

# Chapter 3

## Key Concepts, Definitions, and Perspectives

### Objectives

*Upon completing this chapter, readers should be able to:*

- Have a general ability to define disaster.
- Distinguish among emergency, disaster, and catastrophe.
- Understand the importance of the National Governor's Association Report and the contributions it made to the profession.
- Identify the different research traditions in emergency management and be able to distinguish between them.
- Use the main theories often used to describe and explain human behavior in disaster.
- Comprehend current theoretical issues and debates in the field, including the views of professionals and researchers.
- Appreciate the value of a multidisciplinary approach for the practice of emergency management.

## Key Terms

- All hazards approach
- Catastrophe
- Comprehensive emergency management
- Crisis
- Disaster
- Emergency
- Emergent norm theory
- Hazard
- Life cycle of disasters (or the four phases)
- Risk
- Sociopolitical ecology theory
- Systems theory
- Theory
- Vulnerability

## 3.1 Introduction

This chapter will help the reader understand the different definitions of disaster within the field of emergency management. Quarantelli and Dynes (1970) suggest that the word disaster is a “sponge concept,” since it soaks up many different meanings. For example, in general conversations, people may refer a traffic ticket, missed appointment, or broken leg as a disaster. Within the context of emergency management, the word disaster may mean the disaster agent (e.g., tornado, flood, and hurricane), the damage and the loss of life caused by the agent, the social definition of the event (e.g., moderate versus very bad) by the various parties involved, or the social disruption generated by the event (Dynes 1974). This chapter will help you understand the concept of disaster, and related terms, in all of its complexity.

Perspective matters. For example, an EF 2 tornado through a suburban neighborhood may be a disaster in the eyes of the victims, but not according to existing government policies that require certain levels of devastation before help can be approved. First responders (police, fire, and ambulance services) will rush to emergencies (traffic accidents and fires). Emergency managers typically organize their efforts around larger events that cause community disruption. To do so, both practitioners and researchers draw upon the “four phases” or the “disaster cycle” (i.e., preparedness, response, recovery, and mitigation) to think about how to manage major events.

And, disasters may not be exclusively natural, technological, or terrorist events. Local leaders may draw upon emergency managers’ crisis skills for broader nontraditional events. Such situations include helping to count votes for President, recovering debris from a space shuttle accident, assisting after a riot, or dealing with a pandemic. These broad and wide notions of disaster, which necessarily involve multiple academic disciplines and professions, serve as the foundation for the profession of emergency management and college degree programs. This chapter should help you understand an array of terms such as disaster, provide help when you use the word, and guidance when you become a practitioner.

## 3.2 Defining Disaster

As we have already seen above and will see further evidence below, people attach a number of different meanings to the word *disaster*. Even those of us who study disaster have different meanings and views on the topic. However, for the purposes of this text, we will draw upon a definition that has guided most researchers. Then, we will explain why we want you to think about disasters on a continuum ranging from emergency, to disaster, to catastrophe. We will deal with some of the other different meanings of the word disaster later in this chapter. Noted scholar Charles Fritz (1961, p. 655) defined disasters as

... actual or threatened accidental or uncontrollable events that are concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of society undergoes severe danger, and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society, or its subdivision, is prevented.

Notice the main components of this definition. First of all, disasters are social events—unless the event impacts people, it is not a disaster. For example, if a tidal wave totally covered an island not inhabited by people, then the event would not be considered a disaster. Second, the situation must cause social disruption for a specific group of people. For example, if a tornado destroys part of a town of 50,000, life may not change much for those not directly affected. Most actions then focus upon responding to and recovering from the disaster. For an event to be a disaster, significant disruption must occur. For example, businesses, schools, hospitals, and government offices may be closed from the damage.

Third, the area and people impacted will likely need to obtain help from the outside. External help may include search and rescue teams for victims and medical needs, companies with bulldozers and chain saws to assist with clearing debris, or utility specialists to fix power lines. Volunteers and volunteer organizations will also bring in food and water for survivors as well as those assisting with search and rescue, debris removal, and other actions. Another important issue within Fritz's definition is considering that the *situation* may not be an actual physical event, but rather the perception that an event could or is taking place. For example, thousands of people may be evacuated when a hurricane warning is issued. Such an event disrupts the lives of the residents, local, and state government officials, businesses and volunteer organizations. All of these individuals' lives change to varying degrees—even if the hurricane does not strike. But, at least they get to return and resume their day-to-day lives. In short, Fritz's definition suggests that life as we know it dramatically changes when disaster strikes. Next, let's look at the differences among emergencies, disasters, and catastrophes.

### 3.2.1 A Continuum of Disaster

People may think of an event in simple terms—either something is or is not a disaster. A car wreck is not a disaster. A tornado is a disaster. A house fire is not a disaster. A tornado or large chemical accident is a disaster. Yet, whether an event can be defined as a disaster is not a black and white delineation (Fischer 2003). Rather, think how events occur along a continuum where some events occur as day-to-day emergencies, others as disasters (with some larger than others), and on rare occasions, become catastrophes (See Figure 3.1). In the following sections, we distinguish between the concepts of emergency, disaster, and catastrophe.

#### 3.2.1.1 Emergency

Emergencies are part of everyday life in a community. Emergency response situations may include heart attacks, house fires, or car accidents. Emergency response organizations can generally anticipate their emergency response needs on a yearly basis. For example, in the United States, Independence Day (July 4) and the New Year (December 31 and January 1) are the busiest times of the year for firefighters. The annual July 4 peak in the United States is a result of fireworks and, to a lesser degree, outside grilling. Fires around the New Year also involve firecrackers and flammable Christmas trees (U.S. Fire Administration 2004). Anybody in the medical field knows that weekends generally are busier than weekdays for emergency response organizations. Since these emergency response patterns are predictable, governments and response units can plan accordingly and manage these situations. In addition, except for those primarily directly involved in the emergency, life goes on for everybody else.

Situations do arise where some outside help may be needed. For example, in the case of a large apartment fire, responding fire departments may

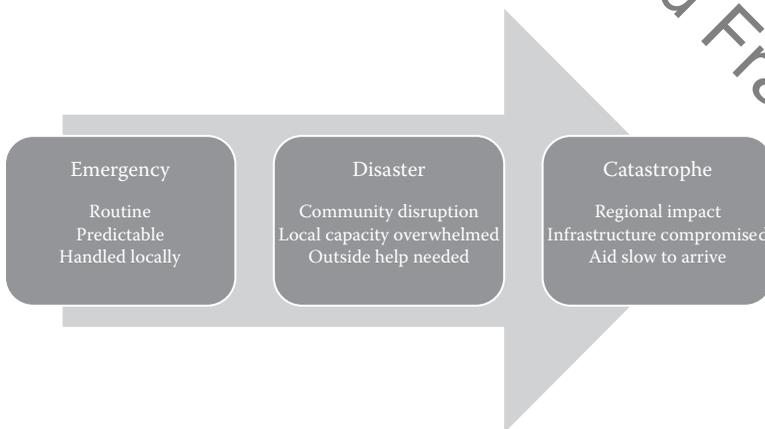


FIGURE 3.1 A continuum of disaster.

activate a Memorandum of Understanding (MOU) with nearby fire departments. When a major event occurs, the neighboring fire department will arrive to either aid with the large fire or provide backup if another fire occurs within the city. Thus, although resources may be stretched, local communities can carry on business as usual when the emergency occurs.

### **3.2.1.2 Disaster**

Drawing upon Fritz's (1961) definition noted above, a disaster breaks the local community's ability to respond to an event, even when outside help is drawn upon. For example, response organizations such as fire and police may not be able to respond to all the immediate needs or not able to respond at all. The number of immediate victims may outnumber the availability of emergency response officials. Debris and damage may inhibit emergency responders from quickly entering the disaster site. In addition, the emergency responders may be victims also. But a disaster is much more than the inability of emergency responders to do their duty. The infrastructure may suffer major damage. Most of the community may not have electrical power. Water (including drinking water and sewage) may not be available. Highways and bridges may either be impassable from excessive debris (e.g., from a tornado), inaccessible (e.g., flooded), or destroyed (e.g., earthquake). Family members may be separated from each other, have no food or water, or find their homes may be gone. Businesses, schools, and other organizations will close since the buildings will be damaged or destroyed, and people cannot travel to these locations. In short, everyday life as we know it ceases. Priorities change to focus on the event at hand. The community cannot fend for itself and needs outside help.

### **3.2.1.3 Catastrophe**

Catastrophes are much more than just "larger disasters." Following Hurricane Katrina, Quarantelli (2006) noted that the hurricane's social impact and aftermath included the basic characteristics that distinguish a catastrophe from a disaster. First, in a catastrophe the disaster agent impacts or destroys almost all of an area's buildings and infrastructure. With Hurricane Katrina, over 80% of New Orleans flooded, and much of the area along the Mississippi coast experienced extensive storm surge damage. The floodwaters and wind either directly or indirectly made most of the infrastructure (e.g., electricity, drinking water and sewage, and transportation) inoperable. Police, fire, and other local and even regional emergency response organizations were generally unable to operate since the hurricane's aftermath impacted their buildings and staff. Furthermore, outside assistance organizations (federal, state, volunteer organizations) had difficulty initially helping. Cell phones did not work for most carriers for nearly a week. Transportation was difficult if not impossible into the area. When help did arrive, personnel had

trouble finding facilities to use. The sheer magnitude of the event made it difficult to know where to begin.

