

**Session No. 8**

---

**Course Title: Earthquake Hazard and Emergency Management**

**Session Title: Disaster Phases and Earthquake Policies**

**Author: James R. Martin, II**

**Time: 120 minutes**

---

**Objectives:**

- 8.1 Describe the “nature” of disaster losses and discuss strategies for disaster reduction.
- 8.2 Describe the four management phases of a natural disaster.
- 8.3 Identify the primary parties typically affected by and involved in a disaster.
- 8.4 Explain what “institutions” are, why they matter, and explain the need for public sector involvement in mitigation.
- 8.5 Discuss the “federalism” issue and describe the property rights issue.
- 8.6 Explain the evolution of disaster management programs.

**Scope:**

The concepts presented in this session are designed to provide a basic understanding of disasters and their management. Concepts such as the four disaster phases, the major agencies involved with disasters, and a brief history of U.S. disaster management programs are covered. Each of the major issues presented in this session will be discussed in much greater detail in following sessions. There will be overlap with other sessions such as those on planning and earthquake research and information programs.

**Readings:**

*Required student reading:*

None.

*Suggested instructor reading and resources:*

Meliti, D. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Joseph Henry Press.

FEMA. 1998. *Planning for Seismic Rehabilitation: Societal Issues, 1998, FEMA 275*.

Useful Internet web pages: <http://www.fema.gov>

---

**Handouts:**

Handout 8.1 Homework Assignment 8.1.

**Electronic visuals included:** [see Session 8 – *Electronic Visuals.ppt*]

- 8.1. Strategies for Disaster Reduction
  - 8.2. What's at Risk in the U.S.?
  - 8.3. What's at Risk in the U.S.? (continued)
  - 8.4. Disaster Phases
  - 8.5. Typical Imbalance between Immediate Disaster Responsibilities and Local Resources
  - 8.6. Map illustrating the better performance of better-designed structures in the high-risk zone
- 

**General Requirements:**

The lecture should begin with an examination of the nature of hazard losses and then focus on the four phases of disaster management, key concepts associated with policy, and the various federal programs involved with disasters. The instructor should mention that much of the information presented in this session will be built upon in later sessions, especially the four phases of disaster management. To engage the students in this text-intensive material (not many interesting visuals can be used to discuss policy issues), the instructor should attempt to generate discussions of the material as it is presented. Alternatively, the instructor may wish to assign the lecture notes as reading material followed by an in-class discussion of the key points. The main points to get across are that policy and the institutional environment for mitigating hazard losses are complex; significant changes in policy are occurring because of skyrocketing costs; and, emphasis has shifted to reduction of losses by modifying exposure to hazards (mitigation). The homework assignment should be handed out following the last objective and one week should be allowed for completion.

Additional requirements:

Computer and projector.

---

**Objective 8.1 Describe the “nature” of disaster losses and discuss strategies for disaster reduction.**

**Requirements:**

The content should be presented as lecture, supplemented with electronic visuals. The instructor is cued as to when the electronic visual files should be presented.

Electronic Visuals Included:

Electronic Visual 8.1	Strategies for Disaster Reduction
Electronic Visual 8.2	What's at Risk in the U.S.?
Electronic Visual 8.3	What's at Risk in the U.S.? (continued)

**Remarks:**

**I. Nature of Disaster Losses:**

**A.** Two basic philosophies exist with respect to viewing disaster losses. Disaster losses can be looked at as the result of either:

1. Bad luck associated with random natural events.
2. Consequences of decisions affecting exposure:
  - a. Where to live (in a flood plain? near an active fault line?).
  - b. How to build (adequate measures taken to ensure resilient structure?).
  - c. What kind of warning systems to employ (early warning system? coordination at all levels – local, regional, state?)

**B.** **The philosophy adopted strongly influences the manner in which disasters are approached and dealt with.** There is an increasing agreement and realization that we “design our own disasters” by the decisions we make and actions we take in hazardous regions (Mileti, 1999).

**II. General strategies for disaster reduction have been outlined below (USGS, 1995).**  
[*Electronic Visual 8.1*]

[*Instructor note: Mention that these concepts will be discussed in much greater detail in future sessions*].

- A.** Identify areas/regions of greatest risk. **Risk assessment is an important first step in developing strategies and mitigating risks.**
- B.** **Focus limited resources where they can do the most good.** Limited resources always will be an impediment to hazard reduction and it is important to **optimize** the benefit of such resources.
- C.** **Increase public awareness of vulnerability.** Education, especially continued communication of hazards posed is an important factor that will determine whether entities will take desired actions (Tierney et al., 2001).
- D.** **Implement hazard mitigation policies and practices.**

- E. Prepare for emergency response, recovery and reconstruction.**
- F. Improve prediction and warning capabilities.**
- G. Learn from previous disasters to prevent repetition of mistakes.** Not only is it vitally important to learn as much as possible from each disaster, but the time period following disasters often is the critical time-window of opportunity to effect policy changes and advance key initiatives.
- H. Share information and experience worldwide.** Many valuable lessons have been learned and global data sharing is increasing the effectiveness of mitigation efforts. Organizations such as National Earthquake Hazard Reduction Program (NEHRP), Earthquake Engineering Research Institute (EERI), the National Science Foundation (NSF), and the Earthquake Megacities Initiative (EMI), play an important role in facilitating global partnerships and learning opportunities.

