Session No. 10

Course Title: Earthquake Hazard and Emergency Management

Session Title: Earthquake Preparedness

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

Time: 180 minutes

Objectives:

10.1   Identify general principles and activities associated with earthquake preparedness, appreciate its importance, and recognize the link to the other three phases of disaster management.

10.2   Identify general principles associated effective earthquake preparedness.

10.3   Discuss current research findings regarding the benefit of earthquake preparedness and appreciate the difference between effective preparedness and effective management.

10.4   Identify impediments to preparedness and strategies to achieve preparedness objectives.

10.5   Identify the primary factors that determine whether individuals, organization, or agencies, etc. will prepare.

Scope:

The objective of this series of lectures is to introduce the student to the general principals associated with preparedness for earthquake disasters. The instructor should begin by thoroughly discussing what earthquake **preparedness** really is and taking care early-on to clearly distinguish this management phase from other phases such as mitigation. The instructor should provide specific examples (with class feedback and discussion) to make this distinction clear and to ensure that the students can see where and how preparedness fits into the overall disaster management picture. The instructor should refer back to Session 8 (where the four disaster phases are initially presented and discussed) during this discussion and note that some of the material may overlap.

This session also provides information concerning the measures and activities typically involved with preparedness and how such measures affect earthquake disasters. Important guiding principles for effective disaster preparedness, along with preparedness issues associated with

specific entities such as households, organizations, agencies, governments, etc., are presented. Of particular importance, the session gives extensive coverage to the factors that tend to encourage and/or impede preparedness efforts by various entities. This is one of the most important aspects of this topic – understanding the primary factors that determine whether preparedness is occurring and why.

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Readings:

Required student reading:

None.

Suggested student reading:

Tierney, K. J.1993. *Disaster Preparedness and Response: Research Findings and Guidance from the Social Science Literature*. U.S.-ROC Workshop on Natural Disaster Reduction, Taipei, Taiwan, ROC, June 24-26, 1993.

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

Required instructor reading and resources:

Quarantelli, E. L. 1982. "Ten Research Derived Principles of Disaster Planning.- Disaster Management 2: 23-25.

Tierney, K. J.1993. *Disaster Preparedness and Response: Research Findings and Guidance from the Social Science Literature*..U.S-.ROC Workshop on Natural Disaster Reduction, Taipei, Taiwan, ROC, June 24-26, 1993.

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

Additional suggested instructor reading:

California Seismic Safety Commission. 2003. *California Seismic Safety Commission Strategic Plan*, adopted June 1998, Revised October 2003. www.seismic.ca.gov

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Handouts Included:

Handout 10.1 Classroom Discussion Assignment 10.1
Handout 10.2 Homework Assignment 10.1

General Requirements

In addition to the general concepts discussed above, there are a number of specific points to be emphasized by the instructor in this session. First, the purpose of preparedness should be clearly communicated as being **to enhance the ability of social units to respond when a disaster occurs.** Both mitigation and preparedness take place in the pre-disaster context. However, in terms of distinguishing between preparedness and mitigation, it should be emphasized that preparedness is closely associated with **response** – again to improve our ability to respond; whereas mitigation involves measures, actions, policies, and actions to reduce the effect of the disaster. The preparedness process **involves anticipating what problems are likely to emerge in future disaster situations and devising strategies to address those problems**.

Secondly, differences between **preparedness** and **management** should be clearly distinguished and it should be explained that "good disaster preparedness" does not "ensure good disaster management," and vice versa. That is, being well prepared for a disaster, but poorly managing the disaster, results in an overall ineffective process that negates the preparedness efforts. This underscores again the **importance of effective emergency managers**. This also is an excellent time to raise the question: **How much difference does preparedness really make in terms of mitigating disasters? Is it really effective?** We assume that good preparedness results in mitigated disasters, but this is largely a tacit assumption, as little formal research on this specific issue has been performed. For instance, as discussed in Objective 10.3, the 1994 Northridge Earthquake case history basically raises the question as to whether the excellent response to this event was due to good preparedness or effective disaster management, or both.

Thirdly, it is important to stress that **risk perception** is a primary factor in determining who prepares. Researchers have begun to better understand basic issues associated with preparedness. For instance, we are beginning to learn **who** prepares, but we still lack clear knowledge as to **why** certain entities and individuals prepare. It is clear that **risk perception, defined as the perceived likelihood of personal property damage and personal injury, is an important factor in determining whether an individual or entity will prepare (Tierney et al., 2001).** Also, it is known that most people do not "personalize" disasters – instead, they tend to "socialize" disasters – even when they are aware of the hazard. That is, they tend not to think they will be affected even though they may be in harm's way, and it is the people around them they consider potential disaster victims. Lastly, it is vital that the students be made aware of an additional primary factor that determines whether individuals, business, agencies, etc. prepare: **hazard intrusion.** *Hazard intrusion* **refers to how frequently and intrusively the threat of a disaster is presented and communicated to an individual or group (Tierney et al., 2001**). This underscores the need for **continual education and communication to the public and**

relevant groups, even in cases where the threat is generally recognized and/or personalized. The instructor should make reference to upcoming Session 13, Risk Communication that discusses effective ways of communicating risk to the public and the importance of this activity.