Second, many local officials could not tend to their jobs after Katrina, even into the initial recovery period. In many cases, these individuals had no place to go to work and/or had lost their homes. This issue also became evident following the Indian Ocean Tsunami in 2004 and the Haitian Earthquake in 2010. With thousands dead, including government officials in some places, response activities became difficult if not impossible to coordinate.

Third, during and following a disaster, help generally arrives rather quickly. In fact, a problem following a disaster is that too much help (e.g., people, food, and supplies) arrives, a problem known as “convergence.” However, with the massive nature of a catastrophe, help may be slow in coming. Specifically, large cities may not be able to help nearby smaller cities, and nearby smaller cities cannot help larger cities since the entire region has been impacted. People, food, and other needed supplies initially have no place to go to provide assistance (Quarantelli 2006).

Fourth, catastrophes mean that daily routines of individuals, families, organizations, governments, businesses, schools, and other sites will experience significant disruptions. Consider again the case of hurricane Katrina, with little if any functioning infrastructure, heavily damaged buildings, over one million residents displaced—the routine of life along the Gulf Coast came to a halt. Reflect also on the 2010 Haiti earthquake, where in addition to massive destruction of buildings and infrastructure, approximately 300,000 people died—many of whom carried out important day-to-day tasks for government, businesses, and households (Quarantelli 2006).

Finally, the role of politics emerges as a crucial aspect in the process of managing an event. During a disaster, local and state governments serve as the primary decision makers with the federal government providing some financial aid and resources. During a catastrophe, the federal government’s role moves to center stage since it has the resources to provide direct assistance to the impacted region. Following the earthquake in Haiti, issues about who was in charge surfaced quickly. The death of some politicians and possible lack of leadership in other areas created a major political vacuum. In addition, catastrophes such as hurricane Katrina cross local, county (or in this case Parish) and state jurisdictions, so the federal government can help serve under-resourced areas (Quarantelli 2006).

In short, a catastrophe varies significantly from a disaster. The disaster agent destroys most if not all of a region’s buildings and infrastructure. The lives of individuals and routines of whole communities become totally disrupted. Outside helpers have difficulty in arriving and even setting up operations. Local, state and the federal government must all become increasingly involved to deal with the massive problems generated by a catastrophe.

Now that we have a general understanding of the conceptual continuum from emergency to disaster to catastrophe, we will next discuss some concepts used by both professionals and researchers when trying to understand how emergency managers organize their daily activities to manage disasters.

### 3.3 The Politics of Disasters

Politics certainly play a role in whether an event is defined a disaster. Political definitions become important in the United States, since the amount and type of aid during and following the event is contingent upon how the event is defined (e.g., hurricane, flood, and landslide) and whether the event becomes a Presidentially declared disaster (PDD).

Through the last few decades, FEMA has established a process and general criteria for a Presidential Declaration of Disaster. Authority for such a declaration comes from a number of related sources. In a general sense, article 2 and section 3 of the U.S. Constitution implicitly gives the President the power to take emergency action to ensure that all laws are followed, and to command the use of the military (as Commander in Chief). The Disaster Relief Act of 1950 and the Disaster Relief Act of 1974 gave the President power to provide relief and assistance to disaster victims. Finally, the Robert T. Stafford Disaster Relief and Emergency Assistance Act (i.e., The Stafford Act; first passed in 1988 and later amended) gave the President further power to declare a disaster more quickly (such as in the case of a terrorist attack). In essence today, with a Presidential Declaration, the federal government through the Executive (i.e., Presidential) branch can provide immediate funds. Through the years, Congress has amended the Stafford Act, including the process and general criteria for the declaration of a disaster (FEMA 2015a; Sylves 2008).

FEMA does not have a set of numerical factors for determining whether an event is a disaster. For example, an event might be declared a disaster if nobody dies, or an event might not be declared a disaster if 150 people die. To illustrate, a slow moving flood may not kill anyone, but it could be declared a disaster. And, cases certainly exist in which a plane crash kills over 100 people, but the President does not declare a disaster. Rather, for an event to qualify for a disaster declaration, FEMA focuses upon the severity, magnitude and impact of the event among other factors. To understand the severity, magnitude and impact of an event, FEMA draws upon the criteria listed below as guidelines for a state's governor to use in making a request for a federal disaster declaration (FEMA 2010c, *verbatim*):

- Amount and type of damage (number of homes destroyed or with major damage)
- Impact on the infrastructure of affected areas or critical facilities

- Imminent threats to public health and safety
- Impacts to essential government services and functions
- Unique capability of the federal Government
- Dispersion or concentration of damage
- Level of insurance coverage in place for homeowners and public facilities.
- Assistance available from other sources (federal, state, local, voluntary organizations)
- State and local resource commitments from previous, undeclared events, and
- Frequency of disaster events over a recent time period.

The Stafford Act also spells out the process local and state governments must follow to apply for a declaration and receive federal resources. Drawing upon the criteria noted above, local and state officials will provide the state's governor with a damage assessment. The state's governor will then submit a formal request to its FEMA regional office (one of ten in the United States). The governor's request should demonstrate that state and local governments do not have the resources to manage and recover from the event. Both the regional and national FEMA offices will assess the report, and then make a recommendation to the President, who will accept or reject FEMA's recommendation (FEMA 2010c). Keep in mind that the process and criteria of a PDD can change and may be different at the time of your reading. A look at FEMA's website ([www.fema.gov](http://www.fema.gov)) can help you determine what if any changes have been made since the time of this writing.

Politics can and at times do enter into the Presidential declaration. During the last few decades, we can certainly argue that we have seen more disasters over the last few decades (Cutter et al. 2015; Mileti 1999; Quarantelli 1986). Additionally, as we have seen that the number of disasters increase, the amount of money spent on federally declared disasters has increased as well.

In a specific analysis on Presidential disaster declarations between May 1953, and January 2007, a distinct pattern emerged (Sylves 2008). First, during this time period, there were 1,674 major disaster declarations. This represents an average of 31 declarations a year or close to 2.5 declarations a month. However, if we look at the time period from January 1993 through September 2005, we see a dramatic rise in disaster declarations. The average increased to 48.2 declarations a year or four a month, with the increase believed to be tied to:

- The public's belief that the federal government's role is to provide aid
- Various politicians' views and use of federalism (or how the state and federal governments interact with each other)
- Presidents being more willing to declare disasters
- Laws allowing more aid to disaster hit communities and victims (Sylves 2008, p. 84)

Interestingly, partisanship does not seem to be part of the political process of major disaster declarations. For example, a request by a Republican governor to a Democratic President will not diminish the chance of an event being declared a disaster. Or, a request by a Republican governor to a Republican President will not enhance the chance of an event being declared a disaster. However, during the same 45-year-time period mentioned earlier, researchers also found that Democratic Presidents accepted a higher proportion of declaration requests than Republican Presidents. In addition, Presidents were more likely to approve a governor's request for natural rather than a technological disasters (Sylves and Buzas 2007). The pace of a disaster may influence a decision as well, for example, when an EF5 tornado devastates an area a Presidential declaration typically occurs more quickly than a slowly developing drought.

### 3.3.1 Slow- versus Fast-Moving Views of Disaster

Generally we think of disasters as events that quickly strike a population such as an explosion, flood, earthquake, tornado, or similar event. The perspective of looking at sudden or quickly moving events is in part based upon the research and professional roots of the field. Remember that dealing with nuclear and chemical war at the start of the Cold War drove much of our view of emergency management in the United States. To study human behavior in this context, researchers looked at human behavior during sudden or quickly occurring disasters like explosions or tornadoes. Even today, much of our knowledge of disaster behavior, especially in developed nations such as the United States, Canada, Japan, and Western Europe focuses upon the sudden, quick event.

However, not all events occur quickly, suddenly, or without warning. They develop slowly. Long term, slowly changing weather patterns can also create disasters. For example, meteorologists can often predict long-term patterns of drought in Central Africa. Drought can cause crop failure, leading to famine in these countries. In turn, famine often forces large numbers of people to migrate to other areas or even to other countries for survival. Mass migrations then may create civil wars or wars between nations. Human rights violations often occur to those who have fled devastated lands. These patterns are predictable and to a degree can be mitigated (Hoffman and Oliver-Smith 2002).

Environmental disasters can also be slow moving. The neighborhood of Love Canal, part of Niagara Falls, New York, became contaminated due to hazardous waste buried there by Hooker Chemical Company. When Hooker Chemical Company acquired area property in 1942, it started dumping chemical waste. During the early and mid-1950s, the property was sold to a developer to build homes. A school soon followed. By the mid

to late 1970s, residents started to notice odd odors and health problems including a higher rate of miscarriages, mental problems, and illnesses. A local newspaper tested the water in the area and found high amounts of hazardous materials. As a result, the local residents formed a protest group in order to help the residents with solving their medical issues, selling their homes, and closing the neighborhood. Overall, as part of an Environmental Protection Agency (EPA) program, over 800 families left the neighborhood with most of the homes then being demolished (Blum 2008; Levine 1982).

