

APPENDIX

SELECT EMERGENCY MANAGEMENT-RELATED TERMS & DEFINITIONS

Course Title: Hazards, Disasters and U.S. Emergency Management: An Introduction

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Note:

This “Select Emergency Management-Related Terms and Definitions” document has been compiled for use in the FEMA Emergency Management Higher Education Project working draft course *Hazards, Disasters and U.S. Emergency Management: An Introduction*. This is not a comprehensive or exhaustive treatment of emergency management terms and definitions. Suggestions for additions are welcome and can be provided to Dr. Blanchard for consideration via email at: wayne.blanchard@dhs.gov.

Acceptable Risk: That level of risk that is sufficiently low that society is comfortable with it. Society does not generally consider expenditure in further reducing such risks justifiable. (Australian National 1994)

Acceptable Risk: Degree of humans and material loss that is perceived as tolerable in actions to minimize disaster risk. (Nimpuno 1998)

Acceptable Risk: Risk tolerance.

Given that the provision of absolute safety is impossible, there is great sense in trying to determine the level of risk which is acceptable for any activity or situation. Thus, when a hazard is being managed, the financial and other resources allocated to the task should theoretically match the degree of threat posed by the hazard, as indicated by the rank of the risk....

One must always specify acceptable *to whom* and that implies a conscious decision based on all the available information....

The 1993 floods in the upper Mississippi river basin had an estimated return period of more than one in 200 years, yet some people who were flooded asserted that this event should now be regarded as an unacceptable risk. Such arguments ignore both the economic and social benefits derived by those communities from their floodplain location over the previous 100

years or so, when few flood losses occurred, and the cost to the taxpayer implied in protecting floodplain basins against a flood of the 1993 magnitude. (**Smith** 1996, 57)

Acceptable Risk: Degree of human and material loss that is perceived by the community or relevant authorities as tolerable in actions to minimize disaster risk. (**U.N.** 1992, 3)

Accident: “The word ‘accidental’ carries with it the connotations of both something that occurs by chance and something non-essential or incidental” (Allinson 1993, 15). “The thesis that ‘accidents will happen’ and that therefore nothing can be done to prevent their occurrence reaches its logical fulfillment in the thesis of Charles Perrow that accidents are so inevitable and therefore non-preventable that we are even justified in calling them ‘normal’” (**Allinson**, p.16).

Accident: “Unintended damaging event, industrial mishap” (**Disaster and Emergency Reference Center** 1998).

Accident: “An unexpected or undesirable event, especially one causing injury to a small number of individuals and/or modest damage to physical structures. Examples would be automotive accidents or damage from lightning striking a house.” (**Drabek** 1996, Session 2, p. 3)

Accident: “...situations in which an occasion can be handled by...emergency organizations. The demands that are made on the community are within the scope of domain responsibility of the usual emergency organizations such as police, fire, medical and health personnel. Such accidents create needs (and damage) which are limited to the accident scene and so few other community facilities are damaged. Thus, the emergency response is delimited in both location and to the range of emergency activities. The primary burden of emergency response falls on those organizations that incorporate clearly deferred emergency responsibility into their domains. When the emergency tasks are completed, there are few vestiges of the accident or lasting effects on the community structure” (**Dynes** 1998, 117).

Accident: “The very language used to describe the [TMI] accident revealed the very diverse perceptions that enter such interpretations. Was it an accident or an incident? A catastrophe or a mishap? A disaster or an event? A technical failure or a simple mechanical breakdown?” (**Nelkin** 1981, 135).

Accident: An event which only requires the response of established organizations – expansion or actions such as going to extra shifts is not called for. (**Quarantelli** 1987, 25)

Accident: “The evidence...suggests that accidents are not the product of divine caprice, nor of a set of random chance events which are not likely to recur, but that they are incidents, created by people, which can be analyzed, and that the lessons learned from that analysis, if implemented, will help to prevent similar events from taking place again.” (**Toft** 1992, 58)

Accident, Technological: “Technological accidents...are almost never understood as the way the world of chance sorts itself out. They provoke outrage rather than acceptance or

resignation. They generate a feeling that the thing ought not have happened, that someone is at fault, that victims deserve not only compassion and compensation but something akin to what lawyers call punitive damages.” (Erikson, 1989, 143)

Acts of God: Natural disasters or freak accidents. (Birkland 1997, 2.)

“When society seems to have formed a consensus that the event was an ‘act of God,’ such as a natural disaster or freak accident, our attention turns to what we can do to help the victims. But when the disaster is the result of human failings – poor design, operator error, ‘corporate greed,’ or ‘government neglect’ – our attention turns to the voluntary acceptance of responsibility for an event or to the more coercive process of fixing blame. Boards of inquiry are formed, legislatures hold hearings, and reports are issued, all in hopes of ‘learning something from this incident’ to ensure that something similar does not happen again or in the case of ‘unavoidable’ disasters, in hopes of improving our preparation for and response to disasters” (Birkland 1997, 2).

Acts of God: A fatalistic “syndrome whereby individuals feel no personal responsibility for hazard response and wish to avoid expenditure on risk reduction” (Smith 1996, 70).

Alert: Advisory that hazard is approaching but is less imminent than implied by warning message. See also “warning”. (U.N. 1992, 3)

Assessment: Survey of a real or potential disaster to estimate the actual or expected damages and to make recommendations for prevention, preparedness and response. (U.N. 1992, 15)

Assessment: Survey of a real or potential disaster to estimate the actual or expected damages and to make recommendations for preparedness, mitigation and relief action. (Reference Center 1998)

Avalanche: Mass of snow and ice falling suddenly down a mountain slope and often taking with it earth, rocks and rubble of every description. (WMO 1992, 66)

Base Flood: A term used in the National Flood Insurance Program to indicate the minimum size flood to be used by a community as a basis for its floodplain management regulations; presently required by regulation to be “that flood which has a one-percent chance of being equaled or exceeded in any given year.” Also known as a 100-year flood or one-percent chance flood.

Beaufort Scale: Numerical scale from 0 to 12, indicating wind force.

0-calm

1-light air

2-light breeze

3-gentle breeze

4-moderate breeze

5-fresh breeze

6-strong breeze

- 7-strong wind
- 8-gale
- 9-strong gale
- 10-storm
- 11-violent storm
- 12-hurricane (Gunn 1990, 376; Reference Center 1998)

Blizzard: Violent winter storm, lasting at least 3 hours, which combines below freezing temperatures and very strong wind laden with blowing snow that reduces visibility to less than 1 km. (WMO 1992, 86)

Calamity: “A massive or extreme catastrophic disaster that extends over time and space.” Notes the Black Death of the 14th century as an example. (Drabek 1996, Session 2, p.4)

Catastrophe: “An event in which a society incurs, or is threatened to incur, such losses to persons and/or property that the entire society is affected and extraordinary resources and skills are required, some of which must come from other nations.