A class discussion that should be presented early-on in the lecture, perhaps following Objective 10.1, is included. This assignment is to spur discussion and thinking, and to hear the student's preconceived notions about preparedness. This will enhance the lessons learned later in the session. A homework assignment is provided and should be distributed at the end of the session.

Objective 10.1: Identify general principles and activities associated with earthquake preparedness, appreciate its importance, and recognize the link to the other three phases of disaster management.

Requirements:

The content should be presented as lecture. **The classroom discussion should be presented following this objective as indicated**.

Handouts Included:

Handout 10.1 Classroom Discussion Assignment 10.1

Remarks:

I.   What is Earthquake Disaster Preparedness and Why is it Important?

   A.   Earthquake disaster preparedness: "is the aggregate of measures to be taken in view of earthquake disasters, consisting of plans and action programs designed to minimize loss of life and damage, to organize and facilitate effective rescue and relief, and to rehabilitate after disaster" (CSSC, 2003).

   B.   Preparedness requires the necessary legislation and means to cope with disaster or similar emergency situations. It also is concerned with forecasting and warning, the education and training of the public, organization and management, including plans, training of personnel, the stockpiling of supplies and ensuring the needed funds and other resources.

   C.   Preparedness is one of the four major phases involved with the management of a disaster. As discussed back in Session 8, the management of disasters typically is described as consisting of four phases:

      1.   Mitigation.

      2.   Preparedness.

      3.   Response.

4. Recovery.

D. Both mitigation and preparedness can and should take place in the pre-disaster context. Whereas mitigation is associated with reducing the effects of a disaster; the primary purpose of **preparedness is to enhance the ability of social units to respond** **when a disaster occurs** (Quarantelli, 1982).

E. The preparedness process starts with hazard and vulnerability analysis to anticipate problems so that strategies can be devised to address the problems effectively, and so that the resources needed for an effective response are in place beforehand.

II. **Earthquake Preparedness Typically Involves:**

A. Preparedness includes activities such as formulating, testing, and exercising disaster plans; providing training for disaster responders and the general public; and communicating with the public and others about disaster vulnerability and what to do to reduce it (Tierney, 1993).

1. Development of community training and public awareness, logistical support and communications, basic supply needs, early warning, monitoring.

2. Preparedness takes the form of plans or procedures designed to save lives and to minimize damage when an emergency occurs.

3. Planning, training, and disaster drills are essential elements of preparedness. Activities designed to ensure that when a disaster strikes, appropriate personnel will be able to provide the best response possible.

B. Education obviously is a major component of preparedness.

[***Instructor Note***: *Conduct classroom discussion exercise here using Classroom Discussion Handout 10.1*]

Objective 10.2: Identify general principles associated with effective earthquake preparedness.

Requirements:

The content should be presented as lecture.

Remarks:

I. **Principles of Effective Earthquake Disaster Planning (Tierney, 1993).**

    A. Effective preparedness and response activities help save lives, reduce injuries, limit property damage, and minimize disruption. Thus, preparedness measures are vital to society's ability to survive extreme events over the long term.

    B. To be effective, preparedness activities must be based on correct assumptions about post-disaster needs and on basic principles of human behavior. Research suggests that many response-related problems have their origins in planning that makes incorrect assumptions about how disasters should be managed. Quarantelli (1982) has identified a number of general principles of good disaster planning that can be applied to most (if not all) planning efforts, whether carried out by governments, private-sector organizations, or other social units. Those principles, as presented in Tierney (1993), are summarized below:

        1. **Planning is a continuous process.** Planning does not consist of developing written plans, which are then considered "finished;" rather, it is an ongoing process that involves a continuing effort to assess vulnerability and improve response capability.

        2. **Planning involves attempting to reduce the "unknowns" of the anticipated disaster situation.** No planning effort can anticipate everything that will occur when disaster strikes, but good plans can at least identify expected major problems and attempt to devise solutions. Because everything about a future disaster situation cannot possibly be known, it is impossible to pre-plan every aspect of the response, and flexibility is an absolute necessity.

        3. **Planning aims at evoking appropriate actions. Rather than aiming at a rapid response, planning should emphasize acting correctly – even if that means doing nothing until adequate information is available**. "It is far more important in a disaster to obtain valid information as to what is happening than it is to take immediate actions...Planning, in fact, should help delay impulsive reactions" (Quarantelli, 1982: 23-24).

        4. **Planning should be based on what is likely to happen**. While efforts should focus first on typical and probable disaster scenarios, plans should be based on empirically-grounded assumptions about how members of the public will respond in emergency situations, rather than on "common sense" ideas or myths about disaster behavior. There is considerable continuity between how people behave during non-disaster times and how they behave in disasters. Rather than developing plans that require people to do things differently, planners should take this continuity into account.

5.   **Planning must be based on valid knowledge.** Three kinds of knowledge are critical: knowledge of how people are likely to respond in emergency situations; knowledge of the hazard itself and of associated vulnerabilities; and knowledge concerning the resources needed to respond to the hazard.