In this circumstance, the real issue is “when did the disaster start?” For some, it started the second the hazardous waste was improperly disposed of. For others, it began when the property was sold for development. Perhaps for the residents the event became defined as a disaster when people started to get sick or when residents and others claimed that the hazardous materials were causing the illnesses. By the late 1970s and early 1980s, federal and state government recognized the event as a disaster. Federal assistance and the EPA became involved as people moved out of the area to safer locations. As a slow and long-onset event, it was hard to pinpoint the exact time when the “threshold” was met to call the event a disaster (Blum 2008; Levine 1982).

In short, various types of disasters (e.g., droughts, famines, and hazardous chemicals) do not become immediate disasters. Rather, their impacts, consequences, and even public definition of the event becoming a disaster may occur over years and decades. As a result, emergency managers and others cannot state an exact time when such an event becomes a disaster. These types of events slowly creep upon us, until, perhaps the attributes of disaster suddenly exist, and it becomes too late to mitigate, prepare, or even respond properly. Regardless, it is the job of the emergency manager to take on such challenges, which historically has been characterized as a life cycle of activities organized into four phases.

### **3.4 The National Governor’s Association Report in the United States**

For decades, the United States struggled with disasters. The nation had no clear or central vision on how to handle disasters. Consequently, two important steps occurred that continue to impact emergency management today. First, President Carter established FEMA in 1979 to centralize and streamline emergency management responsibilities. During the same time, the National Governor’s Association (1979) issued a major report on how to improve emergency management. Almost 40 years since it was published, ideas from this report continue to drive and define emergency management

and provide important tools for disaster researchers. These concepts, outlined below, are embedded within the idea of Comprehensive emergency management (CEM) and an “all hazards” approach to disaster that span four phases of emergency management.

CEM encourages a broad holistic approach to managing disasters. First advocated by the National Governor’s Association (NGA) report on emergency management, CEM is defined as

... a state’s responsibility and capability for managing all types of emergencies and disasters by coordinating the actions of numerous agencies. The ‘comprehensive’ aspect of CEM includes all four phases of disaster or emergency activity: mitigation, preparedness, response, and recovery. It applies to all risks, attack, man-made, and natural, in a federal-state-local partnership. (NGA 1979, p. 11)

The four phases and all hazards approach to disasters continue to serve as the foundation for emergency managers and as important concepts for disaster researchers. We review these two concepts below.

### 3.4.1 The Disaster Life Cycle

Through the years, researchers and professionals have tried to break the disaster process down into specific categories even beyond the four phases commonly used today. Some have suggested using the terms preimpact, impact, and postimpact. However, the NGA (1979) report of four phases (mitigation, preparedness, response, and recovery) have stayed in place for a long time. Other nations have adopted the same idea. For example, in New Zealand they are known as the four “Rs”: readiness, response, recovery, and reduction. Regardless which organization or nation takes on the tasks of emergency management, these four general phases capture the bulk of what typical emergency managers do:

- *Mitigation*: “activities that actually eliminate or reduce the probability of occurrence of a disaster, arms build-up, land-use management, establishing CEM (i.e., comprehensive emergency management) programs, building safety codes” (NGA 1979, p. 13).
- *Preparedness*: “activities [that] are necessary to the extent that mitigation measures have not, or cannot, prevent disasters ... develop plans, mounting training exercises, installing warning systems, stockpiling food and medical supplies, mobilizing emergency personnel” (NGA 1979, p. 13).
- *Response*: “activities [that] follow an emergency or disaster. Generally, they are designed to provide emergency assistance for casualties ... seek to reduce the probability of secondary damage ... and to speed recovery operations” (NGA 1979, pp. 13–14).

- *Recovery*: “activities [that] continue until all systems return to normal or better. Short-term recovery activities return vital life-support systems to minimum operating standards. Long-term recovery activities . . . return life to normal or improved levels” (NGA 1979, p. 14).

Both professional emergency managers and researchers have found these categories useful for their work. For professionals, the phases give a unique way to divide their tasks and focus on their work. For example, in many state emergency management agencies and in large cities, offices often have specific sections or jobs related to some of the four phases. Historically, FEMA has had divisions organized around the phases although FEMA’s organizational structure today has become even more complex (see Figure 1.3 in Chapter 1). FEMA also provides federal grants related to these categories. As a result, states and local communities can secure funds for preparedness, response, recovery or mitigation activities.

Following the terrorist attacks of 9/11, FEMA and DHS integrated another concept to the life cycle of disasters—prevention. By design, the notion of prevention focuses upon a law enforcement approach to avoid, prevent or even stop a terrorist attack. These actions can occur through the following means (*verbatim*):

- *Intelligence and Information Sharing*. Planning and Direction: Establish the intelligence and information requirements of the consumer.
- *Screening, Search and Detection*. Locate persons and networks associated with imminent terrorist threats.
- *Interdiction and Disruption*. Disrupt terrorist financing or prevent other material support from reaching its target.
- *Forensics and Attribution*. Preserve the crime scene and conduct site exploitation for intelligence collection.
- *Planning*. Initiate a time-sensitive, flexible planning process that builds on existing plans and incorporates real-time intelligence.
- *Public Information and Warning*. Refine and consider options to release preevent information publicly, and take action accordingly.
- *Operational Coordination*. Define and communicate clear roles and responsibilities relative to courses of action (FEMA 2015b).

Although popular among those engaged in anti-terrorism activities, many in the emergency management profession still primarily use the concepts of preparedness, response, recovery, and mitigation. Academic degree programs in disasters and textbooks (including this) draw upon the four phases of emergency management as a way to organize degree programs and courses (Neal 2000). Researchers also use these concepts to categorize the type of studies they do. For example, overviews of research (Drabek 1986; Mileti,

Drabek, and Haas 1975) show that response is the most popular category to study with far less work conducted on recovery (Mileti 1999).

In short, the life cycle or phases approach helps emergency managers to organize their activities although they do overlap to some degree. For example, the removal of disaster debris from roads (response) may still be occurring while people are returning home (recovery). Or, following a flood, people may be rebuilding their homes (recovery) while government officials are building levees to lessen the impact of another flood (mitigation). In addition, certain activities may be hard to distinguish between phases. For example, public education programs for disaster warnings help people know what to do when the alarm is sounded. Yet, the same public education program could be considered mitigation since it can lower the loss of life and injury (Neal 1997).

Rather than occur as discrete sets of phases, the activities may actually occur concurrently or support other activities. Improved preparedness could increase the levels of response when disasters occur. With an effective response, recovery should become easier. Recovery also provides an opportunity, and higher levels of interest, to mitigate disasters. For example, having stricter building codes for earthquakes (i.e., mitigation) means generally that less damage will occur during an earthquake. As a result, less time and money will be needed to repair buildings or the infrastructure (i.e., recovery). In short, all the phases have an important impact on the other phases (Neal 1997).

### 3.4.2 The Expansion of Emergency Management

Traditionally, emergency managers deal with events such as tornadoes, floods, hurricanes, explosions, and similar events. However, over the last decade or two, those in emergency management have played central roles in events that we often do not think of as disasters. For example, city officials may open the Emergency operations center (EOC) to observe or coordinate activities involving large crowds such as athletic contests, spontaneous outbursts, social protests, and even riots. The EOC is an ideal place to gather information, house decision makers, and coordinate activities. These events and their outcomes involve all facets of local government, including police, fire, paramedics, and public works. Local governments have to organize their activities with businesses, volunteer organizations, and perhaps with some components of state and local government.

When the space shuttle Columbia disintegrated upon reentry on February 1, 2003, emergency management offices played a central role with a number of tasks. Experts determined that a thorough search of an area 240 miles long and 10 miles wide needed to be searched for debris and remains. But this search was not simple, as it involved looking for a wide range of materials including human remains, hazardous materials, and debris. FEMA coordinated the activities among many different organizations including NASA, the U.S. Forest

Service, and the EPA. As the search needs expanded, with hazardous materials being a main concern, the U.S. Coast Guard, the Gulf Strike Team, and a private contracting firm tested for contaminants in the water and atmosphere (none was found). Also included for other reasons in the recovery process included the FBI, the National Guard, search and rescue organizations, and the Texas Department of Public Safety. By February 4th, more organizations became involved, including those from Texas, Louisiana, Oklahoma, and New Mexico (FEMA 2003). Thus, FEMA, state and local emergency management offices played roles in managing (FEMA 2003):

- Over 82,500 pieces of the shuttle.
- A search area over 2.28 million acres.
- Tests across 23 square miles of water for contamination.
- Coordination of over 16,500 people, 130 governmental agencies, and 270 organizations involved in the search.
- Reimbursement of states for costs estimated at about \$10 million.

Two other recent cases highlight how emergency managers assist with crises events. In 2014, an Ebola virus scare occurred in the United States. As an exposed victim from Africa and other exposed health-care workers were discovered, EOCs opened in Dallas, Texas and Akron, Ohio. With the Akron case, not only did the local jurisdiction open the EOC, but the local county health office also activated an EOC. These EOCs served as important points of contact between health and emergency management officials, along with politicians and other important decision makers. During the Ebola crisis in the Akron area, the EOCs stayed open for 4 days and the Summit County Department of Health stayed open for 18 days (Schwartz et al. 2015).

