated impact of future disasters. It then looks into the role of different physical, social, economical, cultural and political factors that play a vital role in disaster risk reduction. Lastly, the chapter stresses on the need for a new kind of development strategies that reverses the social construction of disaster. The chapter concludes by providing implication to practitioners, and direction on future research.

2.2 Rising Disasters

Researchers claim that the number of disaster is increasing rapidly, and anticipate that future disasters will be larger and more destructive due to significant problems like growing urbanization, population growth, and environmental degradation (Sylves 2008). Although the exact number is controversial (Alexander 2006; Collins 2009), statistical records confirm that disasters are increasing in frequency (Alexander 2006; Bouwer et al. 2007; Collins 2009; Perrow 2008; Seneviratne et al. 2010). According to International Disaster Database, the number of natural disasters reported worldwide has increased from about 50 in 1950 to almost 430 in 2010 (EM-DAT 2012). In 2010 alone, 373 natural disasters killed over 296,800 people, making 2010 the deadliest years in at least two decades (UNISDR 2011). Similarly,

the number of technological disaster reported worldwide has continuously increased from about 15–20 in 1950 to approximately 360 in 2007 (EM-DAT 2012). Besides natural and technological disasters, the differences in social, cultural, political and religious ideologies and values have resulted in various mass-protests, terrorist attacks, and civil war. The recently observed Arab Spring—including conflict in Syria, Libya, Tunisia, and Egypt—reflect growing differences among the public and the ruling government.

Concomitant with the increase in disaster occurrence, human losses as well as economic and environmental impact are also escalating. The overall number of people affected by disasters has been growing by 6% each year since 1960 and this number is expected to continue in future (UN 2012). Worldwide, the number of deaths between 1991 and 2000 was 939,007, which increased to 1,313,183 between 2001 and 2010. Meanwhile, people affected by disasters have risen from 2,426,321,086 between 1991 and 2000, to 2,676,416,290 between 2001 and 2010. In 2010 alone, reported deaths and the number of people affected worldwide were 304,476 and 304,387,659 respectively (EM-DAT n.d.). Besides the growing physical loss, the economic loss due to disaster has also increased from 54 billion US\$ in 1980 to almost 210 billion US\$ in 2011 (EM-DAT/UNISDR n.d.).

At present, environmental degradation also poses a threat for all locations irrespective of their proximity to hazards (Thomalla et al. 2006). Although the actual impact of environmental mismanagement is still unknown, many scholars predict that climate change may exacerbate the severity of future disasters, resulting in super-hurricanes and tropical cyclones, long-term sea level rise, extreme temperatures, long term droughts, high levels of precipitation, and large-scale flooding (Alexander 2006; O'Brien et al. 2006; Seneviratne et al. 2010; Thomalla et al. 2006). Bouwer et al. (2007) note that the global costs of weather-related disasters have also increased from an annual average 8.9 billion US\$ between 1977 and 1986 to 45.1 billion US\$ between 1997 and 2006. The U.S. National Weather Service data also indicates an increase in weather related fatalities. According to the data, there were 138 fatalities in 2010 which increased to 206 in 2011, making the number well above the 10-year average for heat related fatalities (NWS 2012).

It is true that hazards that lead to disaster cannot be completely avoided (O'Brien et al. 2006). However, better understanding of the causes and effects of disasters can provide helpful insights to deal with them more effectively (McEntire 2005, 2011). Knowledge about disaster management strategies, followed by strong policies that support good practices and lessons learned, can help us manage disasters more successfully (McEntire 2005, 2011; Seneviratne et al. 2010).

2.3 Disaster and Development

Contradictory to the term disaster—which has a negative connotation—development often, but not always, has a positive and progressive implication. Development is equated to economic prosperity, technological advancement, poverty reduction, modern amenities, education, freedom, and perhaps even equality. Although the

two terms—disaster and development—tend to divert society towards opposite directions, these two concepts are undoubtedly related to each other. According to Fordham (2007) “Many [scholars] (Collins 2009; Manyena 2012; Schilderman 1993; O’Brien et al. 2006) are now realizing that there is strong connection between disaster and development” (p. 345). The Disaster Management Training Programme (1994), McEntire (2004) and Fordham (2007) indicate four ways in which disaster and development support and conflict each other: (1) development increases vulnerability to disaster, (2) development reduces vulnerability to disaster, (3) disaster sets back development, and (4) disaster provides development opportunities. Despite of the growing acceptance of this close relationship between disaster and development, many challenges like political conflict, lack of coordination, and resource inadequacy makes this integration mere rhetoric (Manyena 2012). Nonetheless, development and disaster management activities should be integrated and go hand-in-hand in order to alleviate future impacts of disasters. Development has both advantages and disadvantages which further affects vulnerability to disasters. “Development investments and projects are almost never risk-neutral; they can either increase or reduce vulnerability” (O’Brien et al. 2006, p. 70).