6.   **Planning should focus on general principles.** One reason for keeping plans focused on principles is that "a complex and detailed plan is generally forbidding to most potential users and tends to be ignored" (Quarantelli, 1982: 24). A second reason is that, since disaster situations shift and evolve rapidly, no plan can ever hope to cover all contingencies. Responding in a disaster situation always involves unexpected and unanticipated challenges, so plans must allow for flexibility.

7.   **Planning is partly an educational activity**. Good preparedness involves not only the development of plans, but also efforts to ensure that all relevant community or societal sectors are brought into the planning process. The parties involved in the process must be educated on what the hazards are, how the plans will address expected problems, and what their disaster roles will be.

8.   **Planning always has to overcome resistance.** The benefits that can be derived from preparedness activities are not self-evident. Disaster planning always requires some form of change in behavior, and change is often difficult to bring about. Government officials, business officials, and community residents have many priorities other than disaster planning, and societal and community needs are invariably greater than the available resources. Thus, getting preparedness measures developed, adopted, and accepted involves overcoming often quite formidable barriers.

9.   **Planning must be tested**. It is virtually a foregone conclusion that disaster plans that are not rehearsed and exercised will either not be used at all or will fail in an actual disaster situation. All types of coordinated action require rehearsal; this is especially true for the coordination needed following a disaster.

C.   In related work, Quarantelli (1988) discusses other important criteria for disaster planning:

1.   First, planning must recognize that disasters are qualitatively different (rather than merely quantitatively different) from smaller events such as accidents or "routine" emergencies. In contrast with these lesser events, disasters place community systems under extreme stress. Responders face new and different demands,and many more and sometimes unfamiliar organizational actors (e.g., central government agencies, outside relief

agencies) are involved. Consequently, planning for disasters cannot be merely an extension of planning for everyday emergencies.

2.   Secondly, while disaster agents (e.g., floods, earthquakes, landslides, and other natural and technological phenomena) differ from one another and typically require specialized resources, planning efforts should be generic, rather than agent-specific, largely because the same general tasks will need to be planned for regardless of type of disaster. There always will be a need, for example, for caring for the sick and injured, damage assessment, and the provision of shelter to displaced victims, regardless of the cause.

3.   Thirdly, planning is most effective when it is integrated rather than fragmented. That is, rather than having various organizations and governmental entities (medical care organizations, law enforcement agencies, fire agencies, local governments) develop disaster plans on their own, it is far better for these different sectors to engage in collective preparedness efforts. This principle applies not only to the development of formal disaster plans, but also to disaster exercises and training activities. (For related discussions, see Dynes et al., 1981).

II.   Models for Disaster Planning and Response.

A.   U. S. disaster researchers have identified two contrasting approaches to disaster planning, which they term the "command and control" and "emergent human resources" or "problem-solving" models (Tierney, 1993).

B.   The "command and control" model treats disaster management like a military exercise. It assumes that:

1.   In a disaster situation, governmental and other responding agencies must be prepared to go into the disaster setting and take over management and control of the situation – since residents in the affected area will be helpless and overwhelmed.

2.   Disaster response activities are best accomplished through centralized direction, control, and decision-making.

3.   Ideally, in an adequate response, a single person is in charge, and relations among the various responding organizations are arranged hierarchically.

C.   This approach to disaster planning is generally viewed as unrealistic and not borne out by data on how people and organizations actually behave in disaster situations.

Objective 10.3: Discuss current research findings regarding the benefit of earthquake preparedness and appreciate the difference between effective preparedness and effective management.

Requirements:
The content should be presented as lecture.

Remarks:

I.   How Much Difference Does Preparedness Really Make?

      A.   It is **tacitly assumed** that effective preparedness and response activities help save lives, reduce injuries, limit property damage, and minimize disruption. Thus, preparedness measures are vital to society's ability to survive extreme events over the long term.

      B.   In reality, emergency preparedness at both the state and national levels has been seriously understudied. (Tierney et al., 2001)

      C.   The fact that local managers have adapted in disaster events is not necessarily indicative of effective planning. Such results could instead be the result of good improvisation or sheer luck. Or, it could just indicate that everyone knows their roles really well and can adapt to disaster well in short time. (NHO, 2000).

      D.   Also, remember that earthquakes are very destructive, but occur relatively infrequently compared to many other disasters, especially in areas outside of the western US. Thus, the practice and skills associated with preparedness for this specific event are probably less familiar and more prone to "rust" than many other disasters.

      E.   Even if preparedness is good, it does not automatically follow that managing a disaster will be good. Good planning does not automatically translate into good managing (Tierney et al, 2001). Not only does planning not always increase effectiveness, but some disasters are well handled in site of apparent absence of planning, or failure on the part of organizations to employ existing plans.

      F.   **Remember: Earthquake Preparedness is not Earthquake Management.** *Disaster planning* develops general principles and strategies for action during emergencies. *Emergency management* attempts to apply those principles and strategies in the disaster setting. Because disasters always contain elements not anticipated in plans, the actions ultimately taken by managers may not be covered in any plan. The importance of management again **underscores the critical importance of effective emergency managers.**

II.   1994 Northridge, EQ Preparedness Case History – Preparedness vs. Management?

A. We often observe that in well- managed disasters, the disaster-stricken communities had engaged in extensive planning, and we automatically assume that the planning was a major factor in good management.