### **III. What's at Risk in the United States?**

- A.** The U.S. has a vast stock of infrastructure that includes (USGS, 2004):  
[*Electronic Visuals 8.2 and 8.3*]
  1. Tens of millions of single and multiple family dwellings.
  2. More than 5 million miles of roads, railroads and transit systems.
  3. More than 5 million miles of underground pipelines for oil, gas, water, and electrical utilities.
  4. Hundreds of thousands of federal, state, and private sector buildings.
  5. Hundreds of thousands of schools, colleges, and universities.
  6. Hundreds of thousands of factories and manufacturing facilities.
  7. Hundreds of thousands of small businesses and shopping centers.
  8. About 575,000 bridges.
  9. Tens of thousands of civic centers and places of public assembly.
  10. Tens of thousands of hospitals and health care facilities.
  11. Tens of thousands of monuments, historic buildings, and museums.
  12. Thousands of ports and harbors.
  13. Thousands of conventional power plants.
  14. Thousands of military bases.
  15. Thousands of airports.
  16. Thousands of dams.
  17. Hundreds of national forests and parks.

- B. Of particular concern is the fact that much of this infrastructure is critical (i.e., key buildings bridges, utilities), is aging, and poorly resistant to seismic shaking (NRC, 2003).

**Objective 8.2 Describe the four management phases of a natural disaster.**

**Requirements:**

The content should be presented as lecture, supplemented with electronic visuals. The instructor is cued as to when the electronic visual files should be presented.

Electronic Visuals Included:

Electronic Visual 8.4 Disaster Phases

*[Instructor Note: Mention that the disaster phases covered below will be presented in much greater detail in Sessions 9 – 11].*

**Remarks:**

**I. There are four phases of disaster management:**

- A. **Mitigation** takes place before or between events to reduce impacts. It includes zoning ordinance, building codes, structural improvements, etc.
  - 1. **Mitigation is the cornerstone of disaster management.**
  - 2. It involves the continuing effort to **lessen the impact that hazards** have on people and property and to reduce the scope of disasters.
  - 3. Mitigation is defined by FEMA as "sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects."
  - 4. Mitigation can involve actions such as:
    - a. Promoting sound land-use planning based on known hazards.
    - b. Buying insurance.
    - c. Relocating structures.
    - d. Developing, adopting, improving, and enforcing building codes and standards.

- e. Engineering and retrofitting facilities to withstand earthquakes.
  - f. Developing and implementing business or community plans to reduce susceptibility to hazards.
- B. Preparedness** involves development of community training and public awareness, logistical support and communications, basic supply needs, early warning, and monitoring.
- 1. Preparedness takes the form of plans or procedures designed to save lives and to minimize damage when an emergency occurs.
  - 2. Planning, training, and disaster drills are essential elements of preparedness. Activities should be designed to ensure that when a disaster strikes, appropriate personnel will be able to provide the best response possible.
- C. Response** (time-critical) involves emergency operations, damage surveys, equipment, human resources, funds, communication, and baseline maps.
- 1. Response is defined as the actions taken to save lives and prevent further damage in a disaster or emergency situation.
  - 2. Response involves putting preparedness plans into action. Response activities may include damage assessment, search and rescue, fire fighting, and sheltering victims.
- D. Recovery** involves, rebuilding, claims, feedback from involved parties, etc.
- 1. Recovery involves the actions taken to return the community to normal following a disaster.
  - 2. Repairing, replacing, or rebuilding property are examples of recovery activities.
- E.** The symbiotic relationship among the four phases of disaster management are represented in the visual below: [*Electronic visual 8.4*]



Visual 8.4 – The four phases of disaster management. Visual credit: DisasterHelp.gov at <https://disasterhelp.gov/portal/jhtml/help/instructions.jhtml?community=>

**Objective 8.3 Identify the primary parties affected by and involved in a disaster.**

**Requirements:**

Present the material as lecture and encourage student input and discussion.

*[Instructor note: The roles of each of the parties listed below will be played out by the students in a classroom exercise later in the course. They are presented here mainly to promote discussion and have the students begin to think about specific emergency management issues.]*

**Remarks:**

**I. Parties Typically Involved in Disasters:**

- A. Forecasters/Researchers (U.S. Geological Survey [USGS], National Weather Service [NWS], National Oceanic and Atmospheric [NOAA], universities, etc.).
- B. Federal Government (Federal Emergency Management Agency [FEMA], National Guard, Army Corps of Engineers [COE], etc.).
- C. State government (Office of Governor, state police, state emergency management offices).
- D. Local/municipal/regional government agencies and actions (transportation departments, water distribution, wastewater treatment, clearing trees, garbage disposal, emergency planners).
- E. Local emergency agencies (police, fire, emergency medical personnel, hospitals).
- F. Aid agencies (Red Cross, church organizations).
- G. Insurance companies (claims).
- H. Utility companies (electricity, natural gas, telephone).
- I. Businesses (hardware/lumber stores, groceries).