An example would be the 1985 Earthquakes in Mexico City and other Mexican cities. Thousands of people—estimates vary markedly—died and tens of thousands were injured. At least 100,000 building units were damaged; reconstruction costs exceeded five billion dollars (with some estimates running as high as \$10 billion). Over sixty donor nations contributed to the recovery through programs coordinated by the League of Red Cross and Red Crescent Societies.” (Drabek 1996, Session 2, p. 4; citing Russell R. Dynes, E.L. Quarantelli, and Dennis Wenger. 1990. *Individual and Organizational Response to the 1985 Earthquake in Mexico City, Mexico*. Newark, Delaware: Disaster Research Center, University of Delaware)

Catastrophe: “...an event that causes \$25 million or more in insured property losses and affects a significant number of property-casualty policyholders and insurers.” (Insurance Services Office 2000, 2)

Catastrophe: An event of such impact upon a community that new organizations must be created in order to deal with the situation. (Quarantelli 1987, 25)

Catastrophe: “...for a given society might be defined as an event leading to 500 deaths or \$10 million in damages. These figures, however, are arbitrary since levels of impact mean different things to different people in different situations. Furthermore, we cannot ignore the element of scale. It would be a catastrophe for a small community if every building were totally destroyed by flooding (as occurred in 1993 in Valmeyer, Illinois), but at the global scale, it would be an insignificant event if only 350 houses were involved... Similarly, \$10 million in damage to some communities would be devastating..., especially in less wealthy societies, but others would be able to cope relatively easily” (Tobin and Montz 1997, 7).

“...a catastrophe not only disrupts society, but may cause a total breakdown in day-to-day functioning. One aspect of catastrophes, is that most community functions

disappear; there is no immediate leadership, hospitals may be damaged or destroyed, and the damage may be so great and so extensive that survivors have nowhere to turn for help (Quarantelli, 1994).¹ In disaster situations, it is not unusual for survivors to seek help from friends and neighbors, but this cannot happen in catastrophes. In a disaster, society continues to operate and it is common to see scheduled events continue..." **Tobin and Montz** 1997, 31).

Catastrophic Disaster: An event that results in large numbers of deaths and injuries; causes extensive damage or destruction of facilities that provide and sustain human needs; produces an overwhelming demand on State and local response resources and mechanisms; causes a severe long-term effect on general economic activity; and severely affects State, local, and private-sector capabilities to begin and sustain response activities. Note: the Stafford Act provides no definition for this term. (**FEMA** 1992, FRP Appendix B)

Category 1 hurricane: The lowest of five levels of relative hurricane intensity on the Saffir/Simpson hurricane scale. A Category 1 hurricane is defined by winds of 74 to 95 MPH, or a storm surge of 4 to 5 feet above normal. This category normally does not cause real damage to permanent structures, although damage to unanchored mobile homes, shrubbery, and trees can be expected. Also some coastal road flooding and minor pier damage. (**Notification Manual**)

Category 2 hurricane: The second of five levels of relative hurricane intensity on the Saffir/Simpson hurricane scale. A Category 2 hurricane is defined by winds of 96 to 110 MPH, or a storm surge of 6 to 8 feet above normal. This category normally causes some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers can be expected. Coastal and low lying escape routes can be expected to flood 2 to 4 hours before arrival of storm center. Small craft in unprotected anchorages will bread mooring. (**Notification Manual**)

Category 3 hurricane: The third of five levels of relative hurricane intensity on the Saffir/Simpson hurricane scale. A Category 3 hurricane is defined by winds of 111 to 130 MPH, or a storm surge of 9 to 12 feet above normal. This category normally does some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast can be expected to destroy smaller structures, with larger structures damaged by floating debris. Terrain continuously lower than 5 feet above sea level may be flooded inland as far as 6 miles. (**Notification Manual**)

Category 4 hurricane: The fourth of five levels of relative hurricane intensity on the Saffir/Simpson hurricane scale. A Category 4 hurricane is defined by winds of 131 to 155 MPH, or a storm surge of 13 to 18 feet above normal. This category normally causes more extensive curtain wall failures, with some complete roof structure failure on small residences.

¹ E.L. Quarantelli. 1994. *Disaster Stress*. Paper presented at the After Everyone Leaves: Preparing for, Managing and Monitoring Mid- and Long-Term Effects of Large-Scale Disasters Conference, Minneapolis Minnesota.

Major erosion will occur at beach areas. Major damage to lower floors of structures near the shore can be expected. Terrain continuously lower than 10 feet above sea level may be flooded, requiring massive evacuation of residential areas inland as far as 6 miles.

(Notification Manual)

Category 5 hurricane: The severest of five levels of relative hurricane intensity on the Saffir/Simpson hurricane scale. A Category 5 hurricane is defined by winds greater than 155 MPH, or a storm surge greater than 18 feet above normal. This category normally causes complete roof failure on many residential and industrial buildings; some are blown over or away. Major damage to lower floors of all structures located less than 15 feet above sea level and within 500 yards of the shoreline can be expected. Massive evacuation of residential areas on low ground within 5 to 10 miles of the shoreline may be required. **(Notification Manual)**

CHEMTREC: The Chemical Transportation Emergency Center, 24-hour contact number 1-800-424-9300 in CONUS, 202-483-7616 outside the continental United States. A service, sponsored by the chemical industry, which provides two stages of assistance to responders dealing with potentially hazardous materials. First, on receipt of a call providing the name of a chemical judged by the responder to be a potentially hazardous material, CHEMTREC provides immediate advice on the nature of the chemical product and the steps to be taken in handling it. Second, CHEMTREC promptly contacts the shipper of the material involved for more detailed information and on-scene assistance when feasible. **(DOT 1993)**

Civil Defense (CD): All activities and measures designed or undertaken for the following reasons: (a) to minimize the effects upon the civilian population caused by, or which would be caused by, an attack upon the United States or by a natural disaster; (b) to deal with the immediate emergency conditions which would be created by any such attack or natural disaster; and (c) to effectuate emergency repairs to, or the emergency restoration of, vital utilities and facilities destroyed or damaged by any such attack or natural disaster. **(FEMA 1990)**