B. We look less frequently at whether response effectiveness was the result of effective planning, emergency period improvisation, or sheer good luck.

C. In some cases, we may find that planning was not necessarily what made the disaster well-managed. How much variation in response was due to other factors, such as the length of the warning period, the quantity of resources on hand, or even the time of day? For instance in Northridge, we acknowledge that had the event not occurred at 4:30 AM on a national holiday, the responding organization would have faced more severe challenges than the event presented (NHO, 2000).

D. Was the fact that Los Angeles responded so effectively to the event the result of planning or because the problems that developed did not really tax the response system?

III.   **The Earthquake Preparedness Dividend – Case History Y2K**
       [as presented in (NHO, 2000)].

A. Intangibles associated with earthquake preparedness benefit other aspects of readiness and disaster resilience. For instance, preparing for earthquakes leads to more resilience for other emergencies, such as terrorism response.

B. One of the benefits of disaster predictions (particularly those that include a specific time of occurrence, like the Y2K hazard and the Iben Browning earthquake "prediction" in 1990) is that they prompt the endangered population to prepare. As one of our friends stated, "A colleague who was a life-long California resident told me that she now has an earthquake preparedness kit for the first time – her recycled Y2K kit."

C. Even if they later dumped their stored water and feasted on their stockpiled canned goods, families (and especially observant children) who took some advanced precautions learned something from the process. Indeed, smart public officials used the Y2K opportunity to educate the public about preparing for all types of disasters, but how long this level of preparedness will continue is unclear.

D. The preparedness dividend extends beyond the individual level. In preparing for Y2K, government at all levels, nonprofit organizations such as the American Red Cross, and businesses all had to examine both their intra- and inter-organizational plans and systems for dealing with all sorts of problems. Groups that had never

worked together before cooperated and planned together, and all organizations had to inventory and prioritize the systems at risk.

IV.   Earthquake Preparedness Measures and Programs.

    A.   Earthquakes pose significant hazard to life and property. Although earthquakes cannot be prevented, effective measures can be taken to reduce loss of life and damage to property that they cause.

    B.   Remember: Earthquakes strike suddenly, violently, and without warning. Identifying potential hazards ahead of time and advance planning can reduce the dangers of serious injury or loss of life from an earthquake.

V.   Overall Objectives of an Effective Preparedness Program:

    A.   The primary objectives of an effective preparedness program must:

        1.   Increase understanding of the consequences (personal loss, social disruption, and economic impact) that can result from earthquakes.

        2.   Increase understanding of the options for mitigation, and the need to take action.

        3.   Develop a comprehensive approach to preparedness for individuals, business owners, and corporate decision-makers.

Objective 10.4 Identify impediments to preparedness and strategies to achieve preparedness objectives.

Requirements:

The content should be presented as lecture.

Remarks:

I.   Impediments to Preparedness:

    A.   Individual business owners, and corporate decision-makers typically do not fully understand the potential loss of life, property loss, personal dislocation, social disruption, and economic losses resulting from earthquakes. (Tierney et al., 2001; CSSC, 1998).

    B.   Several areas are of concern.

1. Limited awareness of the potential for loss of life and property.

2. A false sense of security based on the assumption that the government will protect against all economic losses.

3. No clear understanding that a problem really exists ("It won't happen to me").

4. An attitude that fails to recognize the need for self-reliance ("Preparedness starts at home") expressing itself instead as "There is nothing I can do about it.

5. Limited knowledge of what to do and how to pay for it.

II. Strategies to Achieve Preparedness Objectives (Tierney, 1993).

A. Increase Understanding of the Potential Impact.

1. Develop an effective program for increasing the understanding of the potential for loss of life, personal dislocation, social disruption, and economic losses.

2. Provide presentation of consistent, focused, in-depth, information to individuals, business owners, and corporate decision-makers on proper earthquake preparedness steps.

B. Develop Comprehensive Approach.

1. Develop a comprehensive approach to cost-effective earthquake loss reduction.

2. Include all aspects of an individual's life, from home to work place, including such areas as personal planning, securing contents and fixtures, building retrofit and the stockpiling of critical supplies.

C. Encourage Individuals to Act.

1. Develop a methodology that will encourage everyone to act and will assist them in their actions.

2, Develop economic and regulatory incentives to facilitate and reward actions that will reduce potential losses.

D. Improve K-12 School Preparedness.

1.   Ensure effective preparedness of K-12 public and private schools, their staffs, students, and facilities. Provide emergency response training for staffs and students.

2.   Minimize nonstructural hazards and stockpile critical supplies.

Objective 10.5 Identify the primary factors that determine whether individuals, organization, or agencies, etc. will prepare.

Requirements:

The content should be presented as lecture. The homework assignment should be distributed following this objective.

Handouts Included:

Handout 10.2 Homework Assignment 10.1

Remarks:

*[**Special Note**: The following is adapted largely from Tierney (1993) and Tierney et al., (2001)].*

I.   Factors That Influence Preparedness.

A.   Preparedness activities of organizations, governments, and people vary with a number of major factors, including risk perception and prior disaster experience, along with social, political, economic, cultural, and institutional issues.