## Session 8: Disaster Phases and Earthquake Policies

- J.** Engineers/planners/scientists (mitigation, damage assessment, recovery, **communication with public**).
- K.** Victims (casualties, property damage, displaced persons, loss of business operations, etc.).
- L.** News media (communication channels).
- M.** Others?

**Objective 8.4 Explain what “institutions” are, why they matter in emergency and hazard management, and why public sector involvement is required for disaster reduction.**

### **Requirements:**

The content should be presented as lecture, supplemented with electronic visuals. The instructor is cued as to when the electronic visual files should be presented.

### **Remarks:**

#### **I. Importance of “Institutions.”**

- A.** “Institutions” basically are structured procedures and decision processes such as government permit programs, government subsidy programs, etc.
- B.** **Institutions are important because they influence behavior affecting exposure to disasters.** Existing programs, procedures, and processes, such as building permits, can either facilitate hazard reduction by guiding appropriate practices and behavior, or impede needed progress – established institutions can be slow to change and the bureaucracy associated with multi-tiered processes can increase opportunities for miscommunication.

#### **II. Why Is Public Sector Involvement in Hazard Reduction Inevitable and Essential?**

- A.** Most governments inherently have humanitarian concern for its citizens.
- B.** Governments have fear of social and economic disruptions posed by disaster.
- C.** The scope of the problem typically is beyond that which can be addressed by the private sector, and governments necessarily have to be involved to address major disasters and related issues.
- D.** The “public goods” problem – governments typically are the only entities with motivation to develop major disaster mitigation projects, because such projects necessarily will benefit everyone in the region, not just those that pay for and

## Session 8: Disaster Phases and Earthquake Policies

build the facility – there would be less incentive on the part of the private sector to pay for such projects. For instance, a floodwall in a town would benefit everyone who lived there, not just the builders of the structure, and there is no direct way to recover such costs and/or regulate use in the private sector. “Public goods” projects are inherently government-sponsored.

- E.** Inadequate information about disaster-related risks. Typical governments are the only entities that possess enough money to fund studies and develop and share knowledge to address disasters and mitigation strategies.
- F.** There often is irrational human behavior with respect to low probability/high consequence events. Mitigation actions by individuals often can be governed more by emotional responses than careful, informed decisions. Actions that are not developed by informed entities generally do not optimize resources and may produce higher risks. Actions should be sustainable and coordinated.

**Objective 8.5 Discuss the “federalism” issue and property rights issue and how these impact hazard management and disaster mitigation.**

**Requirements:**

The content should be presented as lecture, supplemented with electronic visuals. The instructor is cued as to when the electronic visual files should be presented.

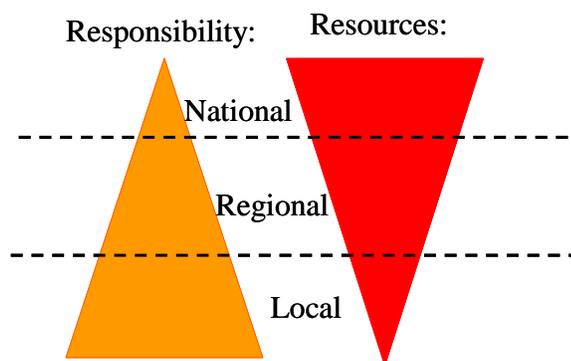
Electronic Visuals Included:

- Electronic Visual 8.5      Typical imbalance between immediate disaster responsibility and local resources
- Electronic Visual 8.6      Map illustrating the better performance of better-designed structures in the high-risk zone

**Remarks:**

**I. The “Federalism” Issue.**

- A. Federal:** “of or constituting a form of government in which sovereign power is divided between a central authority and a number of constituent political units.”(American Heritage, 2000).
- B.** In a “federal” governmental system, governmental responsibility is divided among federal, state, and local levels of government. This is the system of government in the U.S.
- C. Effective disaster management requires coordinated action at all levels.** There have been number of studies that cite **poor coordination level of government as a major issue impediment to disaster reduction (Tierney et al., 2001). Thus, the inherent layered structure of government often presents impediments.** Also, local responsibility is high, but typically the resources are inadequate, as shown in the plot below: [*Electronic Visual 8.5*]



*Visual 8.5 – Graph showing the typical imbalance between immediate disaster responsibility and available resources. The bulk of immediate response will fall on local agencies that have fewer resources than national governments. Visual adapted from Bendimerad (2002).*