2.4 Development Increases Vulnerability

Poorly planned development interventions can become a source of hazard which further erases the benefits of development investments (O’Brien et al. 2006; McEntire 2004). For instance, the use of low quality construction materials and poor building techniques during development increases vulnerability to disasters. Likewise, development may also be related to other factors that induce disaster impacts such as population growth, urbanization, and human activities that deteriorate the environment. For instance, the economic prosperity and comfort associated with development attracts numerous people to cities resulting in urbanization, population growth, and high density. All of these factors will intensify disaster losses in future (Alexander 2006; Bouwer et al. 2007; Collins 2009). The existence of slums in some mega-cities like Mumbai, Delhi, and Dhaka also increases the chances of post disaster epidemic. Likewise, deforestation and encroachment of agricultural and forest land promotes urban sprawl, which make disaster response activities complicated (McEntire 2011). The advancement in information technology has increased our efficiency in commercial and communication arenas. At the same time, easy access to technology has increased the vulnerability associated with hackers and terrorist activities (Perrow 2008).

Disaster vulnerability is also growing due to global competition among nations; different countries are constructing high-rise buildings, expanding industries and manufacturing, nuclear energy and weapons. Development in construction technology has also contributed to construction of skyscrapers that are vulnerable to earthquake and terrorist attacks. Industrialization and the creation of new chemicals have increased vulnerability to anthropogenic disasters. Similarly, numerous nuclear

plants are present around the world, and can produce harmful radiation that have the potential to cause physical disabilities and impairment in multiple future generations; the ecological and environmental harm of this is unthinkable. According to Perrow (2008) “about one-half of U.S. population lives within 50 miles of a nuclear power plant, and with a large release and the right wind orientation it can create lethal impact to the population” , (p. 739). Many countries are now actively developing nuclear weapons, which can threaten the safety of future generations as well as destabilize international geo-political system.

2.5 Development Decreases Vulnerability

While development may indeed create vulnerability, it may decrease vulnerability as well (Collins 2009; Fordham 2007; McEntire 2004). With the advancement in science and technology, we are now able to identify and address hazards. There is much hardware (Ipad, laptop, radio, remote sensing equipment, unmanned vehicles, etc.) and software (Arc GIS, E-Team, worldwide webs, social networking sites, electronic print medias, etc.) that help in all types of emergency management activities. With the aid of GIS, emergency managers are now able to identify places and population that are in risk and adopt protective measures that reduce their vulnerability. Development has also made it possible to use technologies to make buildings and infrastructures that are more resistant to disasters. For example, in Peru, new building techniques along with locally available materials and locally trained work force were used to build earthquake resistant “quincha” houses (Schilderman 1993).

Similarly, development may also foster social and economic opportunities and promote acceptance of new values and cultures. Economic development activities often focus on poverty reduction through job creation. This may reduce vulnerability to disasters. Increased understanding and acceptance of diverse cultures may potentially lower conflicts among various religious and ethnic groups. Development has also expanded educational horizons; many emergency management professionals now have college degrees (Phillips et al. 2012). In United States alone, there are over 150 universities that provide fully developed college degrees (at the Bachelor, Master and PhD levels) in emergency management (Phillips et al. 2012). This could have a profound impact on the management of disasters.

Development also creates public awareness and may emphasize increased political participation for disaster management. Currently there are more special interest groups that advocate for a safe environment and effective disaster management. In the United States, the realization of a need to centralize and streamline emergency management functions has led to the establishment of the Federal Emergency Management Agency (FEMA) (Phillips et al. 2012). Development has also resulted in globalization of emergency management; there are many international organizations (e.g., International Federation of Red Cross, World Bank) that deal with disasters. The International Association of Emergency Mangers (IAEM) brings

emergency managers from all over the world together, and provides a platform to address common disaster concerns. There are also numerous international funds and relief organizations for disaster victims worldwide (Phillips et al. 2012). The United Nation is specifically very active in disaster and development issues and has programs (UNISDR, UNDP) that focus on disaster risk reduction and capacity building in developing nations. All of this may produce positive results for the future of emergency management.