In summary, emergency managers can play integral roles in different or extraordinary disasters. A primary daily role of the emergency manager is to help develop connections among people and organizations that may be useful in any type of disaster. So, whether it is an occasional event like a crowd of 40–100,000 people, or a rare event such as a space shuttle accident, emergency managers have many of the resources and the social connections to help coordinate materials and communications among the relevant players. To do so, they rely on an approach that spans a wide array of disasters.

### 3.4.3 All Hazards Approach

A second idea central to emergency management is what was initially called the “all risks” approach, and is today known as the “all hazards” approach. The National Governor’s Report showed that regardless of the event, certain governmental activities have stayed the same across events. Two important points should be mentioned, however, with the all hazards approach. First, hazards must be approached across the four phases of emergency

management. Too often, the report noted, people would focus on just “planning” while ignoring the other phases (NGA 1979). Hazards, risks, and disasters must be managed across all four phases and must involve coordination with local, state, and federal government, the public sector, the private sector, volunteers, and others (IAEM 2007).

During the same time researchers also advocated an all hazards approach to disasters, using the phrase “agent generic.” Although specific hazards may create specific problems or issues, overall similar issues will arise across disasters. During disasters, communication problems, and organizational coordination issues always arise. Similarly, the process of educating and warning the public follows the same processes across various types of disasters. Or, those more vulnerable to disasters (e.g., the poor, racial and ethnic minorities, women, the elderly, and people with disabilities) are more likely to be affected and require more extensive assistance. In short, the overall similarities of how we respond to disasters are much greater than the differences (Dynes 1974; Quarantelli 1982).

### 3.5 The Body of Knowledge

As noted earlier, people use the word disaster broadly. In the profession of emergency management, we often draw upon different perspectives to understand hazards, disasters, and risk. Each word represents certain components of emergency management while also reflecting different but important research traditions. We review these differences next.

#### 3.5.1 The Hazard Tradition

In the simplest form, hazards are disasters waiting to happen. People may live, work, or play in the path of floods, tornadoes, hurricanes, or chemical accidents. Simply put, hazards occur when people, nature, and technology interact (Cutter 2001). Mitigation serves as the main step taken by emergency managers to reduce the potential effects of hazards.

Geographer Gilbert White is considered by many to be the father of hazard mitigation. During his long and distinguished career he focused on the value of structural mitigation projects (e.g., levees and dams) that decrease flooding along rivers. Under White’s leadership, the Natural Hazards Research and Application Information Center (also known as the Natural Hazards Center) formed at the University of Colorado-Boulder in the mid-1970s (Natural Hazards Center n.d.).

White’s work with his colleagues helped to define the hazards perspective that has evolved into a multidisciplinary approach. Geographers, along with psychologists, sociologists, economists, engineers, and geologists now work together on research and practical applications to mitigate hazards. As part

of his legacy, the Natural Hazards Center also has a large resource center, and hosts an annual workshop for professionals, researchers, and others interested in the field of hazards (Myers 1993, visit [www.colorado.edu/hazards](http://www.colorado.edu/hazards)).

As part of the disaster planning process today, emergency managers undertake a “hazard analysis.” Typically, they determine the most likely events that could impact their community then work with area stakeholders (businesses, community leaders, residents, schools) to identify and prioritize hazard mitigation projects. Mitigation planning thus involves people to address the potential impacts a hazard may have and foster a more resilient result. Areas subject to flooding may prioritize dams and levees. Tornado alley locations may seek funding for safe rooms. The point is to focus on the hazard and find ways to reduce its human impact.

### 3.5.2 The Disaster Tradition

The disaster tradition is grounded in disaster preparedness and especially disaster response activities. Much of this goes back to civil defense activities during the start of the Cold War between the United States and the Soviet Union (from the late 1940s until the fall of the Berlin Wall in November, 1989). During the Cold War, each country prepared to respond to potential nuclear strikes. The United States military provided research funding to the University of Chicago in an effort to see how soldiers and civilians would respond to nuclear war or chemical weapons. The National Opinion Research Center (NORC) at the University of Chicago, led by Charles Fritz, initiated much of this research. Obviously researchers could not expose cities and people to nuclear bombs or chemical weapons. So researchers selected to study events similar to war, that is, disasters. To do so, researchers traveled to disaster sites soon after impact and studied how people and organizations responded. Contrary to popular belief, researchers found that disasters did not cause behaviors such as mass panic, looting, or hysteria. Rather, disasters brought out the best of behaviors—altruism abounded (Quarantelli 1987, 1994).

Drawing upon the “quick response” research of the NORC studies, sociologists Henry Quarantelli, Russell Dynes, and Eugene Haas formed the Disaster Research Center (DRC) in 1963 at The Ohio State University. Dynes and Haas both specialized in organizations, and Quarantelli had been a graduate student at the University of Chicago during the 1950s where he served as a research assistant with NORC. Like NORC, much of DRC’s initial funding came from the Department of Defense and focused upon the social aspects to disaster response. DRC’s earliest research focused on organizational response to disaster.

Today, DRC (now located at the University of Delaware) continues to be a leading international research center studying a wide range of events and topics. Since the center started in 1963, it has studied over 600 events not only

in the United States but throughout the world also (e.g., 1964 Alaska earthquake; 1974 Super Outbreak of Tornadoes; 1989 Loma Prieta Earthquake; 2001 Terrorist Attacks; and 2004 Indian Ocean Tsunami). In addition to what could be considered more traditional issues related to disaster research, DRC has focused on new, innovative research topics including handling the dead, sheltering and housing, mental health delivery systems, emergent citizen groups, organizational improvisation, hospitals and medical delivery, and crowds and riots. At the time of publication, DRC has research teams studying the issue of risk during and after the recent Ebola crisis, stakeholder decision in creating disaster policies, resiliency after Hurricane Sandy in New York City, and other projects (DRC 2015, 2016).

DRC has also made a major contribution by training a large number of graduate students. These former graduate students have gone on to further quick response research, provide a clearer understanding of disaster response, and contribute to disaster research. DRC alumni have also helped to design and develop academic programs related to disaster management. More broadly, DRC established a research model over 50 years ago, and today disaster and hazard centers use that model throughout the world. DRC also has the most comprehensive disaster library collection in the world and scholars travel from throughout the world to use the collection and meet with the center's staff (DRC 2015).

The disaster tradition continues today, not only from the Disaster Research Center (now at the University of Delaware), but from many disaster researchers throughout the United States and the world (Dynes, Tierney and Fritz 1994). From a practical view, the disaster research tradition has helped provide emergency managers to plan and prepare and to respond and recover. Recent major federal planning documents, such as Comprehensive Planning Guide (CPG) 101 (see resources), explicitly draw upon the disaster research approach to ground its preparedness and response suggestions.

### 3.5.3 Risk and Risk Perception Traditions

Another perspective used to understand hazards and disaster is risk and risk perception. In large part, Paul Slovic (the University of Oregon) helped create the study of risk research over 35 years ago (Decision Research 2015a, b; Slovic 1987). Initially, the field of risk analysis grew out of questions of the environment and safety around nuclear power. Such issues and concerns intensified after the Three Mile Island (TMI) nuclear accident in the United States in 1979 and the Chernobyl (in the former Soviet Union) nuclear power plant explosion in 1986. Today, the concept of risk goes beyond issues of nuclear power to consider a range of risk-related topics.

Originally coming from a social psychological perspective, researchers have tried to understand how individuals view and respond to risk.

For example, a risk perspective may focus on why people perceive some activities as more risky than others (e.g., flying a commercial airliner versus driving a car). It may also concern environmental issues, such as how much of a hazardous substance should be allowed into rivers or waste sites. Or, risk can deal with the trade-offs between having offshore oil wells and their potential damage to the environment from a major oil spill occurs vis-a-vis need for oil. Not all activities dealing with the risk perspective may deal with hazards and disasters, such as topic related to “risky activities” (e.g., smoking and skydiving) or other situations (e.g., possible exposure to cancer from environmental threats).

Risk is also defined as the probability of an event occurring. We filter risk through various levels of perception and understanding. The “cone of uncertainty” that is used to describe a projected hurricane path can be very challenging to understand. Public response depends on understanding the way in which the hurricane may move—thus the cone projects a wide path that changes daily if not hourly. Because we cannot know with a high degree of certainty where a hurricane will strike until 24–36 hours before landfall it is hard to inform the public—who must evacuate most areas 48 hours ahead of impact. People may simply take their chances based on an assumption that “it won’t happen to me” or previous experience with hurricanes. Coupled with a low degree of concern with disasters for most people (Tierney, Lindell, and Perry 2001), it can be very hard to communicate the message and convince the public of an impending risk. Think, for example, of how likely you think it will be that an area hazard might generate a major disaster in your area—and then think through how many preparations you have taken to be ready. Did you pay attention to risk information and see its relevance to your personal safety?

Understanding risk and risk perception can assist us with understanding why people choose to evacuate or not during a hurricane or chemical explosion, or why people may be willing to live next to a potentially hazardous site such as a chemical company or nuclear power plant. Understanding public perception of risk makes us more capable of helping the public by designing preparedness campaigns and organizing evacuations. Box 3.1 features a new perspective—Crisis.