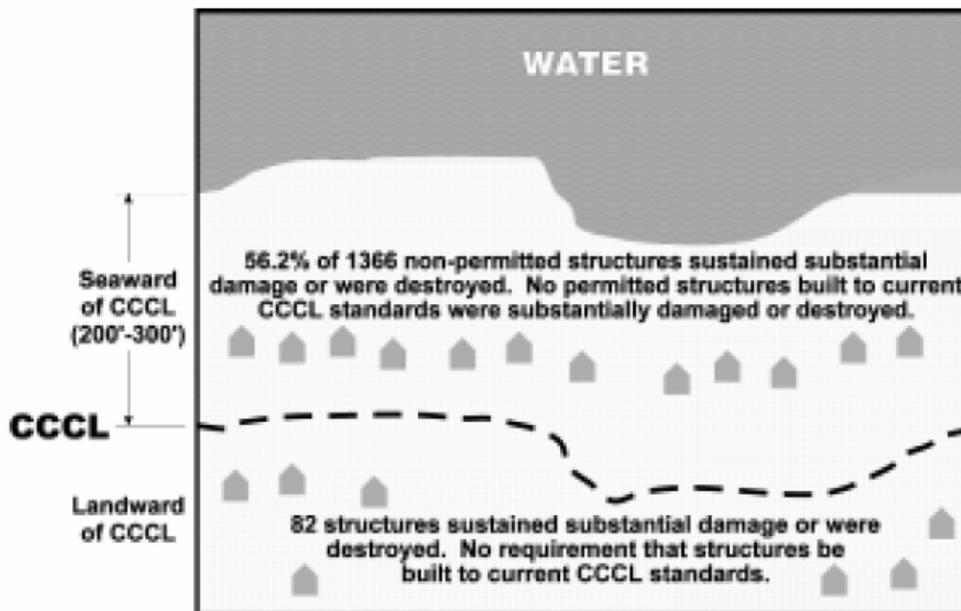
## II. The Property Rights Issue and Land-Use Planning.

- A. Federal and state constitutions prohibit the “taking” of private property.
- B. Governments have power to regulate property rights under the “police power” to protect public health, safety, and welfare (e.g., prohibiting construction in a floodplain, condemning a damaged residence following a major earthquake).
- C. The line between “taking” and “regulating” is fuzzy and must be defined on a case-by-case basis by the courts.
- D. **Land-use planning and ordinances at the state, regional, and community levels also play a key role in disaster mitigation**, as discussed below. (United Nations, 2004):
  1. Land-use planning generally is most effective in areas that have not been developed, or where there has been minimal investment in capital improvements. Since location is a key factor in determining the risks associated with natural hazards, land use plans are a valuable tool in that they can designate low-risk uses for areas that are most vulnerable to natural hazards impacts.
  2. Land-use plans are implemented through ordinances and policies, zoning laws, police power, and through a jurisdictions capital improvement program.
  3. Tools such as transfer of development rights, planned unit developments, cluster development, and similar approaches can ensure that the property owners receive an adequate return on their investments while still providing community protection against natural hazards.
  4. Microzoning enables identification of disaster-prone areas at a local scale. This can be used to maintain low levels of building density or to avoid development in such areas. For instance, microzoning has proved to be particularly effective in establishing setback distances from active fault lines within which building is prohibited (FEMA, 1998).
  5. For example, floodplains, steep slopes, areas subject to liquefaction, and areas susceptible to wildfires, can be designated for open space uses while the property owner is allowed to develop the remaining areas of the property at a higher density. This method not only reduces the potential for damages, but open space uses also will enhance the marketability and attractiveness of the development, and may even reduce the developer’s costs.

6. A community also can influence the location and density of development through its capital improvement plans, which determine where the community places critical infrastructure needed for development, such as roads, water supply, and wastewater treatment. For example, eliminating sewer service extensions onto a barrier island often will result in low-density development.

- a. **A good example of land-use ordinances to reduce disaster effects was recently demonstrated in Florida:** Coastal communities are vulnerable to extensive building damage due to wind forces and storm surges associated with hurricanes. Two of the most effective tools for mitigating damages, land use and building code requirements, were implemented during the 1980s by the State of Florida through its Coastal Construction Control Line (CCCL) regulation. The CCCL defines the zone along the coastline subject to flooding, erosion, and other impacts during a 100-year storm. Properties located seaward of the CCCL are subject to state-enforced elevation and construction requirements. The CCCL foundation, elevation, and wind-load design requirements seaward of the CCCL are more stringent than normal coastal building requirements.

On October 4, 1995, Hurricane Opal struck a portion of the Florida coastline as a Category 3 hurricane with 110-115 miles per hour winds. **During Hurricane Opal, none of the 576 major habitable structures located seaward of the CCCL and permitted by the state under current standards sustained substantial damage. By contrast, 768 of the 1,366 pre-existing major habitable structures seaward of the CCCL sustained substantial damage;** see visual below. [*Electronic Visual 8.6*]



*Visual 8.6 – Map illustrating the better performance of better-designed structures in the high-risk zone (seaward of the CCCL) during the 1995 Hurricane Opal. Credit: FEMA 294.*

### **Objective 8.6 Explain the evolution of disaster management programs in the U.S.**

#### **Requirements:**

The content should be presented as lecture, supplemented with electronic visuals. The instructor is cued as to when the electronic visual files should be presented. The homework assignment, Handout 8.1, should be distributed following this objective.