B.   The likelihood to adopt certain preparedness measures is related to time, cost, effort and knowledge required, awareness, perceived effectiveness of the measures, and the extent to which the measures are viewed as having multiple benefits and uses.

C.   Research data on preparedness is incomplete, as few detailed and comprehensive studies have been conducted. In general, researchers have a reasonable idea of who prepares, but not so much why they prepare.

D.   Research findings on preparedness are incomplete and sometimes contradictory.

1.   For instance, prior disaster experience is important, and in general, prior experience engenders higher levels of preparedness (largely because of greater awareness of the effects of the disaster).

       2.   This is especially applicable in cases where the prior experience resulted in damage or harm to the individual or entity.

       3.   However, prior experience also can result in a false sense of security: "We've had our big disaster and so it will be a long time before we have to worry about it again."

       4.   The occurrence of severe disasters do not automatically result in communities preparing, even after a major disaster has occurred.

E.   Risk perception is big factor.

       1.   Risk perception should be defined in terms of individuals' expectations about the probability and severity of disasters. People may be aware of hazard but not "personalize" the risk.

       2.   Research indicates, for instance, that perhaps 80% of citizens in an area might expect an earthquake, but perhaps only 30% feel it will affect them. And even if they expect damage to occur, they expect the damage to be only slight. (Tierney, 1993).

       3.   Personalizing the risk is important – those who have heard, understood, and personalized the risk have a better chance of taking self-protective actions.

F.   The general factors that determine whether individuals prepare are similar to those that affect organizations' preparedness decisions and actions.

G.   Although many factors, such as personalizing the risk, are important, **one of the most important factors in determining whether preparedness measures are taken is *hazard intrusiveness*, defined as the frequency of thinking about, discussing, and receiving information about a hazard** (Tierney, 1993; NHO, 2000). Even though people tend to frequently think about hazards after they occur, the salience of the hazard typically declines sharply in the people's lives due to more daily concerns unless the message is reemphasized continually to them though interaction.

H.   Hazard intrusiveness is created by several factors that increase awareness, especially prior experience and education. **This emphasizes the need, importance, and potential effectiveness of continued risk communication through education and awareness programs.** (See Tierney et al., 2001).

II.   **Household Preparedness:**

A.   Overall, people are doing relatively little to prepare for disasters, as other demands and issues take priority (Mileti, p. 215); many people do not prepare even when they expect a particular hazard to occur.

B.   There is no thorough understanding of the social-psychological processes that determine whether individuals take preparedness measures – basically we understand a fair amount about _who_ prepares, but not necessarily _why_ they prepare (Mileti p. 215).

C.   More research is needed to better understand what types of incentives will motivate individuals to better prepare.

D.   A major impediment to household preparedness is the low salience of disasters in peoples' everyday lives

E.   Factors correlated to propensity for preparedness include ethnic and minority status, gender, language, socioeconomic status, social attachment and relationships, economic resources, age, and physical capacity.

       1.   Those with higher socioeconomic status and who are non-minorities prepare better. Preparedness varies with educational level, income, and other measures of community attachment such as having school-age children, owning a home, being married, etc.

       2.   Preparedness measures are more likely to be undertaken by those who are routinely more attentive to the media (educated white, female), are more concerned about other types of social and environmental threats, have personally experienced disaster damage, are responsible for the safety of school-age children, are linked with the community through long-term residences, home ownership, or high levels of social involvement, and who can afford to take the necessary steps to prepare.

F.   Likelihood to adopt certain preparedness measures is a function of **hazard awareness, perceived effectiveness of preparedness measures, risk perception, prior disaster experience, and the cost, effort, and knowledge required to implement the measures.**

G.   Level of **hazard awareness is a primary factor**. Awareness is related to prior experience, education, and personal contact with friends, relatives, neighbors, and colleagues who were preparing for earthquakes, etc.

       1.   In general, prior experience engenders higher levels of preparedness, largely because of greater awareness and especially if experience resulted in harm.

2.   However, it also can result in false sense of security: We've had our big disaster and so it will be a long time until we have it again, especially if the first disaster did not affect the household. That is, residents who were not affected during the first disaster often assume they won't be affected subsequently, such that "the worse that has happened is the worse that can occur."

H.   A key to raising hazard awareness is effectively communicating risks; risk communication is vitally important (**discussed in Session 13**).

1.   A major key to effective communication is using proper communication channels to get the message out to different segments of a hazard-prone community.

2.   Ineffective risk communication is related to factors such as uncertainty or conflicting opinions in the message(s), perceptions that sources may not be credible, and the fact that risk communication must compete with numerous other types of information that might be more salient to the general public.

3.   Awareness typically is higher following major disaster –"teachable moment."

4.   Individuals are more likely to prepare for disasters if:

a.   The threat of a disaster must be seen as high in the short term, such as when a specific warning or advisory has been issued for a specific region (Shelby Co., TN; Parkfield, CA).

b.   The source disseminating the hazard information must be seen as credible.

c.   The preparedness information must be provided reputedly through different channels and in a form that is easy to recall and use.