2.6 Disaster Sets Back Development

Development is likewise set back by disasters at times (Manyena 2012; Fordham 2007; McEntire 2004). Disasters have social, economic and physical impacts, and hinder individual and community development in the long run (Kulatunga 2010). Hurricane Mitch caused an extensive damage to Honduras and Nicaragua in 1998, setting development back 20 years (O'Brien et al. 2006, p. 60). Likewise, Harding (2007) discusses the impact of massive human rights violation, wars, and political conflicts on Iraq's developmental activities; the social disruption in Iraq has hindered development activities in the country. When a disaster occurs, the resources allocated for development projects will also be diverted to disaster recovery activities (thereby making the community regressive). This, however, does not mean that resources should be diverted away from disaster recovery activities. Of course, resources are crucial to rebound from disasters. Nonetheless consideration should be on incorporating disaster mitigation strategies during development. This will not only provide a disaster resistant structure, but also lowers the amount of resources that will be used aftermath a disaster. For example, retrofitting buildings during construction increases resistance of the building and reduces vulnerability, which can significantly lower the amount of resources that goes into recovery activities in the future.

2.7 Disaster Provides Development Opportunities

Hazards and disasters often have low salience in the political agenda. Nonetheless, disasters also provide development opportunities for communities and nations (Fordham 2007; McEntire 2004). A major disaster can open a "window of opportunity" and help the issue move into the policy agenda (Prater and Lindell 2000; Sylves 2008). Research shows that many communities participate in better construction practices after disaster (Manyena 2012; Schilderman 1993). In the United States, the government became more alert about terrorist activities after the 9/11 terrorist attack. Likewise, the 2011 earthquake and Tsunami in Japan raised attention on potential harmful aspects of nuclear power plants. Similarly, the leadership and collaboration failures exhibited during Katrina (Waugh and Tierney 2007)

have forced the government to find ways to foster collaboration among sectors and governmental bodies. The importance of an integrated emergency management approach is highly valued after Hurricane Katrina. Communities with previous disaster experience also tend to adopt building technologies that increases the resistance of the buildings (disaster subculture). Likewise a city that was completely destroyed by a disaster may seek to adopt planning strategies that reduce vulnerability to future disasters. Nonetheless, the lack of resources often acts as a barrier to incorporate effective development practices. This is why despite having many devastating experiences with disaster, many of the developing nations are still ill prepared for future hazards.

2.8 The Need to Integrate Perspectives

As can be seen, development and disasters are closely related. A single framework that integrates the two concerns is not only desirable, but is a necessary step for both effective disaster management and good development practices (Collins 2009; Manyena 2012). The method of integrating the two may vary according to context and situation. Despite possible differences, methods of reducing disasters should be the top priority for everyone (Manyena 2012).

The idea of integrating development and disaster management is not new. Efforts like sustainable development or sustainable hazards mitigation have been advocated earlier. NGOs and international organizations (UN, World Bank, International Federation of Red Cross and Red Crescent Societies, Asian Disaster Reduction Center) have proposed numerous development goals (e.g., Millennium Development Goals, Hyogo Framework for Action, World Disaster Reduction Campaign), implemented various programs (e.g., United Nations International Strategy for Disaster Risk Reduction, ProVention Consortium, The International Strategy for Disaster Reduction), and published many reports (World Disasters Report, UNDP's Disaster and Development Report) that focus on integrating disaster and development. The United Nations carries out many developmental programs in developing nations which seeks to reduce disaster vulnerability through capacity building. Collins (2009) and Mileti (1999) have also published much work on disaster and development, yet, the focus seems to be limited only to sustainable development, which has both strengths and limitations (Afedzie and McEntire 2010; McEntire 2005, 2011). For instance, the sustainable development perspective focuses more on natural disasters and hazard mitigation, but ignores other types of disasters and phases of emergency management (Afedzie and McEntire 2010; McEntire 2005, 2011).