Handouts Included:

Handout 8.1

Homework Assignment 8.1.

#### **Remarks:**

### **I. The evolution of philosophy in addressing disasters by federal management programs in the U.S. is presented sequentially below:**

- A. Assist victims of disaster losses.** This was the initial focus of U.S. government. The first legislation to deal with disaster relief was the Congressional Act of 1803 in response to aiding victims of a major fire in Portsmouth, New Hampshire.
- B. Control the cause** (if possible). For instance, when scientific research into the causes of floods showed that the construction of levees was insufficient as a method of control, the first steps were made to provide for reforestation and soil

conservation. The Clarke-McNary Act of 1924, the Mississippi Flood Control Act of 1928, and the McSweeney-McNary Act of 1928 were all directed toward that end. In 1935, the Soil Conservation Service was established by the Congress of the U.S. under an act declaring a policy of permanent provision for control and prevention of soil erosion, and for control of floods.

- C. Improve warning for potential victims of impending disasters.** NOAA was formed in 1970, although the agencies that came together at that time, such as the National Weather Service, which provides national weather warnings and forecasts) are among the oldest in the Federal Government,. NOAA's role is to assess and predict environmental changes, protect life and property, provide decision-makers with reliable scientific information, manage the nation's living marine and coastal resources, and foster global environmental stewardship.
- D. Provide insurance for disaster losses.** In 1968, the National Flood Insurance Program (NFIP) was established to protect high-risk flood regions by backing insurance programs that agree to specific standards in reducing flood damage.
- E. Improve response of structures/equipment.** Develop and enforce better building codes (creation of NEHRP program in 1977) and emphasize mitigation (i.e., Disaster Mitigation Act of 2000).
- F. Modify behavior of potential victims.** The current focus of government is toward mitigation, as it is now recognized that growing trend of increasing losses is unsustainable (i.e., Disaster Mitigation Act of 2000 mandates planning). Examples of modifying behavior includes increasing awareness, information and education, imposing construction requirements, restricting the use of hazard-prone land, requiring disclosures in land transactions, providing financial incentives, providing relocation assistance, subsidizing insurance premiums, withholding governmental assistance for disaster recovery, etc.

## **II. Current Disaster Policy, Agencies and Programs.**

- A. Policy Issues:** Policy and the institutional environment for mitigating hazard losses is complex, because policy:
  - 1. Has many forms and sources, and can be difficult to understand.
  - 2. Can be neutral to disaster exposure, but also can encourage or discourage exposure.
  - 3. Can have various contradictory components.
  - 4. Includes a variety of principles such as:

## Session 8: Disaster Phases and Earthquake Policies

- a. Providing assistance to limit suffering and social disruption.
  - b. Controlling hazards.
  - c. Improving understanding and predictability of hazards.
  - d. Making insurance for hazard losses available.
  - e. Recognizing property rights.
  - f. Recognizing the local/state/federal division of powers.
5. Often involves reducing vulnerability to injury and property damage by means such as:
- a. Controlling new development in high-risk areas (land-use ordinances).
  - b. Removing development from high-risk areas.
  - c. Improving performance of structures (building codes, etc.).
  - d. Improving warnings of destructive events.
6. Significant changes are occurring because of skyrocketing costs of natural disasters (i.e., motivation for Disaster Mitigation Act of 2000).

**B.** Primary agencies involved with disasters include:

1. Key federal agencies: (Department of Homeland Security [DHS] and the Federal Emergency Management Agency [FEMA]).
2. State emergency management agencies.
3. Many other private organizations (e.g., the American Red Cross) and governmental units.

### **III. Evolution of Federal Disaster Management Agencies.**

**A.** Individual acts of Congress to provide assistance include:

1. As mentioned earlier, the first official act of Congress for disaster relief was the Congressional Act of 1803 act to assist victims in New Hampshire following an extensive fire.

2. Many individual acts were passed in subsequent years as federal resources were used to fight more than 100 disasters from 1803 to 1950 or so (Brooking, 2004).
3. The last major act related to disasters was the Homeland Security Act of 2002 creating the Department of Homeland Security (DHS).