I.   **Personalizing** the risk is key.

1.   Risk perception is a big factor; **risk perception is defined as the perceived likelihood of personal property damage and personal injury.**

2.   Most people do not "personalize" disasters, even when they are aware of the hazard. For instance, although individuals in a region might expect an earthquake to occur, most tend to feel that it will not affect them. And

even if damage is expected, most tend to feel the damage to them will be only slight.

3. Personalizing the risk is important however, because there is a better chance of taking self-protective actions. **Those who have heard, understood, and personalized the risk have a better chance of taking self-protective actions**.

J. Although personalizing the risk is important (risk perception*),* hazard experience and intrusiveness are more correlated to preparedness than risk perception. Thus, one of the most important factors that influence whether households prepare is **how consistently (or persistently) they are informed about potential hazards and urged to prepare;** see Lindell and Prater (2000) case history illustrating findings from southern California and western Washington state as an example.

III. Organizations.

A. "Organizations" (as used in the following) refers to governments, business, households, etc.

1. Similar factors that constrain preparedness at the household level also constrain organizations.

2. For organizations, mandates and legal incentives generally can induce preparedness. In fact, formal disaster plans for states, etc. probably would not have become universal without such mandates.

3. Most research on disaster preparedness of organizations has been associated with public-sector organizations, especially those involved in emergency operations, such as local emergency management agencies.

4. Hazard preparedness is a central concern only for a few organizations (i.e., those with direct crisis-relevant missions associated response and recovery).

5. For the majority of organizations, disaster-related issues are peripheral or incidental to organizational goals and priorities. Thus, hazards have a low relevance for most organizations, except when a threat is imminent, and potential disasters must compete with other issues on the agenda.

6. The less an organization sees itself as having important disaster functions, the more difficult it is to stimulate preparedness.

7. In particular, organizations with financial difficulty may not have resources necessary to address the problems.

8.   Waugh (1988) reported that preparedness measures are difficult to implement, typically due one or more of five general impediments:

   a.   The inherent intractable and difficult nature of the disaster problem.

   b.   Lack of clear and measurable performance objectives.

   c.   Insufficient resources.

   d.   Inadequate levels of public and official support.

   e.   Insufficient disaster management expertise and guidance to local communities that higher government levels provide.

B.   Local Emergency Management Agencies (EMAs).

1.   In the U.S., disaster response and preparedness is the primary responsibility of local government; however, emergency management typically is not a priority at this level, and in many cases, resources are easily overwhelmed.

2.   Decades ago, EMAs initially were concerned mainly with civil preparedness issues; role evolved into natural disaster preparedness and response.

3.   EMA disaster preparedness and response have improved considerably during last 25 years; one key has been the professionalization of emergency managers, whose role has increased in visibility and prominence during the last two decades. Most successful managers are entrepreneurial and outward-looking, with ability to maintain an inter-organizational and community-based focus.

4.   EMAs typically are well adapted to local situations and needs, but there is a lack of standardization nationally; EMAs are highly diversified in organization, operations, jurisdiction and responsibilities, relationships with other organizations, and resources.

5.   EMAs also tend to plan internally and have the view that expansion of everyday activities is the way to handle disaster

C.   Four primary factors have been suggested as being important to the success of local EMAs (Wenger at al, 1986):

1. The existence of persistent hazards.

2. Integration of the EMA's operation into the day-to-day activities and structure of local government.

3. Extensive relationships with other community organizations.

4. Visible, tangible outputs to the community, such as the maintenance of an emergency operations center.

D. Typical impediments to the success of EMAs are related to their tendency to:

1. Base disaster plans and scenarios on myths, rather than on accurate knowledge – emphasizes the need for better hazard assessment tools and studies.

2. Focus on written plans rather than on the process (i.e., frequent meetings to discuss hazards, developing inter-organizational networks, and conducting emergency exercises).

3. To emphasize command and control (as opposed to processes and functions).

4. Become lulled into a false sense of confidence based on past successes in response to routine emergencies.

5. Accept the overall low priority of disaster planning as an excuse for inaction.

6. Develop preparedness plans that are fragmented and isolated, rather than integrated across different local organizations and sectors.

IV. Fire, Police, and Medical (EMS providers).

A. Little hard data exists as to the preparedness activities of these groups.

1. Police departments tend to devote few resources to emergency planning, although they may be assigned responsibilities in community-wide disaster plans.

2. Larger police departments are more likely to plan than smaller ones; smaller police departments do not typically devote much time to planning.

3.   When they do plan, police departments tend to plan internally, in isolation.

B.   Most fire departments are involved in crisis-related tasks that extend beyond fire fighting and have improved their preparedness levels.

1.   Fire departments tend to be involved in planning for the provision of emergency medical services.

2.   Although less so than police departments, fire departments still tend to plan internally and not inter-organizationally.

3.   Interactions of fire departments with other organizations tend to be limited in daily activities, and this isolation carries over to their disaster planning.

C.   Police, fire, and EMS groups seem to think disasters can be handled through the expansion of everyday emergency procedures. They tend not to appreciate the qualitative differences between disasters and "everyday" emergencies.