Civil Defense: The system of measures, usually run by a governmental agency, to protect the civilian population in wartime, to respond to disasters, and to prevent and mitigate the consequences of major emergencies in peacetime. The term “civil defense” is now used increasingly. **(UN 1992, 17)**

Civil Disturbances: Group acts of violence and disorders prejudicial to public law and order within the 50 States, District of Columbia, Commonwealth of Puerto Rico, U.S. possessions and territories, or any political subdivision thereof. As more specifically defined in DoD Directive 3025.12 (Military Support to Civil Authorities), “civil disturbance” includes all domestic conditions requiring the use of Federal Armed Forces. **(Title 32 CFR 185)**

Civil Emergency: Any natural or manmade disaster or emergency that causes or could cause substantial harm to the population or infrastructure. This term can include a “major disaster” or “emergency” as those terms are defined in the Stafford Act, as amended, as well as consequences of an attack or a national security emergency. Under 42 U.S.C. 5121, the terms “major disaster” and “emergency” are defined substantially by action of the President in

declaring that extant circumstances and risks justify his implementation of the legal powers provided by those statutes. (**Title 32 CFR 185**)

Civil Protection: “The phrase ‘civil protection’ has gradually come into use around the world as a term that describes activities which protect civil populations against incidents and disasters (Mauro, 1996). . . . Civil protection has gradually and rather haltingly emerged from the preceding philosophy of civil defense.” (**Alexander**, 2002, 4)

Community Awareness and Emergency Response (CAER): A program developed by the Chemical Manufacturers Association providing guidance for chemical plant managers to assist them in taking the initiative in cooperating with local communities to develop integrated (community/industry) hazardous materials emergency plans. (**FEMA 1990**)

Comprehensive Emergency Management: "Comprehensive Emergency Management means integrating all actors, in all phases of emergency activity, for all types of disasters." (**NGA 1978**, 111)

Comprehensive Emergency Management: "CEM refers to a state's responsibility and unique capability to manage all types of disasters by coordinating wide-ranging actions of numerous agencies. The 'comprehensive' aspect of CEM includes all four phases of disaster activity: mitigation, preparedness, response and recovery for all risks -- attack, man-made, and natural -- in a federal-state-local operating partnership." (**NGA 1978**, 203)

Comprehensive Emergency Management: An integrated approach to the management of emergency programs and activities for all four emergency phases (mitigation, preparedness, response, and recovery), for all types of emergencies and disasters and for all levels of government and the private sector.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): Public Law 96-510, as amended. More popularly known as “Superfund,” CERCLA provides authority for Federal and State governments to respond directly to hazardous substances incidents. (**FEMA 1992**, Appendix C)

Conflict Hazards: War, acts of terrorism, civil unrest, riots, and revolutions.

Consequence: The outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. (**Standards 1995**)

Consequence Analysis: The estimation of the effect of potential hazardous events. (**New South Wales 1989**).

Consequence Management (C^OM): Involves measures to alleviate the damage, loss, hardship, or suffering caused by emergencies. It includes measures to restore essential government services, protect public health and safety, and provide emergency relief to affected governments, businesses, and individuals. (**FEMA, Weapons of Mass Destruction-Nuclear Scenario**)

Consequence Management: “Relative to terrorism incident operations, measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses and individuals affected by the consequences of terrorism.” (FEMA *Disaster Dictionary* 2001, 22; cites Federal Response Plan, “Terrorism Incident Annex.”)

Contingency Planning: “Asking about all the ‘what if’s that might occur in the activities of an organization and the dangers faced in the external environment.” (Lerbinger 1997, 267)

Continuity of Government: All measures that may be taken to ensure the continuity of essential functions of governments in the event of emergency conditions, including line-of-succession for key decision-makers.

Continuity of Government (COG): “The preservation, maintenance, or reconstitution of civil government’s ability to carryout the executive, legislative and judicial processes under the threat or occurrence of any emergency condition that could disrupt such process and services.” (Homeland Defense Journal 2004, 26)

Continuity of Operations (COOP): “The ability to recover and provide services sufficient to meet the minimal needs of users of the system/agency. This ability to continue essential agency functions across a wide spectrum of emergencies will not necessarily limit COG functions.” (Homeland Defense Journal 2004, 26)

Crisis: “...a decisive or critical moment or turning point when things can take a dramatic turn, normally for the worse...” (Allinson 1993, 93; based upon *Webster’s New International Dictionary, Unabridged, 2nd ed.*)

Crisis: Short period of extreme danger, acute emergency. (D&E Reference Center 1998)

Crisis: “Crises involve events and processes that carry severe threat, uncertainty, an unknown outcome, and urgency...Most crises have trigger points so critical as to leave historical marks on nations, groups, and individual lives. Crises are historical points of reference, distinguishing between the past and the present...Crises come in a variety of forms, such as terrorism (New York World Trade Center and Oklahoma bombings), natural disasters (Hurricanes Hugo and Andrew in Florida, the Holland and Bangladesh flood disasters), nuclear plant accidents (Three-Mile Island and Chernobyl), riots (Los Angeles riot and the Paris riot of 1968, or periodic prison riots), business crises, and organizational crises facing life-or-death situations in a time of rapid environmental change...Crises consist of a ‘short chain of events that destroy or drastically weaken’ a condition of equilibrium and the effectiveness of a system or regime within a period of days, weeks, or hours rather than years...Surprises characterize the dynamics of crisis situations...Some crises are processes of events leading to a level of criticality or degree of intensity generally out of control. Crises often have past origins, and diagnosing their original sources can help to understand and manage a particular crisis or lead it to alternative state of condition” (Farazmand 2001, 3-4)

Crisis: "...an event and/or a situation which endangers the established system, the health, life, and property of its members...the term 'crisis' is treated as being separated from...other concepts based on the intensity and scope of influence. The terms *disaster*, *hazard*, *accident*, etc., refer to only one event and/or situation, while *crisis* includes the concepts of natural disasters, man-made/technological disasters, and social disasters." (Kim and Lee 2001, 502)

Crisis: "Crises act as *focusing events*, demanding public attention to a policy failure or problem...A great war, a major depression, or an epidemic may set into motion a number of important changes in public policies." (Nice and Grosse 2001, 55)

Crisis: "...a hard and complicated situation...or a turning point—a decisive crucial time/event, or a time of great danger or trouble with the possibilities of both good and bad outcomes" (Porfiriev 1995, 291-292).

Crisis: "A collective crisis can be conceptualized as having three interrelated features: (1) a threat of some kind, involving something that the group values; (2) when the occasion occurs it is relatively unexpected, being abrupt, at least in social time; and (3) the need to collectively react for otherwise the effects are seen as likely to be even more negative if nothing is done sooner or later..." (Quarantelli 1998, 257).