Thus, there is a need of a new kind of development that includes, but goes beyond poverty reduction, economic development, and sustainability. A policy that gives necessary considerations to disaster likelihood and reduces vulnerability to future disasters is required. There should be clear understanding of who is most vulnerable and how the interactions between nature and society shape the underlying factors that contribute to vulnerability (Thomalla et al. 2006). There is also a

need for management strategies that are capable of handling disaster simultaneously without interrupting development activities. Schilderman (1993) draws special attention to the discrepancy in the amount of aid spent on disaster and vulnerability reduction; he claims that too much is spent to deal with disaster impacts rather than reducing vulnerability (p. 422). Hence, in order to address disasters effectively, a long term solution is vital, which can only be achieved with a change in policy. For this to occur, community based businesses (CBOs), non-governmental organizations (NGOs), and international non-governmental organizations (INGOs) play an important role in challenging the assumptions underlying current relief and reconstruction work, and most importantly advocating for a more development oriented approach to disaster (Schilderman 1993). Furthermore, all emergency management stakeholders (citizens, local, state, federal bodies, private, public and nonprofit sectors) must have an active role in both formulating and implementing such policies.

2.9 Reversing the Social Construction of Disasters

Disasters have been studied from many approaches. For instance, Fordham (2007) discusses the natural hazards, disaster sociology, and vulnerability perspectives. The natural hazard paradigm is correct to concentrate on probable natural hazards. However, this perspective often ignores man-made hazards (technological, terrorism, HAZMAT) (Afedzie and McEntire 2010; McEntire 2005, McEntire et al. 2010). The disaster sociology approach, on the other hand, looks into disasters through organizational and collective behavior lenses (Fordham 2007). Its solitary focus on groups (group behavior and power structure) has often been a potential limitation as it may inadvertently overlook management needs and priorities.

Vulnerability is another perspective that is widely used in disaster studies. Scholars and practitioners have defined the concept of “vulnerability” in different ways (McEntire 2011, p. 295). Cutter (1996) defines vulnerability as “the likelihood that an individual or group will be exposed to and adversely affected by a hazard” (p. 532). Mustafa refers vulnerability as “a state of defenselessness which renders a community powerless to withstand the debilitating effects of events commonly perceived as disaster or natural hazards” (cited in McEntire 2011, p. 295). Kaspersen et al. (2001, p. 5) states that “vulnerability is a function of variability and distribution in physical and socio-economic systems and limited human capacity to cope with accumulating hazards and the socio-economic constraints that limits this capacity” (cited in Ibem 2011, p. 29). Other definitions relate vulnerability with potential for loss, risk, damage, stress, state of powerlessness, insecurity, and defenselessness.

Among the three approaches (natural hazards, disaster sociology, and vulnerability), it is the vulnerability perspective which is considered to be most appropriate to understand hazards and disasters due to its ability to explain physical, social, economic, cultural and political variables related to hazards (McEntire 2005, 2011). For example, Alexander (2006) claims that “vulnerability is greater determinant of

disaster risk than hazards themselves” (p. 2). Thomalla et al. (2006) believe that vulnerability is an outcome of complex social, economical and environmental interaction that affects the ability of individuals and communities to prepare for, cope with, and recover from, disasters (p. 43). Vulnerability has also been generally studied from sociological perspective where much focus is given to vulnerability to certain groups based on their physical and socio-economic state.

While this view of vulnerability is undoubtedly accurate, it might be somewhat incomplete. David McEntire has worked continuously on this topic for years, and he views vulnerability from the perspective of both liabilities and capabilities. McEntire et al. (2002) advocated a new disaster paradigm—comprehensive vulnerability management—and suggests that the recommendation provides a better understanding of disaster management than the previous disaster paradigms (e.g., comprehensive emergency management, sustainable hazard mitigation, disaster resilient communities, etc.). He argues that comprehensive vulnerability management incorporates all types of disaster agents (natural and manmade), all factors (physical, social, economical, cultural, and political), all stakeholders (private, public, nonprofit, citizens), all disciplines (sociology, geography, planning, political science engineering, psychology, etc.), and an emphasis on all phases of emergency management (mitigation, preparedness, response and recovery). McEntire (2011) refers to vulnerability as “a measure of proneness along with the ability to withstand or react to adverse consequences” (p. 298). According to him, vulnerability has two components—factors that determine proneness (liabilities) as well as other variables associated with the limited capacity (capabilities) (McEntire 2011).

2.10 Liabilities

The various factors that affect disaster vulnerability include physical, technological, social, economic, cultural, and political variables (McEntire 2011). Physical factors include human settlement patterns, building construction, enforcement of laws and regulations. Technological variables include the use of engineering and the impact of computers and other forms of technology both (positive and negative). The socio-economic factor is comprised of variables like social-status or class and ethnicity (Asian, American, Hispanic, etc.). Cultural factors may take account of nonmaterial components (e.g. beliefs, values, languages, family pattern, and networks) (Kulatunga 2010). Meanwhile, political factors focus on issues of power, authority, policies, political systems, leadership, coordination, and collaboration.