### **3.6 Understanding Disasters**

In order to understand disasters, we rely upon different perspectives or theories of human behavior (see Box 3.2). No one perspective is right or wrong. Rather, each provides insights into the different types of questions we want to ask and solve. The field of emergency management does not have distinct theoretical perspectives it can call its own. Instead, scholars draw upon

### BOX 3.1 THE CRISIS PERSPECTIVE

Scholars from the United States played central roles in developing the hazards, disaster and risk perspectives. Over the last 20 years, European researchers, initially from Sweden and The Netherlands, developed their own approach, known as “Crisis” or “Crisis Management.” One can trace these origins of the Crisis Perspective to the Leiden University Center of Crisis Research in the Netherlands, and Crismart, a research arm of the Swedish National Defense College. Generally, the Crisis perspective focuses upon situations where a society’s values are threatened, there is a short period of time to act, and decision makers must deal with a high degree of uncertainty (Hansen 2003).

The Crisis Perspective developed during and after the demise of the Soviet Union, during which a sense of the unknown and insecurity developed throughout Europe. Initially, political scientists (including those in public administration) launched the first studies of how former countries of the Soviet Bloc managed their new political situation. As a result, many early crisis studies looked at the causes and outcomes of political events in Eastern Europe. Embedded within this approach, the Crisis approach looks at how leadership and decision making affects political and social outcomes. Through time, Crisis scholars have expanded their research topics to include political assassinations, economic sanctions, dance hall fires, and mad cow disease. In addition, they also broadened their research into more traditional hazard and disaster topics such as earthquakes, floods, and dam breaks. While originally drawing upon the expertise of scholars in political science and public administration, representatives from all the social sciences use the Crisis Perspective today (Neal 2012).

The Crisis Perspective provides a fresh way looking at disasters. First, those from the Crisis perspective look at a much broader range of events. Second, their research focuses upon the decision-making process taking place before, during or after the crisis. They focus upon how leaders make their decisions during times of crisis. From a methodological perspective, researchers generally write systematic case studies to understand the management and decision making process that occurs during a crisis. This approach also allows to do retrospective studies along with studying current unfolding events, and comparing all of these events over time (Boin 2009).

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### BOX 3.2 THEORY AND THE DISCIPLINE OF EMERGENCY MANAGEMENT



**Jessica Jensen**

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Scholars often note a lack of attention to the theory development in hazards and disaster research (Drabek 2005; McEntire 2004; National Research Council 2006; Perry 2005; Quarantelli 2005; Tierney 2007; Tierney et al. 2001). There is some truth to the critique. Hazards and disaster theory has received a little attention historically. There are many reasons for this reality which include the applied nature of the work being done (Tierney 2007) and the fragmentation of research on hazards and disasters across many disciplines and their respective outlets (Alexander 1997; Jensen 2010; McEntire and Marshall 2003). Yet, acknowledgment of the lack of attention to hazards and disaster theory and theoretical issues ought not to be taken to suggest that such theory is nonexistent or to say that it is not receiving attention somewhere. Hazards and disaster theory exists and it is receiving attention increasingly within the emerging academic discipline of emergency management.

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### **BOX 3.2 (Continued) THEORY AND THE DISCIPLINE OF EMERGENCY MANAGEMENT**

The discipline studies how humans interact and cope with hazards, vulnerabilities, and the associated events and consequences (Jensen 2014a, 2015). When we use this concept of emergency management as a discipline, it is apparent that the theory related to its purview has been “unrecognized, underused, and underdeveloped” (Jensen 2010, p. 10).

Investigators have produced a significant body of research on hazards and hazard events that is broad in topical coverage and deep with respect to many specific topics. Scholars of anthropology, sociology, political science, public administration, economics, demography, civil engineering, climatology, meteorology, geology, geography, and a variety of other disciplines should continue to contribute to this body of research. The findings of their work now sit in hundreds of edited volumes, more than a thousand case study books, thousands of research center publications, and tens of thousands of scholarly peer-reviewed journal articles.

Reflected within this work are concepts that repeatedly appear, such as hazards, vulnerability, risk, mitigation, recovery, resilience, sustainability, and many others—these same concepts give structure to and appear throughout this introductory textbook. Reflected within this work are other components of theory—components that one can also see in this book. For instance, when post-disaster housing is discussed in Chapter 8, it is based on a known classification of how people move through shelter and into housing. A typology of organized responses is discussed in several chapters. Theoretical frameworks, such as that of sociopolitical ecology or systems, are discussed in Chapter 3, and theories of the middle range, such as those associated with the emergent norm theory also discussed in Chapter 3. Concepts, classifications, typologies, theoretical frameworks, and theories of the middle range are all building blocks, components, or forms, of theory (McEntire 2004).

All of these forms of theory are significant to emergency management both as a discipline and as a profession. Without always being referred to explicitly as a theory, they structure how we approach the topic in study and practice; they help us to understand how various aspects of emergency management work; and, they also help us know what to expect, what we can influence, and the kinds of solutions to emergency management issues that are likely to succeed and fail. And, they are increasingly being identified as theory, communicated to students and discussed with practitioners as such, and further developed through continuing research.

Not only is theory alive and being used, more it awaits discovery and further development. There, among the tens of thousands of pieces of scholarship on hazards and disasters topics, are more of these aforementioned forms of theory that, like those noted above, simply need to be identified, discussed by the students and scholars as important to emergency

*(Continued)*

### **BOX 3.2 (Continued) THEORY AND THE DISCIPLINE OF EMERGENCY MANAGEMENT**

management, and refined through continuing research. Moreover, the integration and synthesis of the literature being produced on similar topics but by different disciplines holds great potential for additional theoretical development. For instance, while all studying human recovery after disasters, psychologists, sociologists, economists, demographers, and social work scholars do so armed with theoretical frameworks and research questions that differ one to the next. All are conducting important research and must continue to do so. However, without integration and synthesis and a conceptual model based on such activity, it is hard for those learning about or researching human recovery to develop a comprehensive understanding of what is entailed in that process and the factors that drive it. Such an understanding is critical for students, scholars, and practitioners of emergency management. Development of this kind of synthesis-based theory is needed and the conditions ripe for it.

Theoretical development is of critical significance to emergency management and it is the subject of much concern and attention. Emergency management scholars and students are currently working on these issues through coursework and research, but, to get to this point, a few critical issues have to be addressed first. Key among these issues is the need for consensus around the idea that the emergency management could and should be conceived of as an academic discipline and, if such consensus existed, to “identify the components of academic disciplines and to identify, recognize, formalize, and/or otherwise build those components for emergency management” (Jensen 2013a, p. i).

Since 1990s, consensus regarding the need for an emergency management discipline has emerged and the efforts of many individuals have gone in building the critical pieces needed to structure a discipline. Building on the work of many scholars (including the authors of this book), a number of FEMA Higher Education Program convened working groups have considered emergency management’s disciplinary domain, the body of knowledge that should inform the discipline, and how the study within the discipline ought to be approached (Jensen 2012a, 2013a). Other FEMA Higher Education sponsored groups have initially suggested some research standards for how contributions of new knowledge and theory are recognized within the emerging discipline (Jensen 2012b, 2013b). Consensus around the ideas from these groups has been built through numerous conference sessions and survey work (Jensen 2014a, b). Further consensus has been developed among an identifiable community of emergency management scholars—individuals who earned or are seeking doctoral degrees at the four institutions offering doctoral degrees in the field—Jacksonville State University, North Dakota State University, Oklahoma State University, University of Delaware (Jensen 2015). It is the job of

*(Continued)*

### BOX 3.2 (Continued) THEORY AND THE DISCIPLINE OF EMERGENCY MANAGEMENT

these students and the faculty with whom they work to integrate, to synthesize, and to study the hazards and disaster research to glean from it what is there in terms of theory and expand upon it through their own work. Finally, the formalization of a communication network for the discipline in the form of a theory and research conference was realized in 2014. The conference “creates the opportunity for researchers to receive feedback on their work; exchange new knowledge; and, build on this new knowledge through discourse and debate” (Jensen 2016). This year, 2016, marks the 3rd annual conference and will be held in advance of the FEMA Higher Education Symposium. The emergence of emergency management as a discipline is well underway as is the use of and attention to theory and theoretical issues within it. The theoretical efforts of those associated with the discipline will shape emergency management education and practice increasingly in the future.

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mid-range theories developed from other disciplines to generate research, critique planning, and move the field forward as a discipline. Without concepts, theories, and methods, we cannot claim that emergency management is a discipline (Blanchard 2005; McEntire 2005; Phillips 2005). In this section, we discuss different perspectives and theories used to describe and explain disaster events and behaviors. Practitioners can draw upon these theories to understand events around them, and even anticipate events that may next occur. These perspectives include collective behavior theory (i.e., emergent norm), organizational theory (i.e., loosely coupled systems), systems theory, socio-political ecology theory and vulnerability theory.