Crisis: "...a situation that, left unaddressed, will jeopardize the organization's ability to do business." (Ziaukas 2001, 246; citing other sources)

Crisis Management: In the literature that exists so far, the term "crisis management" has been widely employed. But this terminology is ambiguous. "Crisis management" can be taken to refer either to managing a crisis after it has arisen—that is, intervening in a crisis situation—or managing in such a way that a crisis does not arise in the first place. The blanket term "crisis management" is thus a conceptual blanket that covers a multitude of sins. It is best to avoid the usage of such a label, since the inclusion of the word "management" in such a label implies that the process so labeled is envisioned as a *solution* to the problem of crises in general. This, however, is not really the case. At best, so-called crisis management addresses only crises that have already arisen and usually only when such crises have become either imminent or already actualized disasters. (Allinson 1993, 92)

Since "crisis management" is used in the literature to refer for the most part to either how one responds to an existent crisis or how one might anticipate crises and therefore be able to respond to them, crisis management most often connotes crisis intervention management whether after the onset of the disaster or in anticipation of a disaster. In either of these two modes, it is nevertheless a "band-aid" approach since it either comes into effect after the wound or primarily addresses itself to having a band-aid ready to cover the wound immediately so that the wound does not bleed overly much. (Allinson 1993, 93)

Crisis Management: Coordination of actions during acute emergency. (**D&E Reference Center** 1998)

Crisis Management: “Key to crisis management is an accurate and timely diagnosis of the criticality of the problems and the dynamics of events that ensue. This requires knowledge, skills, courageous leadership full of risk-taking ability; and vigilance. Successful crisis management also requires motivation, a sense of urgency, commitment, and creative thinking with a long-term strategic vision. In managing crises, established organizational norms, culture, rules and procedures become major obstacles: administrators and bureaucrats tend to protect themselves by playing a bureaucratic game and hiding behind organizational and legal shelters. A sense of urgency gives way to inertia and organizational sheltering and self-protection by managers and staff alike. . . . Successful crisis management requires: (1) sensing the urgency of the matter; (2) thinking creatively and strategically to solving the crisis; (3) taking bold actions and acting courageously and sincerely; (4) breaking away from the self-protective organizational culture by taking risks and actions that may produce optimum solutions in which there would be no significant losers; and (5) maintaining a continuous presence in the rapidly changing situation with unfolding dramatic events. (**Farazmand** 2001, 4)

Crisis Management(C^{RM}): Involves measures to resolve the hostile situation, investigate, and prepare a criminal case for prosecution under federal law. (**FEMA** 1998)

Crisis Management: “Measures to identify, acquire, and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism.” (**FEMA Disaster Dictionary**, 2001, 26; citing FEMA FRP, “Terrorism Incident Annex”)

Damage Assessment: The process utilized to determine the magnitude of damage and the unmet needs of individuals, businesses, the public sector, and the community caused by a disaster or emergency event.

Damage Classification: Evaluation and recording of damage to structures, facilities, or objects according to three (or more) categories:

1. “Severe Damage” - which precludes further use of the structure, facility, or object for its intended purpose.
2. “Moderate Damage” - or the degree of damage to principal members, which precludes effective use of the structure, facility, or object for its intended purpose, unless major repairs are made short of complete reconstruction.
3. “Light Damage” - such as broken windows, slight damage to roofing and siding, interior partitions blown down, and cracked walls; the damage is not severe enough to preclude use of the installation for the purpose for which it was intended. (**U.N.** 1992, 19)

Declaration: The formal action by the President to make a State eligible for major disaster or emergency assistance under the Robert T. Stafford Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Defense Emergency Response Fund: Established by Public Law 101-165 (1989). That law provides that, “The Fund shall be available for providing reimbursement to currently applicable appropriations of the Department of Defense for supplies and services provided in anticipation of requests from other Federal departments and agencies and from State and local governments for assistance on a reimbursable basis to respond to natural or manmade disasters. The Fund may be used upon a determination by the Secretary of Defense that immediate action is necessary before a formal request for assistance on a reimbursable basis is received.” The Fund is applicable to military support to civil authorities (MSCA) under DoD Directive 3025.1 and to foreign disaster assistance under DoD Directive 5100.46. (32 CFR 185)

Disaster: An event that requires resources beyond the capability of a community and requires a multiple agency response. (Unknown source)

Disaster: The result of a hazard impacting a community. (Unknown source)

Disaster: “For insurance purposes a disaster is defined internationally as an event that causes at least US\$5 million in reimbursable losses.” (Alexander, no date, 4)

Disaster: “The distinction between natural hazards or disasters and their manmade (or technological) counterparts is often difficult to sustain...we are dealing with a physical event which makes an impact on human beings and their environment...a **natural disaster** can be defined as some rapid, instantaneous or profound impact of the natural environment upon the socio-economic system” (Alexander 1993, 4).

Disaster: “The label ‘disaster’ rather than ‘accident’ carries with it not only the implication that...an event...was of extraordinary misfortune...but also the implication that it could (unlike most accidents) have been prevented...disasters are events which fall within our scope of concern to prevent and in principle are events which may be prevented, and that we have a consequent obligation to attempt to prevent them” (Allinson 1993, 168-169).

Disaster: “...Allen Barton characterized disaster as a type of collective stress situation in which ‘many members of a social system fail to receive expected conditions of life from the system’ (1969: 38). For Barton, what distinguishes disasters from other types of collective stress, such as war, is that the sources of disasters are external rather than internal.” (Tierney, Lindell and Perry 2001, 9)

Disaster: “Disasters are fundamentally social phenomena; they involve the intersection of the physical processes of a hazard agent with the local characteristics of everyday life in a place and larger social and economic forces that structure that realm” (Bolin with Stanford 1998, 27).

“Disasters are easily characterized as unfortunate things that happen from time to time to people and their cities. What is missing in this view is any understanding of the

ways that political and economic forces create conditions that result in an earthquake having disastrous impacts for *some* people and communities...

“The disruptions of a disaster can unmask social inequalities and the injustices that accompany them... Too often... disasters become the basis for rebuilding social inequalities and perhaps deepening them, thus setting the stage for the next disaster” (Bolin with Stanford 1998, 2).

“Disasters, from a vulnerability perspective, are understood as bound up in the specific histories and socio-cultural practices of the affected people taken in the context of their political and economic systems” (Bolin with Stanford 1998, 8).