It is these and other factors that have a bearing on development and result in socially constructed disasters (Fordham 2007). For instance, prior demographic shifts over the past few decades indicate that the U.S. population has slowly moved towards the seismically active West Coast as well as vulnerable levees and coastal areas in the South (Perrow 2008). These decisions and activities increase

the proximity to hazards, making the population vulnerable. Human activities such as unplanned settlements, deforestation, encroachment of the forest-land for cultivation, and building construction are inducing disaster risk (Pokhrel et al. 2009). However, these patterns may be shifting, and can be reversed with other steps to deal with disasters in an effective manner.

2.11 Capacity

Vulnerability is also related capacity building activities in societies (McEntire 2011). Capacity building is defined as “the creation of an enabling environment with appropriate policy and legal frameworks, institutional development, including community participation, human resources development and strengthening of managerial system” (UNDP as cited in Haigh and Amaratunga 2009, p. 83). Capacity building can either focus on providing basic infrastructure facilities or may involve activities that foster development (Haigh and Amaratunga 2009). Formulating programs and policies is not enough; there should be adequate financial, human and organizational resources to make these efforts achievable. Many international organizations provide financial assistance to help poor nations in their developmental efforts. Nonetheless, these types of international aid and development programs are often criticized for creating “dependency syndrome” (Berke 1995). Hence the focus should be on emphasizing local capacity building and resolving long standing physical, social, economic and political problems, so that the communities can be self-reliant. In terms of disaster management, capacity building efforts must focus on a broad array of mitigation, preparedness, response and recovery activities (see Chap. 10 in this volume).

With these in mind, McEntire (2011) indicates four ways to reduce vulnerability: reducing risk, reducing susceptibility, increasing resistance, and increasing resilience. Reducing risk and susceptibility attempt to reduce liabilities. Meanwhile, increasing resistance and resilience are strategies to build capabilities (Fig. 2.1).

2.12 Reducing Risk

Risk reduction focuses on physical variables related to vulnerability—location of buildings in proximity to hazards. Disaster risk can be reduced by implementing policies that encourage safe building practices that move human settlements away from hazards (where possible). Likewise, enforcing standards and regulation (e.g., building codes, regulations on industrial emissions, land use regulations, etc.) and making regular inspection can significantly lower the risk to population as well as the environment (Perrow 2008; Seneviratne et al. 2010). Public education about hazards, vulnerability and disasters can increase awareness among citizen which may ultimately inhibit precarious human activities like deforestation, encroachment of forest land, violation of laws etc.

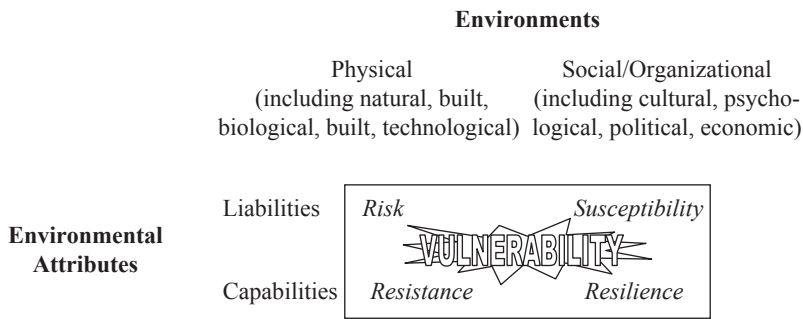


Fig. 2.1 Comprehensive vulnerability management. (McEntire 2001)

2.13 Reducing Susceptibility

Unlike risk reduction, the concept of susceptibility looks into social, economic, cultural, and political variables associated with vulnerability (McEntire 2011). Susceptibility also includes the vulnerability of different groups to hazards and disasters. Certain populations like minorities, poor, elderly, immigrants, women, disabled and children may sometimes be vulnerable to disasters as they may lack capabilities to deal with disasters for various reasons (Tobin 1999). Factors such as age and gender can increase vulnerability; the elderly, women and children sometimes have low physical capabilities to deal with disasters. Similarly, women are traditionally viewed as caretakers and spend much time at home, so they might have the additional responsibility of caring for children (in addition to themselves). Social factors like growing economic disparity and inequality in political power also raise the issue of vulnerability among certain groups (like poor and minorities), and act as an obstacle for development (Alexander 2006). Moreover, the World Bank estimates that 20% of the world’s poorest people have some kind of disability (World Bank cited in UN 2006), so policies that bridge the gap between rich and poor are not only desirable, but are a necessity to reduce vulnerability in other ways.