**B. Creation of major federal disaster agencies.**

1. **Reconstruction Finance Corporation (RFC).** This former U.S. government agency was created in 1932. Its purpose was to facilitate economic activity by lending money during the depression. At first it lent money only to financial, industrial, and agricultural institutions, but the scope of its operations was greatly widened to finance the construction and operation of war plants, make loans to foreign governments, provide protection against war and disaster damages, and other activities.
2. **Office of Emergency Preparedness (OEP).** Emergency preparedness planning functions initially were vested in National Security Resources Board (NSRB), established by the National Security Act of 1947 as an independent agency to advise the President on mobilization coordination. NSRB transferred its functions to the Office of Defense Mobilization (ODM) in the early 1950s. ODM consolidated with the Federal Civil Defense Administration to form Office of Defense and Civilian Mobilization (ODCM), with responsibility for civil defense and emergency mobilization coordination in 1958. ODCM was renamed Office of Civil and Defense Mobilization (OCDM) by an act of August 26, 1958. Civil defense functions of OCDM were transferred to the Office of the Secretary of Defense in 1961. OCDM was re-designated Office of Emergency Planning (OEP) in 1961. OEP coordinated emergency preparedness activities, principally in areas of resource utilization, civil defense, economic stabilization, post-attack rehabilitation, and government organization and continuity. OEP was re-designated as the Office of Emergency Preparedness (OEP) in 1968 (USA&NA, 2004).

The OEP currently is responsible for managing and coordinating federal health, medical, and health-related social services as well as recovery related to major emergencies and federally declared disasters, including natural disasters, technological disasters, major transportation accidents, and terrorism. The OEP now operates under the umbrella of the new Department of Homeland Security as part of the Human Health and Services Agency's Office of Emergency Response.

3. **Federal Disaster Assistance Administration.** This former agency was created in the 1970s and essentially became what is now FEMA.

4. **Federal Insurance Administration.** The Federal Insurance Administration (FIA) administers the National Flood Insurance Program, available nationwide. These programs provide insurance coverage for events that are not covered by traditional homeowner's policies.
5. **By the late 1970s, there were more than 100 agency programs operating within narrow functional areas,** and several duties and tasks were duplicated at the state and local levels – this was a major motivation for the creation of FEMA.
6. **Establishment of Federal Emergency Management Agency (FEMA).**
  - a. Agency was created by Executive Order (President Carter in 1979) to coordinate disaster relief by setting up disaster assistance centers to deliver aid in affected communities.
  - b. Absorbed many independent programs.
  - c. Provides leadership and support in times of disaster, reduces the loss of life and property, and protects the nation from all type of hazards. FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response, and recovery.
  - d. Functions through 2,600 fulltime and 5,000 stand-by employees.
  - e. As discussed below, now one of several agencies under the new Department of Homeland Security.
7. **Department of Homeland Security (DHS).** This agency was created as a post- 9/11 phenomenon. This agency represents the most significant U.S. government transformation since Department of Defense after World War II. It was created by the Homeland Security Act of 2002.
  - a. **Pre-9/11.** More than 100 different government organizations had responsibility for security:
    - 1) Federal Response Plan included all hazards *with terrorism annex* (to describe the policies and procedures with which the government will operate in the event of a terrorist incident).
    - 2) Federal Emergency Management Agency had 12 emergency support functions.

## Session 8: Disaster Phases and Earthquake Policies

- 3) Health and Human Services Agency led for health and medical functions.
- b. **Post-9/11 Homeland Security Department:**
- 1) One department whose primary mission is to protect the American homeland.
  - 2) DHS includes 170,000 workers from 22 different agencies.
- c. DHS missions are to:
- 1) Secure borders, transportation sector, ports, and critical infrastructure.
  - 2) Synthesize and analyze intelligence.
  - 3) Coordinate communication with state and local governments, private industry, and the American people.
  - 4) Train and equip first responders.
- d. Four DHS Directorates:
- 1) Border and Transportation Security.
  - 2) Emergency Preparedness and Response (FEMA).
  - 3) Chemical, Biological, Radiological and Nuclear Countermeasures.
  - 4) Information Analysis and Infrastructure Protection.
- d. Agencies moved under DHS:
- 1) Secret Service Secret Service.
  - 2) Immigration and Naturalization Service (INS).
  - 3) Coast Guard (a uniformed service).
  - 4) Transportation Security Administration (TSA).
  - 5) Federal Emergency Management Agency (FEMA.)
  - 6) HHS Office of Emergency Response (Previously Office of Emergency Preparedness).

- 7) National Disaster Medical System (NDMS).
- 8) Centers for Disease Control and Prevention (CDC).

- C.** Examples of important national earthquake disaster programs and strategies are:
1. Federal disaster response and recovery.
  2. National Mitigation Strategy
  3. National Earthquake Program.
  4. California Earthquake Insurance program.

**IV. Federal Response and Recovery.**

- A.** Requires declaration by the President.
- B.** Includes direct aid to individuals and to governments.
- C.** Includes grants and loans to individuals and governments for property repair and rebuilding.
- D.** Averages \$2.5 billion/year in recent years.