“The value of a vulnerability approach [to the study of hazards and disasters] lies in its openness to cultural specificity, social variability, diversity, contingency, and local agency” (Bolin with Stanford 1998, 20).

“A vulnerability approach [to hazards and disasters] directs attention back to people and the common everyday aspects of their lives that make them more or less likely to be caught up in a disaster” (Bolin with Stanford 1998, 20).

“It is the local struggles and strategies that can provide lessons for dealing with disaster across a range of societal contexts... Too often disaster research proceeds with the ‘view from above’” (Bolin with Stanford 1998, 20).

“Disasters and other environmental problems are too often treated, not as symptoms of more basic political and economic processes, but rather as accidents whose effects can be remedied by sufficient application of technical skill and knowledge” (Bolin with Stanford 1998, 231).

Disaster: “A disaster is... an event associated with the impact of a natural hazard, which leads to increased mortality, illness and/or injury, and destroys or disrupts livelihoods, affecting the people or an area such that they (and/or outsiders) perceive it as being exceptional and requiring external assistance for recovery” (Cannon 1994, 29, fn.2).

“Many people now accept that human activity itself has created the conditions for disaster events. This is partly because of growing awareness that through negligence or inappropriate response, the workings of social systems have made a disaster out of a situation which otherwise might not have been so serious. There has also been a growth in understanding that it is *hazards* that are natural, but that for a hazard to become a disaster it has to affect vulnerable people” (Cannon 1994, 16).

Disaster: “Not every windstorm, earth-tremor, or rush of water is a catastrophe. A catastrophe is known by its works; that is to say, by the occurrence of disaster. So long as the ship rides out the storm, so long as the city resists the earth-shocks, so long as the

levees hold, there is no disaster. It is the collapse of the cultural protections that constitutes the disaster proper” (Carr 1932, 211).

“Carr’s conclusion signifies that disasters are the result of human activities, not of natural or supernatural forces. Disasters are simply the collapse of cultural protections; thus, they are principally man-made. Deductively, mankind is responsible for the consequences of his actions as well as of his omissions” (Dombrowsky 1998, 24-25).

Disaster: “A disaster is an emergency considered severe enough by local government to warrant the response and dedication of resources beyond the normal scope of a single jurisdiction or branch of local government.” (Carroll 2001, 467)

Disaster: “An event, natural or man-made, sudden or progressive, which impacts with such severity that the affected community has to respond by taking exceptional measures.” (Carter 1991)

Disaster: “...a *disaster* is a singular event that results in widespread losses to people, infrastructure, or the environment. Disasters originate from many sources, just as hazards do (natural systems, social systems, technology failures). (Cutter 2001, 3)

Disaster: Calamity beyond the coping capacity of the effected population, triggered by natural or technological hazards or by human action. (D&E Reference Center 1998)

Disaster: “Disasters do not cause effects. The effects are what we call a disaster” (Dombrowsky 1998, 21).

Disaster: “An event in which a community undergoes severe danger and incurs, or is threatened to incur, such losses to persons and/or property that the resources available within the community are exceeded. In disasters, resources from beyond the local jurisdiction, that is State or Federal level, are required to meet the disaster demands.” (Drabek 1996, 2-4)

Disaster: “I argue that disaster is a social, rather than a ‘natural,’ happening. Thus, any effort at disaster reduction involves planning and action by various social units.” (Dynes 1993, 175) And, “...disasters are qualitatively as well as quantitatively different from accidents and everyday emergencies.” (pp. 178-179)

Disaster: “A disaster is a normatively defined occasion in a community when extraordinary efforts are taken to protect and benefit some social resource whose existence is perceived as threatened” (Dynes 1998, 113).

Disaster: Differentiating a disaster from an accident “is the extensiveness of the involvement of organizations and other segments within the community...In a community disaster, the pattern of damage may extend to several different places in the community rather than being focalized as it is within a community accident. Also, a number of community structures, perhaps including those that might house the traditional emergency organizations, might be

damaged or destroyed...The increased involvement of other nonemergency organizations then creates the need for coordination of activity and for new patterns of communication among parts of the community that previously had no reason to communicate” (Dynes 1998, 119).

Disaster: “What is a disaster anyway? In social science usage as well as in everyday speech...it is a sharp and furious eruption of some kind that splinters the silence for one terrible moment and then goes away. A Disaster is an ‘event’ with a distinct beginning and a distinct end, and it is by definition extraordinary – a freak of nature, a perversion of the natural processes of life...the two distinguishing properties of a disaster are, first, that it does a good deal of harm, and, second, that it is sudden, unexpected, acute.” (Erikson 1976, 253)

“...instead of classifying a condition as a *trauma* because it was induced by a disaster, we would classify an event as *disaster* if it had the property of bringing about traumatic reactions. According to the terms of this rule, any event or condition that could be shown to produce trauma on a large scale would have earned a place on the current roster of ‘disasters’.” (Erikson 1976, 254)

Disaster: An occurrence that has resulted in property damage, deaths, and /or injuries to a community. (FEMA 1990, *Definitions and Terms*, Instruction 5000.2)

Disaster: Any event “concentrated in time and space, in which a society of a relatively self-sufficient subdivision of society, undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society is prevented” (Fritz 1961, 655)

Disaster: “...a situation involving damage and/or loss of lives beyond one million German marks and/or 1,000 person killed.” (German insurance industry. Dombrosky’s words (1998, 20))

Disaster: “...such severe interference of the public order and safety that in intervention of the centralized, coordinated disaster protection units is necessary.” (German law. Dombrowsky 1998, 20 citing Seeck 1980, 1)²

Disaster: An “extraordinary situation in which the everyday lives of people are suddenly interrupted and thus protection, nutrition, clothing, housing, medical and social aid or other vital necessities are requested.” (German Red Cross. Dombrowsky 1998, 20, citing Katastrophen-Vorschrift 1988, 2)³

² *Gesetz über den katastrophenschutz in Schlesig-Holsteni (LkatSG) vom 9 Dezember 1974.* Wiesbaden, Germany: Kommunal und Schul-Verlag A. Heinig (in German).

³ *Kasastrophen-Vorschrift (1988)*, Bonn: Deuches Rotesse Kreuz (in German).

Disaster: The result of (1) the impact of external forces, (2) social vulnerability, or (3) uncertainty. (Gilbert, 1991)⁴

Disaster: “the loss of key standpoints in common sense, and difficulty of understanding reality through ordinary mental frameworks” (Gilbert 1995, 238).