Similar to social and economic variables, cultural values and attitudes can act both as a promoter as well as an obstacle for reducing susceptibility (Kulatunga 2010). Culture provides guidance for individual survival; however, cultural elements also increase vulnerability to disasters. For example, some communities survived the Indian Ocean Tsunami due to their indigenous knowledge regarding Tsunami, but this was not always the case. The Jevanese communities living in Indonesia were subjected to a major threat when they neglected the evacuation order due to their attachment to traditional cultural beliefs. The habitual practice of culture may often result in negative consequences (Kulatunga 2010; Fordham 2007). For instance, the busy lifestyle in the west has resulted in fast-food culture, obesity and massive reliance on big-box stores. These changes and dependencies, along with the rising divorce rate, breakdown of the family and higher dropout rates, may ultimately make society more vulnerable to disaster (McEntire 2011). Thus, a change in culture is important to reduce the potential for disaster (Mileti 1999).

Political factors such as “stove piping” (communicating with others in their own organizations or within the same sector), lack of leadership, poor coordination and communication can also hinder disaster management activities (Kupucu et al. 2010; Phillips et al. 2012; Waugh and Streib 2006). Government lassitude or enthusiasm towards disaster can consequently affect policies and the amount of resources that go into disaster management programs. Similarly, the politicization of disaster events also affects disaster management activities as it diverts the focus from addressing the need of disaster victims to the assignment of blame. Hence addressing social, economic, cultural and political factors will be necessary to reduce vulnerability.

2.14 Increasing Resistance

Building resistance reduces vulnerability by focusing mainly on traditional hazard mitigation approaches. Resistance can be increased by adopting structural mitigation strategies (such as constructing levees, dams, elevating houses in flood prone areas) as well as non-structural mitigation strategies (like careful land use planning, building codes enforcement, and relocating communities where possible). Retrofitting buildings in seismic zones, making wildfire defensible spaces, constructing emergency shelters create an environment that can resist hazard and at the same time with stand harsh disasters. Technology can also play an important role in enhancing these types of mitigation techniques. With the use of new technologies, buildings can use base isolation and vibration damping products that absorb and control seismic motion during earthquakes. Hurricane clips and shutters to strengthen windows and doors further enable houses to be more resistant to high winds. Attention should also be given to eliminating development in hazardous areas, the enforcement of building codes, regular maintenance and building inspection activities. Developing a back-up system for computers can eliminate the threat of losing valuable data after disaster.

2.15 Increasing Resilience

Building resilience is another approach to reduce vulnerability. “Disaster resilience” is commonly referred as the ability to recover or bounce back to normalcy after a disaster (McEntire et al. 2002, p. 269). Nonetheless, many scholars (Berke 1995; McEntire et al. 2002) believe that the focus should be on moving the disaster struck community towards a more stable condition than pre-disaster state. The resilience perspective looks into disasters as anticipated events and emphasizes the act of planning to predict contingencies and reduce the initial shock (Blanke and McGrady 2012, p. 75). Creating hazard mitigation plans, planning evacuation routes, and providing drills and exercises provide emergency management officials

and the public guidance on steps to alleviate loss from future disaster. Similarly, allocating sufficient resources for emergency management activities and emphasizing coordination among all levels of government is crucial for increasing disaster resilience (McEntire 2011).

Resilience can also be increased by having pre-existing plans (hazard mitigation plans, emergency operation plans, and recovery plans). However just having a pre-existing plan does not guarantee the safety of the community, it is crucial for local officials to implement those plans, and improvise according to the situation. Particularly for private firms, creating a business continuity and disaster recovery plan (BCDRP) enables corporations to effectively cope with the disaster and at the same time helps to promptly resume normal operations (Blanke and McGrady 2012). For instance, the Volunteering Nursing Association (VNA) headquarter building in Texas was destroyed by fire; however, its business continuity and disaster recovery plan (BCDRP) helped the organization fully recover from the fire, without interruption of its service (Blanke and McGrady 2012). Likewise, the acquisition of grants and the implementation of policies are also crucial in managing disasters. The accessibility to grants and good policies enables disaster stricken community to rebound quickly, effectively and efficiently after disaster.