D.   Emergency Medical Service providers include ambulance companies, paramedic units, hospitals, etc.

E.   EMS units also tend to plan in isolation from other organizations.

F.   Lack of cohesive EMS planning stems in part from same problems that plague everyday EMS system, namely conflicts:

1.   Among various professions involved.

2.   Between high- and low-status hospitals.

3.   Between private- and public-sector service providers (Tierney, 1985).

G.   Low levels of EMS preparedness are attributed to a number of factors, including (Auf Her Heide, 1989):

1.   Lack of awareness.

2.   The tendency to underestimate disaster probabilities.

3.   Over-reliance on technological fixes.

4.   Lack of governmental support for preparedness.

5.   Lack of an organized constituency supporting preparedness.

6. Competing priorities, difficulty in sustaining the benefits that derive from preparedness.

7. Iinflated expectations about response capability.

8. Ambiguities about responsibility for preparedness and the prevalence of the "paper plan syndrome."

9. Crisis in health care.

V.   Non-Emergency Government Agencies.

A. Primary considerations associated with preparedness planning among non-emergency organizations are that:

1. Disaster preparedness obviously is not as relevant for these organizations.

2. **Roles of agencies not directly involved in crisis-relevant functions are still very important** because their operations during disasters are often essential in allowing normal government operations to continue.

3. Larger organizations are more likely to have greater resources and greater need for strategic planning, and thus, are more concerned with disaster planning.

4. Level of risk perceived by departmental or organizational managers is a very important factor: **the higher the perceived risks by the decision-makers, the greater the likelihood preparedness actions will be taken.**

5. There are a number of firms and groups that specialize in the training of agencies for disasters; for example: http://www.preparenow.org/sfcard.html.

B. Businesses.

1. Private firms tend to be less than enthusiastic about preparedness.

2. Larger business are more likely to prepare than smaller businesses.

3. Firms that have been in business longer tend to prepare more.

4. Previous disaster experience increases likelihood for preparedness measures.

5.	Firms that own their business property tend to prepare more than those that lease.

6.	When central districts face concentrated disaster damage, such as the Coalinga, CA area during the earthquake there in 1983, and in the Santa Cruz area during the 1989 Loma Prieta Earthquake, communities face many problems, including permanent loss of business, loss of sales and property tax revenues, and the need to finance commercial recovery. Thus, **it is important to know how well businesses are prepared for disasters, as well as how to encourage businesses to undertake preparedness measures.**

## VI.	Communities.

A.	Community and neighborhood preparedness is the most efficient and reliable way to prepare for and respond to a major disaster. Through a series of community meetings with residents, service providers, building managers, administrators, and disaster response agencies, this plan can be been developed to create a coordinated effort of response.

B.	Preparedness can be viewed as a five-phase cycle that consists of raising awareness, conducting vulnerability assessments, improving knowledge about hazards, how to cope with them, and planning and practice.

C.	For communities, preparedness encompasses a broad range of activities involving planning, training, financial, and community education or community involvement components.

1.	Activities of community organizations typically include formulating disaster plans, providing training for responders and the general public, and conducting emergency response drills and exercises. Other measures involved acquiring equipment, facilities, and other material resources that will enable an effective response, and conducting programs to increase public awareness.

2.	Also, it is important that community organizations are able to respond to the needs of victims in a disaster. Preparedness actions include understanding what state and federal programs are available at the time of disaster, planning for situations involving warning and evacuation, establishing emergency record-keeping systems, and developing disaster plans and mutual aid agreements.

D.	Local support for disaster preparedness is relatively low in most communities, and few resources tend to be allocated for such.

E.   The relatively low priority afforded to disaster preparedness tends to be a function of the fact that disasters are relatively infrequent in any given locality.

F.   Community responders tend to overgeneralize from their experiences with other routine emergencies, and the actual magnitude of the disaster commonly is either greatly underestimated or overestimated.

G.   In general, prior experience of a community engenders higher levels of preparedness, largely because of greater awareness, especially if the experience resulted in damage and harm. However, this also can produce a false sense of security, with the attitude of "We've had our big disaster and so it will be a long time until we have it again." Thus, the occurrence of large disasters does not automatically prompt communities to better prepare for future disasters (Tierney, et al., 2001)

H.   Typically, there is too little interorganizational planning among community organizations.

   1.   There are a number of organizational obstacles to the development of coordinated systems of community emergency preparedness. These include the tendency of organizations to seek autonomy, staff commitment to professional ideologies, differences in organizational technologies and resource needs, fears about the loss of organizational identity, concerns about loss of scare resources, the proliferation of organizations and interest groups across political jurisdictions, and perceived differences in the costs and benefits of cooperation. (Tierney et al, 2001).

   2.   The effectiveness of community organizations also are related to their positions within the structure of local government, the resources they have, the priority their management places on preparedness, and the larger organization in which these organizations are embedded.

K.   For any community interested in channeling its efforts toward building an earthquake disaster-resistant community, FEMA recommends a four-step process:

   1.   Build community partnerships; identify and recruit community partners: local government leaders, civic and volunteer groups, businesses, and individual citizens..