#### 3.6.1 Emergent Norm Theory

Early disaster researchers drew upon the study of collective behavior of new types of behavior during unusual or new circumstances. Rapidly moving and fluid events such as crowds, social protests, riots, and disaster behavior can fall under this definition. Early disaster researchers found that collective behavior theory helped to capture the dynamic, changing characteristics of human behavior during disaster. One specific way to study collective behavior events came through the development of emergent norm theory. Emergent norm theory allows researchers to capture the more spontaneous aspects of disaster behavior, especially during the response phase, by focusing upon processes that generate new norms or new social structure. Norms are accepted ways of

behavior. Social structure reflects how we organize ourselves, such as knowing who is in charge and who should do specific tasks. Emergent norm theory has shown to be both a popular and successful approach to understand disaster behavior (Dynes and Tierney 1994; Turner and Killian 1987).

Let us provide a few examples where the emergent norm perspective has helped us to understand disaster behavior. For example, research from 50 years ago through today shows that altruism, or significant helping behavior develops following disaster. Neighbor helps neighbor just as emergency responders and volunteers come from surrounding communities to help those in need. Crime rates drop significantly after disaster too, rather than the popular media accounts of looting (Fischer 2008; Fritz and Mathewson 1957). As a current example, consider the outpouring of help, aid, donations, and money following the Haitian Earthquake in January 2010, particularly among international partners. In short, international partners—many that had never worked together before—came together to form rescue, relief, and recovery teams. This new set of relationships demonstrates emergence.

Researchers have also found that disasters can dramatically change the structure of organizations during a disaster. Some organizations must expand in order to take on an influx of new volunteers. Volunteer organizations such as the Red Cross and Salvation Army change and adapt to manage how disasters alter day-to-day operations. In other cases, organizations must change the tasks they do. Often following a disaster, construction companies cease their day-to-day operations to assist with debris removal such as clearing roads and properties. Also, new groups and organizations form to assist with the disaster response. For example, right after a tornado, neighbors quite often spontaneously form search and rescue groups and go door to door to assist others (Dynes 1974). Or, at a broader level, city governments may dramatically change, totally altering their organizational structure, putting new people in charge of new disaster-related activities, and plugging other organizations temporarily into city government (Neal 1985). In summary, the findings noted above all came from researchers drawing upon collective behavior and emergent norm theory.

### 3.6.2 Loosely Coupled Systems

Organizational theory has provided many perspectives to help us understand effective disaster response by focusing on process and structure. The emergent norm perspective captures the process of organizational changes before, during, or after a disaster. Examples of organizational change include characteristics of a typical bureaucracy, such as a division of labor, hierarchy of authority, having properly trained people in place for a task, and other characteristics. At times, to create an effective organizational response to disaster, changes in structure and process may simultaneously occur (Weller and Quarantelli 1973).

Disaster researchers occasionally use Weik's (1976) notion of "loosely coupled systems" to understand effective organizational response. Weik's idea originated not from disaster, but from studying local school systems. For example, during most times, a large school system of multiple high schools, middle schools, and elementary schools must work as a whole. Yet, at other times, parts of the school must separate themselves to a high degree from the central administration. Elementary and Middle schools often reflect the social and cultural desires and activities of neighborhoods. Thus, a school in an Italian neighborhood may have special activities outside of the school that focus on Italian culture, but it would not be as meaningful in another part of the school system. In this case, the neighborhood school decouples itself to meet the needs of the neighborhood. Such activities also help generate neighborhood support for the broader school system. Everybody wins in this situation. The overall school mission is met (tightly coupled) while neighborhood schools maintain their own identity when necessary (loosely coupled).

The loosely coupled perspective works well to understand disasters (Perrow 1984). Day-to-day operations may rely upon a tightly coupled, rule driven, and hierarchical organization. As a result, tightly coupled organizations run effectively for day-to-day operations. Yet, when disaster occurs, a tightly coupled system may hurt, not help the situation. As a result, the organization must become more loosely coupled. Organizational members may need to alter their organizational structure, improvise new rules, and at times even operate as separate and even isolated units. Perrow's classic book, *Normal Accidents*, provides two examples. Many of you may have seen the movie *Apollo 13* starring Tom Hanks, which documented an actual event. Any spaceflight, including one to the moon, has a very rigid flight plan that both astronauts and mission control must follow. The organizational structure of mission control is tightly coupled—people do not deviate from the flight plan for any reason. Yet, as you may recollect, a side of the spacecraft exploded, with oxygen leaking from tanks. Suddenly the flight plan became useless. On the ground, mission control reorganized itself into a loosely coupled organization (e.g., changing its tight division of labor and hierarchy, eliminating old rules, creating new flight rules) and literally rewrote the flight plan on the fly. If mission control had stayed as a tightly coupled organization, the three astronauts would have died. Instead, by adapting and becoming flexible, the astronauts survived.

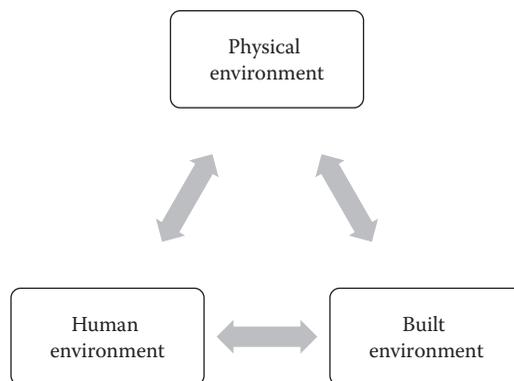
Similar to space missions, the operations of nuclear power plants demand a tightly coupled organizational system. During regular operations, managers and staff must follow the rules by the book, including following any and all orders by supervisors and avoiding any improvisation. Engineers design the rules to avoid an accident. Yet, situations occur outside of the control of the operators. The book has no guidance or rules to solve the problem. Suddenly, these highly trained "by the book" managers and operators must

improvise, changing their organizational structure and creating their own rules. Those in the operations center may separate themselves from higher-level managers since they are the only ones closest to the data and understand the dynamics of a possible meltdown. Yet, Perrow (1984) fears that in some tightly coupled systems such as nuclear power plants, when events unfold creating a crisis, these highly trained by-the-book managers and operators *will not* be able to change from a tightly coupled to loosely coupled management system. The result? A nuclear power plant meltdown. These lessons are crucial for disaster response. Yet, even today a rigid, some emergency coordinators still advocate a tightly coupled “command and control” model for disaster response. In coming chapters, we show why loosely coupled type management systems are more effective during disaster.

### 3.6.3 Systems Theory

Systems theory in emergency management refers to looking at how the built environment, physical environment, and human beings interact together (see Figure 3.2; Mileti 1999). When all the parts fit well they work together with minimal problems. However, when one part does not work well, the other parts do not and a disaster may result. As an example, people like to live in beautiful locations like beach communities. However, such areas often experience weather extremes including flooding and hurricanes (the physical environment). Without taking sufficient precautions to elevate or protect the built environment, significant damage or loss of life may occur. To understand systems theory, we define some of the terms used in systems theory, and then provide an example of how systems theory works in emergency management.

The built environment refers to buildings, the infrastructure including utilities (electricity, gas, and water), and transportation (roads, bridges, rail,



**FIGURE 3.2** Systems theory. (Based on Mileti, Dennis, *Disasters by Design*, Joseph Henry Press, Washington, D.C, 1999.; Phillips 2015, with permission).

and ports). The physical environment includes what exists in nature, such as water (e.g., snow, rain, and ice), wind (e.g., tornadoes and hurricanes), or the earth (e.g., earthquakes and landslides). Finally, the human system refers to where and how people may live. Each system interacts with each other. In 2015–2016, for example, a weather event called El Niño produced unusual rains in California and heavy snow in the plains. The impacts disrupted transportation, caused power outages, and loss of life. Rather than a single system being responsible, like the weather, the problems occurred because of the interaction among the systems.

The problem is not likely to go away any time soon. For thousands of years, people have enjoyed settling next to rivers (i.e., physical environment). These waterways provide a source of water, food, and transportation. In short, this location provides a means for people to live, develop an organized culture and create meaningful social relationships (human systems). In putting down roots in such areas, people build highways and bridges, develop water and waste systems, and construct homes and businesses (i.e., the built environment). However, roads may flood preventing transportation to work and school. Fast moving flood waters can destroy bridges when debris builds up behind and cause failures. Flooding can also contaminate water systems and destroy electrical and communication systems. Homes and businesses will also become inundated. As a result, people's lives become totally disrupted (human system). People may drown or become injured. Others may have to be evacuated. Businesses may be lost forever.

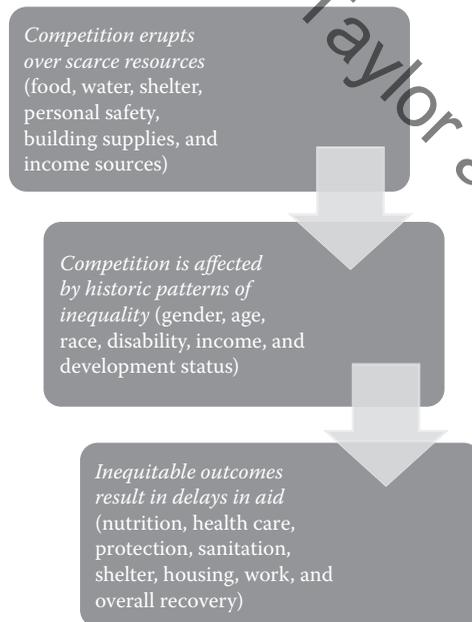
After the event, local residents, politicians, and the business community (the human system) may look at ways to lessen the impact through mitigation. They may not allow homes or businesses (the human system) to (re)build (the built environment) in floodplains (i.e., the physical environment). They may build levees or dikes (the built environment) to lessen the impact of future flooding (physical environment) and reduce injuries and economic impacts (human systems).