Disaster: “The result of a vast ecological breakdown in the relations between man and his environment, a serious and sudden event (or slow, as in drought) on such a scale that the stricken community needs extraordinary efforts to cope with it, often with outside help or international aid.” (Gunn 1990, 374)

Disaster: “Disasters are subjective phenomena. They arise from the behavior of complex systems, are perceived and take place in a specific socio-economic, historical, cultural and chronological context.” (Horlick-Jones and Peters 1991a, 147)

Disaster: “...disasters arise from the exposure of vulnerable populations to hostile environments generated by the failure of complex systems...such systems are made vulnerable to failure by the complex interplay of factors including elements of the political economy environment in which the system is embedded.” (Horlick-Jones and Peters 1991b, 41)

Disaster: Events that “...release repressed anxiety [and constitute a] loss of control of social order” (Horlick-Jones 1995, 305).⁵

Disaster: A disaster is an *event* concentrated in time and space, in which a society or one of its subdivisions undergoes physical harm and social disruption, such that all or some essential functions of the society or subdivision are impaired (Kreps 1995, 256).

Disaster: “Disasters are non-routine events in societies or their larger subdivisions (e.g. regions, communities) that involve social disruption **and** physical harm. Among the key defining properties of such events are (1) length of forewarning, (2) magnitude of impact, (3) scope of impact, and (4) duration of impact” (Kreps 1998, 34).

Disasters: “...disasters are conjunctions of historical happenings and social definitions of physical harm and social disruption” (Kreps 1998, 34).

Disaster: “...consensus-type social crisis occasions wherein demands are exceeding resources and emergent responses may generate social change....the idea of social change

⁴ *Politique et compexite: Les crises sans ennemi*. Grenoble, France: CRISE. (Cited in Porfiriev 1995, 287).

⁵ Tierney, Lindell and Perry (2001, 14) state that “...Horlick-Jones (1995) argued in favor of defining disasters as originating in the fundamental social conditions of late-modern society and as involving disruptions of cultural expectations and the release of existential dread. Such dread or anxiety originates in turn in a loss of faith in the institutions that are supposed to keep risks under control.”

is introduced to correct what is identified as a predisposition to focus on disasters as necessarily dysfunctional” [when there are “winners” as well]. (Summary of “the generic perspective” by **Kroll-Smith and Couch** 1991, 357.)

Disaster: “When viewed from an ecological-symbolic perspective, the real issue is not the quality of the disaster agent per se, but whether or not it significantly alters the relationship between a community, its built, modified or biophysical environments, and how people interpret and experience the changes in those environments” (**Kroll-Smith and Couch** 1991, 361).

Disaster: “...disaster must not be seen like the meteorite that falls out of the sky on an innocent world; the disaster, most often, is anticipated, and on multiple occasions.” (**Lagadec** 1982, 495)

Disaster: “An occurrence or threat of widespread or severe damage, injury, or loss of property resulting from a natural or human-made cause, including, but not limited to, fire, flood, snowstorm, ice storm, tornado, windstorm, wave action, oil spill, water contamination, utility failure, hazardous peacetime radiological incident, major transportation accident, hazardous materials incident, epidemic, air contamination, blight, drought, infestation, explosion, or hostile military action, or paramilitary action, or similar occurrences resulting from terrorist activities, riots, or civil disorders.” (**Michigan EMD** 1998, 5)

Disaster: “Disasters, in contrast to risks and hazards, are singular or interactive hazard events...that have a profound impact on local people or places either in terms of injuries, property damages, loss of life, or environmental impacts” (**Mitchell and Cutter** 1997, 10).

Disaster: “Disasters are the interface between an extreme physical event and a vulnerable population.” (Okeefe et al 1976, 566)

Disaster: “In graphic ways, disasters signal the failure of a society to adapt successfully to certain features of its natural and socially constructed environments in a sustainable fashion” (**Oliver-Smith** 1996, 303).

Disaster: “...a process involving the combination of a potentially destructive agent(s) from the natural, modified and/or constructed environment and a population in a socially and economically produced condition of vulnerability, resulting in a perceived disruption of the customary relative satisfactions of individual and social needs for physical survival, social order and meaning” (**Oliver-Smith** 1998, 186)

“A disaster is made inevitable by the historically produced pattern of vulnerability, evidenced in the location, infrastructure, sociopolitical structure, production patterns, and ideology, that characterize a society. The society’s pattern of vulnerability is an essential element of a disaster. (**Oliver-Smith** 1998, 187).

“...a disaster is at some basic level a social construction, its essence to be found in the organization of communities, rather than in an environmental phenomenon with destructive or disruptive effects for a society” (**Oliver-Smith** 1998, 181).

Disaster: “A major natural disaster, in the sociological sense, can be thought of as a failure of the social systems constituting a community to adapt to an environmental event...It should also be viewed as the failure to develop and distribute, among other things, technology in the form of housing and community infrastructure capable of withstanding such an event” (**Peacock/Ragsdale** 1997, 24).

Disaster: The result of negative social and environmental impacts, state (condition) of collective stress in a community, or a contradiction between the capacity to cope with destructive agents and their negative impacts. (C. **Pelanda**, 1982⁶ according to Porfiriev 1995, 287-288.)

Disaster: “A disaster is a non-routine event that exceeds the capacity of the affected area to respond to it in such a way as to save lives; to preserve property; and to maintain the social, ecological, economic, and political stability of the affected region.” (**Pearce** 2000, Chapter 2, 5)

Disaster: “...a state/condition destabilizing the social system that manifests itself in a malfunctioning or disruption of connections and communications between its elements or social units (communities, social groups and individuals); partial or total destruction/demolition; physical and psychological overloads suffered by some of these elements; thus making it necessary to take extraordinary or emergency countermeasures to reestablish stability” (**Porfiriev** 1995, 291)

Disaster: “Disasters occur when the demands for action exceed the capabilities for response in a crisis situation” (**Quarantelli** 1985, 50).

Disaster: An event in which emergency organizations need to expand and extend themselves (such as going to extra shifts) in order to cope. (**Quarantelli** 1987, 25)

Disaster: “Apparently the word etymologically entered the English language from a work in French (*desastre*), which in turn was a derivation from two Latin words (*dis*, *astro*), which combined meant, roughly, formed on a star. So, in its early usage, the word disaster had reference to unfavorable or negative effects, usually of a personal nature, resulting from a star or a planet...In time, the word disaster was applied more to major physical disturbances such as earthquakes and floods, or what came to be traditionally known as Acts of God. With the spread of more secular and non-religious ideologies, nature was increasingly substituted for the supernatural and the term natural disaster came to the fore” (**Quarantelli** 1987, 8).