   2.   Assess the community's risks for earthquake disasters and vulnerability to those risks..

   3.   Target resources and prioritize actions necessary to reduce the impact of future disasters..

4.   Keep the community focused on objectives, and update citizens and businesses frequently on progress of preparedness measures and the present and future benefits of the measures to the community.

VII. Community Emergency Response Teams (CERTs) Program.
(*adapted from FEMA, 2004*)

A.   In addition to Community Disaster Plans, CERTS also are important elements of Community Preparedness Program.

B.   CERTs are trained to help neighborhoods and communities mitigate disasters during the first 72 hours following a disaster when access by professional emergency response teams might be restricted.

C.   The purpose of CERT training is to provide private citizens with the basic skills they will need to handle virtually all of their own needs and then respond to their neighborhood and community needs in the aftermath of a disaster.

D.   CERT is sponsored by FEMA.

E.   Local government prepares for everyday emergencies. However, during a disaster, the number and scope of incidents can overwhelm conventional emergency services. The CERT program is an all-risk, all-hazard training. This valuable course is designed to help you protect yourself, your family, your neighbors, and your neighborhood in an emergency situation.

F.   CERT is about readiness, people helping people, rescuer safety, and doing the greatest good for the greatest number. CERT is a positive and realistic approach to emergency and disaster situations where citizens initially may be on their own and their actions can make a difference. While people will respond to others in need without the training, one goal of the CERT program is to help them do so effectively and efficiently without placing themselves in unnecessary danger. In the CERT training, citizens learn to:

1.   Manage utilities and put out small fires.

2.   Treat the three medical killers by opening airways, controlling bleeding, and treating for shock.

3.   Provide basic medical aid.

4.   Search for and rescue victims safely.

5.   Organize themselves and spontaneous volunteers to be effective.

6. Collect disaster intelligence to support first responder efforts.

G. The CERT concept was developed and implemented by the Los Angeles City Fire Department (LAFD) in 1985. The Whittier Narrows Earthquake in 1987 underscored the area-wide threat of a major disaster in California. Further, it confirmed the need for training civilians to meet their immediate needs. As a result, the LAFD created the Disaster Preparedness Division with the purpose of training citizens and private and government employees.

H. The CERT course will benefit any citizen who takes it. This individual will be better prepared to respond to and cope with the aftermath of a disaster.

1. Additionally, if a community wants to supplement its response capability after a disaster, civilians can be recruited and trained as neighborhood, business, and government teams that, in essence, will be auxiliary responders.

2. These groups can provide immediate assistance to victims in their area, organize spontaneous volunteers who have not had the training, and collect disaster intelligence that will assist professional responders with prioritization and allocation of resources following a disaster.

3. Since 1993 when this training was made available nationally by FEMA, communities in 28 States and Puerto Rico have conducted CERT training.

VIII. States.

A. States have broad authority and play a key role in preparedness and response, both supporting local jurisdictions and coordinating with the national government.

B. For instance, governors of states must request federal resources before they can become available to localities.

C. States have a number of their own resources, including the National Guard, at their disposal for use in emergencies.

D. States are required to develop their own disaster plans and typically participate in training local responders.

E. States have significant responsibilities for the delivery of emergency services.

F. Location of the emergency management office within governmental structure is one factor related to preparedness effectiveness (office typically located in governor's office, under the state police, as a bureau under the adjutant general,

etc.). Regardless of location within the government, **the relationship of the emergency management office with the governor's office is a major factor** – agencies have a better chance of being effective in cases where they have a good relationship with the governor, and where the governor is concerned about and supportive of disaster management.

G.   There is relatively little research data on state-level disaster preparedness.

H.   State-level earthquake preparedness efforts outside of California are sporadic, although there are 45 states and territories in the United States at moderate to very high risk from earthquakes, and they are located in every region of the country.

I.   Bottom line: **What states do makes a tremendous difference in preparedness activities at the local level**.

IX.   **National Level.**

A.   There are few data on national preparedness activities, as most data comes from case histories that assess impacts of changes of policies.

B.   In the U.S., federal emergency disaster preparedness evolved out of concern for civil defense, especially for nuclear disaster readiness.

C.   National preparedness measures tend to be shaped by dramatic events. For instance, Hurricane Andrew in 1992 prompted better response planning after a delayed and uncoordinated response, although the federal response plan had been developed prior to the event. Clear, focused, coordinated planning is sometimes superceded by political and high-profile events.

D.   Preparedness is influenced by institutional power differentials and by federal and intergovernmental system: federalism, complexity of agencies, responsibilities, legislation, and difficulty of interagency coordination (Tierney et al., 2001).

E.   A number of factors that have made the implementation of federal preparedness difficult include the complexity of the intergovernmental system and poor interagency cooperation (Tierney et al., 2001). The goals and objectives to be pursued at the federal level sometimes are not clearly articulated, the resources are frequently insufficient, and federal preparedness often lacks a strong constituency (Tierney et al., 2001). In fact, most earthquake and hazard measures lack a strong constituency at the federal level (as discussed in the Session 6 Homework using the comments of Dr. Thiele).

[*Distribute Handout 10.2 and Homework Assignment 10.1*]

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