In summary, the systems approach provides us a means to see how the human, built and physical environment all interact. It can help tell us how certain actions (e.g., living in tornado alley) can impact the residents of an area. In turn, such knowledge can help us mitigate, prepare for, respond to, and recover from such events. Systems theory can also allow us to see how who is more likely to become victims. For example, the poor are more likely to live in inexpensive housing such as mobile homes than any other group. Thus, when a tornado hits a community, much more damage occurs to the mobile homes than to a well-built home. As a result, the poor experience a higher degree of vulnerability to a disaster than those with more economic resources (Mileti 1999; Phillips et al. 2010). Such differential outcomes in human systems have been explained by two theories that we turn to next.

### 3.6.4 Sociopolitical Ecology Theory

Another popular and effective approach to understanding how disasters impact people is Sociopolitical Ecology Theory. Specifically, this theory looks at competition among various social groups to see who may become victims and who may recover more quickly than others after a disaster (Peacock and Ragsdale 1997, see Figure 3.3). Competition is defined in this theory as the efforts people engage in to secure scarce resources such as food, water, and shelter. When an earthquake occurs, such as the 2005 event in Pakistan, enough tents may not be available for all of the displaced. With winter rapidly approaching, those who fail to secure shelter face increasing danger for their lives.

There will be winners and losers in the process of securing resources, whether they are for mitigation, preparedness, response, or recovery. Single mothers for example, of whom about one-third live below the poverty line, will simply not be able to afford hurricane shutters or tornado safe rooms. Their families will bear disproportionate risk when hazards turn into disasters. The Northridge, California, earthquake of 1994 claimed about 60 lives, injured more than 9,000 and left about 20,000 victims homeless (USGS 1994), while over 200,000 Haitians died in the 2010 earthquake. Even the cost of developing a preparedness kit may be impossible for low-income households, senior citizens, or students like yourself. The 2005 earthquake in Pakistan led to competition over food, health care, and other survival resources. The competition



**FIGURE 3.3** Sociopolitical ecology theory explains that when a disaster occurs.

resulted in women and children securing fewer resources than men, which led nongovernmental organizations to provide female-friendly health care sites (Sayeed 2009). Gendered competition in other locations (Sri Lanka after the tsunami, Haiti and Nepal after the earthquakes) has revealed that some women and children face significant, additional threats to their personal safety including human trafficking (Burke 2015).

Recovery is even more difficult. Because lower income households must opt for affordable units, they tend to end up in manufactured housing, apartments closer to floodplains, and buildings that have not been retrofitted for seismic activity. Loss of life is typically higher in such locations. Coupled with loss of personal possessions, clothing, work resources or cars, overcoming the burden of disaster recovery may not be possible. Even in the business community, disparity exists. Smaller businesses fare less well than larger chains with considerably more assets. Smaller businesses are more likely to be owned by women and minorities.

Competition over scarce resources is likely to generate conflict. After Katrina for example, government officials made difficult decisions to destroy public housing units. Local protestors claimed that the units remained livable and decried reconstruction choices that reduced the number of affordable units. Five years after Katrina, uneven rebuilding has taken place across the city of New Orleans. Areas historically populated by racial and ethnic minorities took on high water levels with elderly African American men dying in numbers far higher than their percentage of the city's population (Sharkey 2007). Across New Orleans, the demographics of the community have changed as many low-income and minority residents could not return or afford to rebuild (Kroll-Smith, Baxter, and Jenkins 2015). Sociopolitical ecology theory directs researchers and emergency managers to observe who in their community may be at highest risk for disaster impact and to design measures that reduce disproportionate numbers of deaths, injuries and property losses.

### 3.6.5 Vulnerability Theory

Two divergent perspectives provide contrasting approaches to explain what happens in disasters. Called the dominant and the vulnerability perspectives, each focuses on why disasters occur, what effects they cause, and what can be done by emergency managers (Fordham et al. 2013). The dominant perspective may sound familiar, as it emphasizes the physical hazard itself—an earthquake happens and a home topples as a result. To care for those affected, emergency managers would move in using a combination of engineering and science to recover. The home would be rebuilt with new seismic bracing standards created within the building code itself. The goal would be to reduce future damage by overcoming the challenge presented by nature.

In contrast, the vulnerability perspective looks at other reasons to explain why the damage occurred. Socioeconomic and political circumstances are considered over the physical hazard itself. For example, if a flood occurs and homes are inundated—why did that occur? Could it be that homes are situated too close to the river or allowed to be built in a floodplain? It could be that policy decisions permit these homes to be built although history and societal relationships also play a role. In some locations, homes are subject to flooding after generations of segregation based on racial and ethnic discrimination (Phillips, Stukes, and Jenkins 2012). Subsequent generations may have lacked the financial means to relocate or may have built strong social ties that provided useful resources, encouraging people to stay. Similarly, places like Haiti or Nepal, which suffered devastating earthquakes in 2010 and 2015, lost hundreds of thousands of people. They died in buildings that collapsed on them, because they could not afford stronger dwellings. Similar outcomes occur after tornadoes strike affordable but less resistant mobile homes, where even an EF1 tornado can destroy a dwelling. In 2004, the Indian Ocean tsunami claimed about 300,000 lives with approximately 80% being women and children. Many perished waiting on the shore for fishermen to return from the sea. Their role? To process and sell the fish as part of a gendered division of labor in places like India and Sri Lanka.

The vulnerability perspective then says that the hazard itself is not the problem. Rather, it is the way in which society marginalizes people by age, disability, gender, race, or income. Overcoming vulnerability requires an approach that empowers those historically marginalized to reduce their vulnerability. Vulnerability reduction also requires that societies address historic patterns of discrimination and marginalization that keep people subject to risk. To illustrate, consider what happened to people with disabilities after hurricane Katrina. A catastrophic event, the federal government lacked sufficient resources to provide accessible temporary housing units—which led to a lawsuit that changed things (*FEMA v. Brou*). Movement through the recovery process meant facing even more barriers, particularly a lack of transportation and access to disability resources and services (Stough et al. 2015).

One common approach is to build bridges between those deemed potentially vulnerable, such as people with disabilities, and those in positions of authority, such as emergency managers. By working together, emergency managers and people with disabilities can identify the potential impacts of disasters and how to reduce impacts. People dependent on mobility devices, for example, may require access to a location with power (such as a fire station) to remain independent. Or, shelter managers will benefit from talking to people with disabilities to design movement pathways, appropriate nutritional options, accessible showers, and advocacy efforts to help people return home (NCD 2009).

### 3.7 Embracing a Multidisciplinary Approach

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As noted earlier in this chapter, defining disaster is not a simple task nor is the decision on which theory—from which discipline—to use. As noted earlier in this chapter, there are several terms important to emergency management: hazards, disasters, risk, and crisis. Initially, geography helped establish the hazards perspective, sociology provided the foundation for disasters, (social) psychology laid the groundwork for risk, and political science established the crisis perspective. The hazards perspective first moved toward a more multidisciplinary approach, drawing upon sociology and social psychology. As more scholars from other social sciences became involved in studying disasters (e.g., psychology, political science, public administration, and anthropology), a broader knowledge base developed to inform the practice of emergency management. Over the last decade, social scientists learned that a multidisciplinary perspective from the social sciences would provide a more robust understanding of disasters.

Of course, those in the natural and physical sciences, such as meteorology, physics, geology, engineering, and other fields made individual contributions by studying the actual agent or how the agent impacted the built environment. Their work has also become more multidisciplinary by involving social scientists. For example, by the early 1980s meteorologists had devised rather sophisticated equipment to detect, show, and predict the strength and paths of tornadoes. Despite setting this equipment up, the number of annual deaths due to tornadoes and severe storms did not decline. However, just hearing a warning does not guarantee that people will take protective action. People must be made aware of the hazard, educated about the warning system and how it works, and given explicit instructions on how to take protective action. Studies also suggested that the warning messages must also be repeated in multiple languages and through multiple modes, and the geographical region must be specified in order to personalize the message to those at risk. Once meteorologists worked with social scientists in devising a social science based tornado warning system, coupled with the sophisticated equipment, deaths from tornadoes and severe storms decreased (Quarantelli 1993, for an example, see the CASA project at the University of Massachusetts, <http://www.casa.umass.edu/>). In recent years, the Office of the Federal Coordinator of Meteorology has established a working group to integrate social science findings into partnerships with those who detect, predict, and deliver meteorological information. The goal: to reduce deaths among those most vulnerable to weather particularly senior citizens, the poor, people with disabilities, and the traveling public that may be unaware of risks down the road (for more, see the resources section).