⁶ C. Pelanda. 1982. *Disaster and Order: Theoretical Problems in Disaster Research*. Unpublished paper.

Disaster: "...earthquakes are quite harmless until you decide to put millions of people and two trillion dollars in real estate atop scissile fault zones" (**Riesner** 1993, 501).

Disaster: "A situation created by natural and or man-made events, other than war or internal strife which demands total integration and co-ordination, by those responsible for administration of the affected region including: 1. all rescue, relief and life support systems required to meet the needs of the victims, essential transportation and communication systems. 2. repairs to the infrastructure. 3. post-disaster rehabilitation and recovery." (**Ritchie**, et al. 2001, 2)

Disaster: "In the traditional view of disasters, two categories of *conditions* appear to be dominant. Self-evidently, the scourge of God together with social or political negligence have traditionally served as the principle conditions of natural disasters. Gradually, negligence has given way to more specific conditions such as deficiencies in mitigatory policies and preparatory measures" (**Rosenthal** 1998, 148).

"...a great many official investigations as well as public opinion still cling to technical failure or human error as the number one cause of man-made disaster. In determining the conditions of disaster, technical failures often take its place as an appropriate substitute for the act of God, whereas human error reflects the inherent weaknesses of mankind..." (**Rosenthal** 1998, 149).

"...mediation...[creates] a new category of disasters and crises which is characterized by extreme collective stress rather than fatal casualties or significant physical damage" (**Rosenthal** 1998, 157).

Disaster: A Condition or situation of significant destruction, disruption and/or distress to a community. (**Salter** 1997-98, 27)

Disaster: All events which cause at least 100 human deaths, 100 human injuries, or US \$1 million economic damages. (**Sheehan and Hewitt** 1969, p. 20)

Disaster: The occurrence of a sudden or major misfortune which disrupts the basic fabric and normal functioning of a society (or community). An event or series of events which gives rise to casualties and/or damage or loss of property, infrastructure, essential services or means of livelihood on a scale which is beyond the normal capacity of the affected communities to cope with unaided. Disaster is sometimes also used to describe a catastrophic situation in which the normal patterns of life (or eco-systems) have been disrupted and extraordinary, emergency interventions are required to save and preserve human lives and/or the environment. Disasters are frequently categorized according to their perceived causes and speed of impact. A disaster occurs when a disruption reaches such proportions that there are injuries, deaths, or property damage, and when a disruption affects many or all of the community's essential functions, such as water supply, electrical power, roads, and hospitals. Also, people affected by a disaster may need assistance to alleviate their suffering. (**Simeon Institute**)

Disaster: "...a disaster may be seen as 'the realization of hazard', although there is no universally agreed definition of the scale on which loss has to occur in order to qualify as a disaster" (**Smith** 1996, 5).

"Natural disasters...result from the conflict of geophysical processes with people. This interpretation gives humans a central role. First, through location, because it is only when people, their possessions and what they value get in the way of natural processes that a risk of disaster exists. Second, through perception, because humans place subjective judgments on natural processes as part of a general environmental appraisal whenever they settle and use land" (**Smith** 1996, 10).

"...a disaster generally results from the interaction, in time and space, between the physical exposure to a hazardous process and a vulnerable human population" (**Smith** 1996, 22).

Disaster: "...disasters are significant events...The disruption associated with disaster is, by customary standards, non-trivial. Disasters are neither confined to isolated subsystems (a single household) nor are they of fleeting duration...Disasters involve the disruption of important societal routines...If damage could be prevented or reduced through human protective action, then disaster—the physical consequence of the intersection of society and natural forces—would not exist. Disaster is a function of knowledge...When knowledge is adequate, no external force can produce disaster; ships ride out storms, buildings shake but do not collapse in earthquakes, flood levees hold, etc...When knowledge is inadequate, disaster results" (**Stallings** 1998, 128-129).

"Disasters affect entire societies; they are neither trivial nor confined to localized social units. Disasters involve the disruption of everyday routines to the extent that stability is threatened without remedial action. Increasingly significant is the loss of certainty and the undermining of faith in orderliness. The state is a major institution for supplying counter-measures when routines are disrupted" (Stallings 1998, 131).

"...in practice the definition [of disaster] will always have a physical component. The physical properties of events are triggers for disaster researchers..." (**Stallings** 1998, 132).

Disaster: "Disasters are the interface between an extreme physical event and a vulnerable human population." (**Susman** et al, 1983)

Disaster: "catastrophic events that (a) interfere severely with everyday life, disrupt communities, and often cause extensive loss of life and property, (b) overtax local resources, and (c) create problems that continue far longer than those that arise from the normal vicissitudes of life" (**Taylor** 1989, 10).

Disaster: "Disasters originate in the fact that all societies regularly face geophysical, climatological, and technological events that reveal their physical and social vulnerabilities." (**Tierney, Lindell and Perry** 2001, 4)

Disaster: “A *disaster* is usually defined as an event that has a large impact on society” (Tobin and Montz 1997, 6).

Disaster: An event, concentrated in time and space which threatens a society or a relatively self-sufficient subdivision of a society with major unwanted consequences as a result of the collapse of precautions which had hitherto been accepted as adequate. (Turner)

Disaster: “A serious disruption of the functioning of society, causing widespread human, material, or environmental losses which exceed the ability of affected society to cope using only its own resources.” (U.N. Glossary 1992, 21)

Disaster: “A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources.” (U.N. ISDR 2002, 24)

Disaster: A “sudden and extraordinary misfortune” to signify the actual onset of a calamity (Allinson 1993, 93; referring to *Webster’s New International Dictionary, Unabridged, 2nd* edition).

Disaster: “...any happening that causes great harm or damage; serious or sudden misfortune; calamity. Disaster implies great or sudden misfortune that results in loss of life, property, etc. or that is ruinous to an undertaking; calamity suggests a grave misfortune that brings deep distress or sorrow to an individual or to the people at large” (Webster’s *New World Dictionary of the American Language*).