2.16 Implications

As can be seen, a proactive approach that focuses on future disasters (rather than presuming disasters are low probability events and retaining a reactive stance) should be adopted. Rising disasters indicate that emphasis should be on new and holistic form of development that reduces the potential for disaster and augments capacity (Collins 2009). Manyena (2012) provides an example of Ethiopia's Institutional and Support Project (ISP); the project made efforts to integrate development and disaster concerns by using risk reducing and capacity building strategies. The project adopted an early warning system which made information accessible to remote areas. However, the project lacked effective use of local knowledge and values so the impact was not as extensive as it could be (Manyena 2012).

Thus, it is true that the focus on any one of these approaches—reducing risk, reducing susceptibility, building resistance, and building resilience—can help to reduce vulnerability to some extent. Nevertheless, it is the combination of all four strategies that is essential to address disaster vulnerability in the long term. For example, locating a population further away from ocean shore may decrease the impact of tsunamis. Nonetheless, this action does not lower the need for policies relating to anthropogenic hazards (which may result due to unsafe human practices such as deforestation, failure to follow laws or safety protocols, incomplete planning or incorrect decision making). All of the strategies mentioned here (reducing risk, reducing susceptibility, increasing resistance, and increasing resilience) should thus be integrated together for successful disaster management activities (McEntire 2011).

Scholars and researchers have consistently highlighted the importance of incorporating broad disaster management principles during development activities. However, not enough is known about how the integration can be achieved. For instance, are there communities that are making strides in each area? Why are some jurisdictions and nations more successful than others? What can be done to move all countries and communities forward?

Regardless of our lack of knowledge, emphasis should be on an integration that will reduce vulnerability and that provide development opportunities. Bouwer et al. (2007) suggest that development through implementation of innovative financial mechanism (like catastrophe risk insurance and deficit rainfall insurance) can support disaster reduction. Schilderman (1993) recommends the use of local materials, community involvement and policy integration for disaster and development consolidation. O'Brien et al. (2006, p. 65) argue that long-term development actions can be threatened by environmental concerns, and hence the consensus and planning approaches that link development and disaster should extend in this area.

Of course, it should be recognized that programs that focus on disaster and development are bound to be impacted by various challenges such as political conflict, lack of resources, leadership failures, and coordination issues that create obstacles (Manyena 2012). For example, Harding (2007) posits that the political conflict between the Middle East and the United States has at times hindered developmental work in Iraq. In addition, most of the third world countries are incapable of integrating disaster and development programs due to lack of resources so they must rely heavily on international aid. In Ethiopia, nonprofit organizations did play a major role in initiating and supporting development projects aftermath of a disaster (Manyena 2012). Although this type of NGOs and INGOs' involvement is helpful for development, foreign aid may also result in dependency syndrome (Berke 1995). Hence, future research should focus on successful ways to merge disaster and development activities while also seeking to lower an over-reliance on foreign aid and outside resources.

Likewise, focus should also be given to risk and capability assessments, and applying research findings and technologies (monitoring tools) to enable practitioners to identify vulnerable populations (Collins 2009). For example, foreseeing the possible impact of an event can help the government to allocate resources more carefully which makes response and recovery activities more effective and less problematic. Steps should also be made to streamline the documentation of all types of disasters, and also to make more accurate prediction of environmental degradation and future disasters (Thomalla et al. 2006). Knowledge about the actual impact of climate change on disasters could help practitioners carry out necessary activities to reduce the severity of such events.

Practitioners, on the other hand, should incorporate valuable research findings in their professions. Being better able to determine the hazards and disasters that are specific to the community can help practitioners adopt disaster management activities that are required and realistic. Similarly, understanding best practices related to preparedness, training and exercises can provide practitioners with valuable knowledge that can be utilized in time of disasters. Furthermore, existing research

also makes participating organizations more aware about their weaknesses and strengths. The knowledge of local ordinances, federal/state regulations and recommendations on how to work in the political realm is also equally important for practitioners (Waugh and Tierney 2007). Studies likewise reveal that emergency managers should make efforts to bridge the gap between all levels of government (federal, state, and local) and all sectors (private, public, and non-profit), by creating bridges that promote mutual understanding, collaboration, and coordination. Schneider (2002) recommends numerous ways to link hazard mitigation with sustainable community development, all of which are also applicable in integrating development and emergency management systems. For instance, it is important to educate all public managers and planners about the relationship between disaster management and development. Emphasis should be on stressing the value of mitigating hazards during early phases of development. Similarly, policy makers should follow prior research findings to link emergency management systems and priorities with policies related to development. For example, policies on land use planning and transportation should be tied with disaster management activities. Since community based emergency management activities empower the public and enhance their sense of responsibility for disaster management activities (Kulatunga 2010), practitioners should also incorporate citizen inputs during formulation and implementation of various disaster policies and be receptive to people's suggestions and feedback. Likewise, research has revealed that practitioners should consider a vulnerable population as active resources instead of viewing as helpless victims (Berke 1995; Schilderman 1993).