Sylves (2008) punctuates the importance of a multidisciplinary approach toward disasters for policy making in governmental settings. Whether at the local, state, or national level, those involved in disaster policy must have a wide range of knowledge. For example, making policy on earthquake preparedness would include geologists (understanding fault lines in an area), planners and geographers (land use), and architects (creating specific building codes), geographers (hazards), and sociologists (public education and risk communication programs). Taking a broad array of courses will serve students well as they pursue a degree in higher education.

### **3.8 The View from Emergency Management Higher Education**

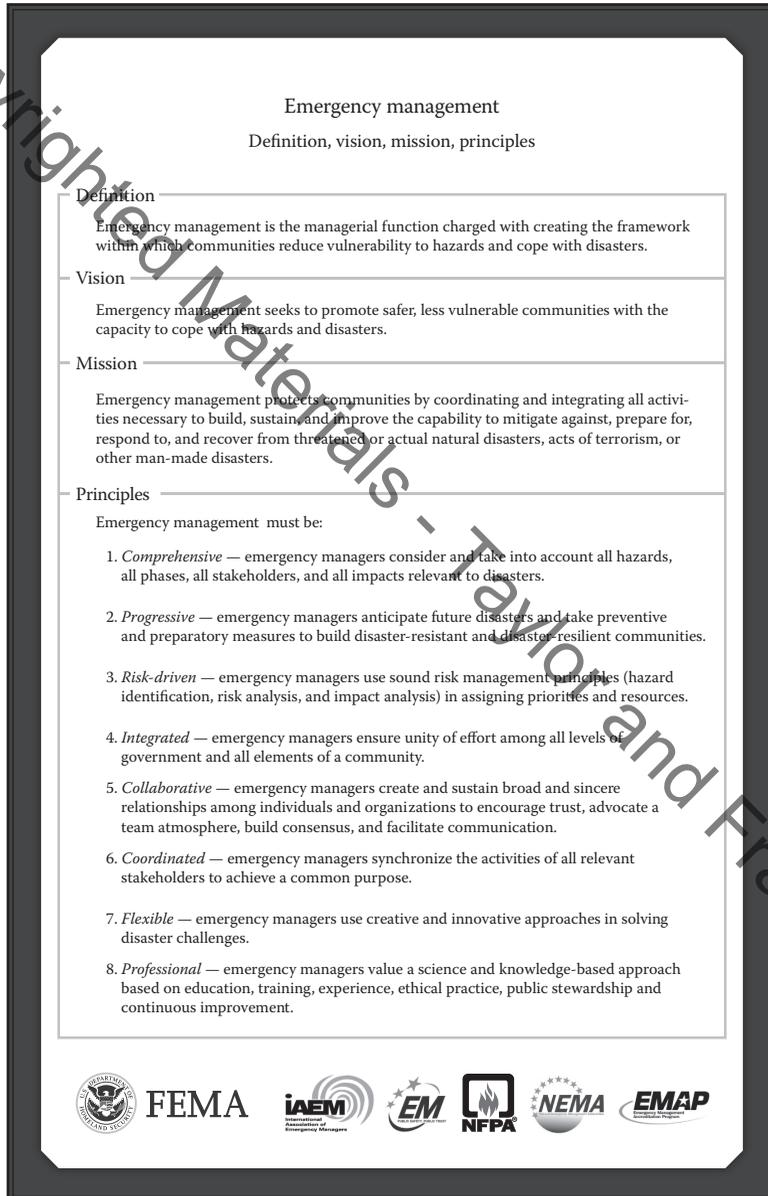
The annual FEMA Higher Education Symposium (which started in 1998), and offshoots from these meetings, has provided a foundation for defining emergency management and what we should teach in the field. Spirited discussion among those who attend have led to some general agreement on what to call “emergency management” and if it constituted a field, a discipline, or a profession (Urby and McEntire 2015). Four common characteristics for a separate field to be named (like sociology or physics) include occupational groups, a body of knowledge, standards of contact, and professional qualifications (Urby and McEntire 2015). We argue in this text that emergency management has indeed arrived at such a standalone designation.

As the field started, no real consensus existed on what emergency management was and what should be taught. New programs found it difficult to find qualified faculty members who were knowledgeable with the disaster and hazards literature. Since programs were small, administrators placed programs within other academic units, often meaning the emergency management program lost part of its identity or needed resources. Faculty had few quality textbooks to select from. Those within the university did not see emergency management as a sound academic discipline. Many emergency managers saw emergency management programs as just an exercise in “book learning” with little or no practical application (Neal 2000). That has changed with the rapid development of well over 100 degree programs in the United States alone along with programs in Canada, Mexico, New Zealand, India, the United Kingdom, South Africa, and many other locations (see resources for a list).

Today, students graduating from emergency management programs can use a well-developed body of knowledge to secure an occupation. They can pursue additional credentials through graduate degrees and/or certifications. You will be meeting some of them as you read this book. Take the

time to read their biographical statement and learn about their journey into the field of emergency management.

As a result of considerable discussions at the FEMA Higher Education Symposium and other conferences, a set of guiding principles has developed for the field of emergency management (FEMA 2008, see Figure 3.4). As we read other statements in the document, similar concepts appear again and again—concepts that we have discussed in this chapter and throughout the book. These concepts include vulnerability, hazards, disasters, risk,



**FIGURE 3.4** The definition, vision, mission, and principles of emergency management.

preparedness, response, recovery and mitigation. Our journey continues with the next chapter by providing an overview of how the body of knowledge has been produced for the occupation of emergency management.

## Summary

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The profession of emergency management deals with managing disasters. Yet, among scholars and emergency managers, no firm definition exists. Many today still draw upon Fritz's (1961) definition, defining disasters as a perceived event that occurs rapidly in a specific time and space leading to social disruption. Today, we need to think of disasters in a more sophisticated way—as if it were a variable. During everyday life, emergencies occur (e.g., heart attacks, car accidents, and house fires). But such events are part of the daily fabric. A disaster, such as tornadoes, floods, hurricanes, explosions, among many other events, may damage the infrastructure of a community, disrupt people's lives, and undermine workplaces. A catastrophe may cause total damage and create absolute social disruption within a wide geographical area for a long time. Certainly the impact of Hurricane Katrina or the Fukushima earthquake/tsunami/radiological release would fit in this category. Emergency managers engage in activities to manage disasters and catastrophes.

The NGA (1979) report made such notions as the four phases of emergency management and CEM important tools for the profession. These concepts are still important today for anybody engaged in emergency management. Emergency managers may work across all four phases or may even specialize in one, such as mitigation.

Several different research traditions have emerged within the field: hazards, disasters, risk, and crisis. Although each tradition grew from different academic fields (such as geography, sociology, social psychology), researchers have slowly merged these perspectives in part to create a more multi-disciplinary approach to the field. Researchers also draw upon various theoretical perspectives to understand disasters including organizational theories, emergent norm theory, sociopolitical ecology theory, and vulnerability theory. Finally, emergency management as both an academic field and a profession continues to grow as a multi-disciplinary area.

## Discussion Questions

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1. Discuss why it is important to be able to distinguish between an emergency and a disaster, and a disaster and catastrophe? Why are these differences important for both the emergency manager and the social scientists studying people's behavior?

2. The National Governor's Association Report (1979) remains a key document today. What are some of the important concepts introduced in this report, and how many of these concepts are still used today by both emergency managers and researchers? How have these concepts influenced emergency management?
3. What specific insights into disaster behavior to each of the three perspectives (i.e., hazards, disasters, risk) provide? Do you see these perspectives becoming more separate from each other, or blending together?
4. How do the broader perspectives or theory on disaster behavior provide unique perspective of what occurs before, during or after disaster? Think about how each perspective gives a unique view to understand behavior during preparedness, response, recovery, or mitigation.
5. Explain why we may have so many different definitions of disaster? This includes different definition among both emergency managers and disaster researchers? Why might different people and different organizational representatives see the same event and (1) define it an emergency rather than a disaster?, (2) have one claim the event is one type of a hazard, whereas another may say the event was a totally different type of hazard (e.g., flood versus a technological failure?)?
6. To what degree to you agree or disagree with the definition of emergency management provided in this chapter? How might you change the definition? Why is it defining emergency management might be a difficult task?

## Resources

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- Those involved in designing and teaching emergency management courses have also discussed and written extensively on definitions of emergency management. This link will give you access to many other papers and documents that discuss defining emergency management and related concepts to the field: <https://training.fema.gov/hiedu/emprinciples.aspx>, last accessed February 3, 2016.
- CPG 101 (FEMA), [https://www.fema.gov/media-library-data/20130726-1828-25045-0014/cpg\\_101\\_comprehensive\\_preparedness\\_guide\\_developing\\_and\\_maintaining\\_emergency\\_operations\\_plans\\_2010.pdf](https://www.fema.gov/media-library-data/20130726-1828-25045-0014/cpg_101_comprehensive_preparedness_guide_developing_and_maintaining_emergency_operations_plans_2010.pdf), last accessed February 1, 2016.
- To learn more about Disaster Declarations in the United States, visit [https://www.fema.gov/disasters/grid/year/2015?field\\_disaster\\_type\\_term\\_tid\\_1=All](https://www.fema.gov/disasters/grid/year/2015?field_disaster_type_term_tid_1=All), last accessed February 2, 2016.
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