**V. National Mitigation Strategy.**

- A.** Emphasis has shifted from response to reduction of losses by modifying exposure to hazards (mitigation). The motivations for this emphasis are exponentially increasing cost of natural disasters, the increasing risk (i.e., more people and infrastructure becoming concentrated in disaster-prone areas), and the recognition that mitigation is absolutely essential. Framework for federal/state/local/private sector partnerships developed to reduce vulnerability to hazards and to effect a transition from a response mode to an avoidance mode.
- B.** Goals are to increase public awareness of hazards and reduce losses from hazards.
- C.** Mechanisms include information, encouragement, and grants.
- D.** An example of this strategy is “Project Impact,” which focuses on “disaster-resistant” communities.

**VI. Project Impact (former program).**

## Session 8: Disaster Phases and Earthquake Policies

- A. National initiative was launched in 1997, and included more than 300 communities nationwide. Program terminated in 2003.
- B. Federal Emergency Management Agency (FEMA) initiative helped communities protect themselves from the devastating effects of natural disasters.
- C. In each community, different sectors worked to identify potential hazards and minimize the danger they posed.
- D. The goal of Project Impact was to reduce the personal and economic costs of disasters by bringing together community leaders, citizens, and businesses to prepare for, and protect themselves against, natural disasters.
- E. Project Impact based its work and planning on three simple principles:
  1. Preventive actions must be decided upon at the local level.
  2. Private sector participation is vital.
  3. Long-term efforts and investments in prevention measures are essential.

### **VII. Disaster Mitigation Act of 2000.**

- A. Based on FEMA's Project Impact (which is no longer a federal program).
- B. Amends Federal Disaster Relief and Emergency Assistance Act to emphasize mitigation.
- C. Provides technical and financial assistance to state and local government (through Hazard Mitigation Grant Program, etc.).
- D. Restricts federal disaster assistance in cases of previous damage on more than one occasion without mitigation.
- E. Most importantly, **the Mitigation Act of 2000 essentially mandates disaster planning!**

### **VIII. National Earthquake Program (NEP).**

- A. Created in 1996 with FEMA as lead agency to expand the National Earthquake Hazard Reduction Program (NEHRP) in effect since 1977 by:
  1. Enhancing coordination.
  2. Promoting mitigation practices.

3. Transferring technology to state and local governments and the private sector.

**B.** Does not include insurance or regulations.

**IX. California Earthquake Insurance Program.**

- A.** Approved in 1996 in response to crisis in private earthquake insurance market resulting from 1994 Northridge Earthquake.
- B.** Administered by the California Earthquake Authority.
- C.** Claims are covered by the state when funds available to insurance industry from premiums are exceeded.

**X. Earthquake Loss Reduction Act of 2001.**

This act was introduced by Senator Feinstein from California and has not yet been signed into law (2004). If signed into law, this act would:

- A.** Provide a credit against federal income taxes equal to 50% of a homeowner's investment in seismic retrofit, not to exceed \$6,000.
- B.** Allow businesses to depreciate the cost of seismic retrofit over five years.
- C.** Authorize a \$1 billion Loss Reduction Trust Fund to provide matching grants for mitigation measures and recovery planning grants to reduce damage to buildings and utility and transportation systems critical to disaster response. The grants are to be provided to local governments, public and private hospitals, institutions of higher education, and special districts. These require that the state and the local government recipients benefiting from the investment fund a portion of the cost. To be eligible, the local entities also must have in place a long-term strategic earthquake loss reduction plan and enforce land use, building code, and other measures to reduce the vulnerability facilities in the jurisdiction.
- D.** Define a seismic retrofitting bond as a bond for which 95 % of the proceeds are used for seismic retrofitting expenditures or used to finance loans to borrowers for seismic retrofitting expenditures as "qualified bonds."
- E.** Encourage private investments in seismic retrofitting of residential properties by improving tax benefits.
- F.** Encourage lower interest rates on mortgages for seismically-retrofitted residences.

## Session 8: Disaster Phases and Earthquake Policies

- G.** Permanently establish the Advanced Seismic Research and Monitoring System in the U.S. Geological Survey. This will enable researchers to discover ways to predict an earthquake before it strikes.
- H.** The Act was introduced to Congress due to the recognition that:
1. Earthquakes and tsunamis cause great danger to human life and property throughout the United States and continue to threaten Americans significantly in more than 40 states and territories.
  2. Too few states and local communities have sufficiently identified and assessed their risk and implemented adequate measures to reduce losses from such disasters and to ensure that their critical public infrastructure and facilities will continue to function after the disaster.
  3. Too much of the nation's stocks of housing and commercial buildings remain inherently vulnerable to earthquake shaking. Future losses in these facilities can be lessened using currently feasible technology.
  4. Too much of local government infrastructure remain at risk and are likely to be nonfunctional in the aftermath of foreseeable earthquake events at the time when the services they provide are critically necessary.
  5. Federal, state and local government expenditures for disaster assistance and recovery have increased without commensurate reduction in the likelihood of future losses from such earthquakes.
  6. Feasible techniques for reducing future earthquake losses are readily available.
  7. Without economic incentives, it is unlikely that states and local communities and the public will be able to implement available measures to reduce losses and ensure continued functionality of their infrastructure.