Regardless of diversity of policy recommendations and methods for practical implementation, the integration of disaster and development activities should always consider all types of threats, all phases of emergency management, all variables relating to vulnerability, all actors involved in disasters, and all relevant disciplines (McEntire et al. 2002). Many disaster paradigms (eg. sustainable hazard mitigation, disaster-resistance community, and disaster-resilience community) focus more on natural hazards and ignore other types of threats (technological, civil, terrorist, biological). This should not be the case because most types of hazards can impact a community. Secondly, it is crucial to give attention to all phases of disaster cycle (mitigation, preparedness, response and recovery). Historically, the response phase seems to dominate disaster research and the agenda of practitioners (Phillips et al. 2012). Hence, researchers and practitioners should also consider other phases of emergency management while focusing on proactive, rather than reactive efforts.

It is also vital to take into account the various factors that affect the degree of vulnerability. Communities vary based on their demographics, social and cultural contexts, access to resources and political realities. A hazard that can be particularly deadly to one community might just be a minor event for another jurisdiction. Hence, all types of variables matter and efforts should therefore be made to identify and reduce the broad array of vulnerabilities.

Another consideration should be the involvement of all actors (private, public, nonprofit, public, government bodies and citizens) related to disasters and emergency management. Local officials, community planners and the general population

mistakenly assume that emergency management is not their responsibility or concern (Schneider 2002). Similarly, it is a myth that only some organizations (like fire department, police department, EMS) have active role in disaster response. Disaster management problems cannot be solved in isolation (Mileti and Gailus 2005), so it is important to change this kind of mindset. Effective management of disaster is only possible when all sectors, all levels of government and citizens support and contribute their efforts to address hazard and disaster vulnerabilities. This requires a shift in emergency management system (i.e. moving from a command and control system to a more network based system that fosters communication, collaboration and cooperation among all actors) (Kapucu et al. 2010; Waugh and Streib 2006).

Finally, disaster management is and should be multidisciplinary in nature; scholars and practitioners from numerous disciplines (engineering, public administration, geography, climatology, sociology, psychology, economics, city planning, information technology, political science, and anthropology, etc.) must contribute their knowledge and provide valuable insights on disaster management (Phillips et al. 2012). Disaster and development studies must be approached from different perspectives such as public health, environmental management, physical/geography, urban planning, social and behavioral studies, emergency management (Collins 2009). Nonetheless, a holistic understanding of the relationship between disaster and development can only be achieved if it follows an interdisciplinary perspective that moves beyond individual fields of interest.

Hence, there is a need for a new policy that concentrates on reversing the social construction of disasters by assessing all types of liabilities, assessing all types of capabilities, and then closing the gap between the two. A holistic policy that encourages collaboration across hazards, variables, phases, actors and disciplines should be the top priority. Since it is important for researchers and practitioners to view disasters and emergencies from a holistic perspective, the concept of “comprehensive vulnerability management” may prove advantageous.

2.17 Conclusion

Disasters are increasing worldwide and their impact on society is also escalating to new heights. Among the various consequences of disaster, its impact on development is noticeable. Disaster and development are clearly related. Poor development can intensify vulnerability and cause devastating impact, but at the same time wise development practices may reduce vulnerability. Disasters also hinder developmental works, but can concurrently provide development opportunities as well. Hence, there is a need for a new kind of development that reverses the social construction of disaster, and fosters the positive aspects of the “disaster and development” relationship.

Likewise, consideration should also be on reducing all types of vulnerabilities while simultaneously enhancing a broad range of emergency management capabilities. For this to occur, future research should focus on ways to reduce risk and susceptibility, and at the same time find ways to increase resistance and resilience. Concurrently, practitioners should also play an important role for overcoming the

challenges associated with integrating disaster and development by focusing on policies that address all hazards, disaster variables, emergency management phases, disaster participants and academic disciplines. By taking a more aggressive and holistic approach we will be better able to reverse the rising trend of disasters.

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