*[Instructor note: Handout 8.1- Homework Assignment ]*

### **References Utilized:**

*American Heritage Dictionary of the English Language, 4<sup>th</sup> ed.* 2000. Boston: Houghton Mifflin Company.

Bendimerad, F. 2002. "Megacities, Megarisk." *Prevention Consortium*. Available from: <http://www.proventionconsortium.org/articles/megacities.htm>.

## Session 8: Disaster Phases and Earthquake Policies

- Brookings Institution. 2004. Washington, DC. Data from *Congressional Quarterly Almanac*, Vols., 6-34 Website at <http://www.brook.edu/dybdocroot/GS/CPS/50ge/endeavors/helpvictimsdisaster.htm>
- California Seismic Safety Commission. 2003. *California Seismic Safety Commission Strategic Plan*, adopted June 1998, revised October 2003. [www.seismic.ca.gov](http://www.seismic.ca.gov).
- Church World Service CWS/ACT Emergency Management Training Program. 2004. Training course available at <http://www.cwserp.org/training/CWSEMT/DRmodulea.php>.
- Cox, W. E. 2002. "Mitigation of Losses from Natural Hazards: Policy and Institutions." Course notes from *Natural Hazard CEE4554 – Natural Disaster Mitigation and Recovery*. Virginia Tech, Spring, 2002.
- Encarta Online Encyclopedia. 2004. Data from website at: [http://encarta.msn.com/text\\_761561222\\_\\_\\_5/Flood\\_Control.html](http://encarta.msn.com/text_761561222___5/Flood_Control.html).
- FEMA. 2004. Data and information from website at: <http://www.fema.gov>.
- FEMA. 1998. "Planning for Seismic Rehabilitation: Societal Issues." *FEMA 275*.
- FEMA. [No date]. "Report on the Costs and Benefits of Natural Hazards Mitigation." *FEMA 294A* Available from <http://www.fema.gov/library/lib06c.shtm>
- Mileti, D. 1999.. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Joseph Henry Press.
- Multidisciplinary Center for Earthquake Engineering Research (MCEER). 2000. *Strategic Plan 2000*. See: <http://mceer.buffalo.edu/aboutMCEER/strategicPlan/>.
- Natural Hazards Observer. 1997., "Designing Disasters: Determining Our Future Vulnerability," Volume XXII, Number 1, September, 1997. Available from: <http://www.colorado.edu/hazards/o/septo97/septo97a.htm#Designing>.
- NRC. 2003. *Preventing Earthquake Disasters: The Grand Challenge in Earthquake Engineering: A Research Agenda for the Network for Earthquake Engineering Simulation (NEES)*. National Research Council. Washington, DC: National Academies Press.
- Multidisciplinary Center for Earthquake Engineering Research (MCEER). 2002. *Strategic Plan 2000*. See: <http://mceer.buffalo.edu/aboutMCEER/strategicPlan/>.
- Quarantelli, E. L. 1999. Disaster Research Center, "The Disaster Recovery Process: What We Know And Do Not Know From Research" University Of Delaware, Newark, Delaware; available from <http://www.udel.edu/DRC/preliminary/pp286.pdf>.

## Session 8: Disaster Phases and Earthquake Policies

Quarantelli, E. L.. 1985. *Organizational Behavior in Disasters and Implications for Disaster Planning*. Newark: Disaster Research Center, University of Delaware.

Quarantelli, E. L. 1985. *Research Based Criteria for Evaluating Disaster Planning and Managing*. Newark: Disaster Research Center, University of Delaware.

Sharma, V.K.1999. *Use of GIS related technologies for managing disasters in India: an overview*. New Delhi, India: National Center for Disaster Management, Indian Institute of Public Administration. Report available from:  
[http://www.gisdevelopment.net/application/natural\\_hazards/overview/nho0003.htm](http://www.gisdevelopment.net/application/natural_hazards/overview/nho0003.htm)

Tierney, K. J. 1993. *Disaster Preparedness and Response: Research Findings and Guidance from the Social Science Literature*. Taipei, Taiwan, ROC: U.S.-ROC Workshop on Natural Disaster Reduction.

Tierney, K. J., Lindell, M. K., and R. W. Perry , 2001. *Facing the Unexpected: Disaster Preparedness and Response in the United States*, pp. 157-198. Report can be obtained from: <http://books.nap.edu/catalog/9834.html>.

United Nations. 2004. *Living with Risk: A Global Review of Disaster Reduction Initiatives*. Available from:  
<http://www.e11th-hour.org/public/natural/living.with.risk.html>.

United States Geological Survey (USGS). 1995. *USGS Natural Hazards Programs: Lessons Learned for Reducing Risk*. From: <http://water.usgs.gov/wid/html/HRDS.html>

United States National Archives and Records Administration (USNA & RA). 2004. Data from website at: [http://www.archives.gov/research\\_room/federal\\_records\\_guide/emergency\\_preparedness\\_rg396.html](http://www.archives.gov/research_room/federal_records_guide/emergency_preparedness_rg396.html).