Disaster Agent: “A class or category of phenomena that cause disasters, such as hurricanes, tornadoes, or explosions. Hurricane Andrew is a specific disaster event which reflected one of the classes of disaster agents, that is, hurricanes. Andrew is the disaster, hurricane is the disaster agent.” (Drabek 1996, Session 2, p.6)

Disaster, Ecological: Events “that are caused principally by human beings and that initially affect, in a major way, the earth, its atmosphere, and its flora and fauna.” (Drabek and Hoetmer 1991, xxi)

Disaster Epidemiology: The medical discipline that studies the influence of such factors as the life style, biological constitution and other personal or social determinants on the incidence and distribution of disease as it concerns disasters. (U.N. 1992, 22)

Disaster Management: The entire process of planning and intervention to reduce disasters as well as the response and recovery measures. It is a neglected element of development planning. (D&E Reference Center 1998)

Disaster Management: “Disaster management is the process of forming common objectives and common values in order to encourage participants to plan for and deal with potential and actual disasters.” (Pearce, 2000, Chapter 2, 11)

“A process that assists communities to respond, both pre- and post-disaster, in such a way as to save lives, to preserve property; and to maintain the ecological, economic, and political stability of the impacted region.” (Pearce 2000, Chapter 5, p. 6)

Disaster Management: The body of policy and administrative decisions and operational activities which pertain to the various stages of a disaster at all levels. (UN 1992, 22)

Disaster, Natural: “A natural disaster is a serious disruption to a community or region caused by the impact of a naturally occurring rapid onset event that threatens or causes death, injury or damage to property or the environment and which requires significant and coordinated multi-agency and community response. Such serious disruption can be caused by any one, or a combination, of the following natural hazards: bushfire; earthquake; flood; storm; cyclone; storm surge; landslide; tsunami; meteorite strike; or tornado.” (Australian Government 2002, 1)

Disaster, Natural: “‘Natural’ disasters have more to do with the social, political, and economic aspects of society than they do with the environmental hazards that trigger them. Disasters occur at the interface of vulnerable people and hazardous environments” (Bolin with Stanford 1998, Preface).

Disaster, Natural: “While human actions generally cannot cause an earthquake in the sense of doing something to provoke fault movement, they are often critically involved in the disaster that can follow a seismic event. In that sense then, ‘natural’ is an inappropriate adjective to describe such disasters (Hewitt 1997)⁷” (Bolin with Stanford 1998, 4).

Disaster, Natural: Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, or other catastrophe in any part of the United States which causes, or which may cause, substantial damage or injury to civilian property or persons. (Robert T. Stafford Act, 602)

Disaster, Natural: “In a seeming inversion of what was ‘obvious’ about natural disasters, a view has been developed by such geographers as Hewitt that seeks explanations of disaster primarily in the sociocultural and economic features of the societies that are variously affected by natural forces. Their focus has been to develop an understanding of the social structures and material practices that made people more or less vulnerable to environmental hazards. In this approach, the underlying causes of disaster are to be found not in nature, but in the organization of human societies (Varley 1994⁸)” (Bolin with Stanford 1998, 5).

⁷ K. Hewitt. 1997. *Regions at Risk: A Geographical Introduction to Disasters*. London: Longman.

⁸ A. Varley. 1994. “The Exceptional and the Everyday: Vulnerability Analysis in the International Decade for Natural Disaster Reduction.” In A. Varley (ed.), *Disasters, Development and Environment*. London: Wiley.

Disaster Preparedness Improvement Grant Program (DPIG): Authorized under Section 201 of the Stafford Act. Annual matching awards are provided to States to improve or update their disaster assistance plans and capabilities.

Disaster Reduction: “*Disaster reduction* is the sum of all the actions, which can be undertaken to reduce the vulnerability of a society to natural hazards. The solutions include proper land-use planning, aided by vulnerability mapping, to locate people in safe areas, the adoption of proper building codes in support of disaster resilient engineering, based on local hazard risk assessments, as well as ensuring the control and enforcement of such plans and codes based on economic or other incentives. Sound information and political commitment are the basis of successful disaster reduction measures. This is an ongoing process which is not limited to a singular disaster event. It motivates societies at risk to become engaged in conscious disaster management, beyond traditional response to the impact of natural phenomena. Disaster reduction is multi-sectoral and interdisciplinary in nature and involves a wide variety of interrelated activities at the local, national, regional and international level.” (UNISDR 2001, 3)

Disaster Relief Act of 1974: A Federal statute designed to supplement the efforts of the affected States and local governments in expediting the rendering of assistance, emergency services, and the reconstruction and rehabilitation of devastated areas (PL 93-288), as amended. (FEMA Instruction 5000.2)

Disaster Response: A sum of decisions and actions taken during and after disaster, including immediate relief, rehabilitation, and reconstruction. (U.N. 1992, 3)

Disaster Risk Management: “Disaster risk management and reduction are about looking beyond hazards alone to considering prevailing conditions of vulnerability. It is the social, cultural, economic, and political setting in a country that makes people vulnerable to unfortunate events. The basis of this understanding is simple: the national character and chosen form of governance can be as much of a determinant in understanding the risks in a given country, as are the various social, economic and environmental determinants.” (U.N. ISDR 2002, 27)

Disaster Risk Reduction: “The systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) adverse impact of hazards, within the broad context of sustainable development.” (U.N. ISDR 2002, 25)

Disaster, Technological: “...technological disasters – meaning everything that can go wrong when systems fail, humans err, designs prove faulty, engines misfire, and so on.” (Erikson, 1989, 141)

Disaster, Technological: “Man-made disaster due to a sudden or slow breakdown, technical fault, error, or involuntary or voluntary human act that causes destruction, death, pollution, and environmental damage.” (Gunn 1990, 375)

Disaster, Technological: “Miller and Fowlkes (1984)⁹ have argued that the term ‘technological disaster’ renders such events too impersonal in origin. They believe that such ‘accidents’ are due mainly to the excessive priority given to industrial profits and advocate the term ‘man-made disaster’ to indicate corporate responsibility” (Smith 1997, 14).

Domestic Emergency: “Any natural disaster or other emergency that does not seriously endanger national security, but which is of such a catastrophic nature that it cannot be managed effectively without substantial Federal presence, or which arises within spheres of activity in which there is an established Federal role.” (FEMA *Disaster Dictionary* 2001, 36; cites *Domestic Emergencies Handbook*, US Army Forces Command, March 15, 1999).

Domestic Emergency Support Team (DEST): “Relative to terrorism incident operations, an organization formed by the Federal Bureau of Investigation (FBI) to provide expert advice and assistance to the FBI On-Scene Commander (OSC) related to the capabilities of the DEST agencies and to coordinate follow-on response assets. When deployed, the DEST merges into the existing Joint Operations Center (JOC) structure.” (FEMA *Disaster Dictionary* 2001, 36; cites FEMA FRP, “Terrorism Incident Annex”)

Drought: (1) Prolonged absence or marked deficiency of precipitation. (2) period of abnormally dry weather sufficiently prolonged for the lack of precipitation to cause a serious hydrological imbalance. (WMO 1992, 198)

Ecological Disaster: See, “Disaster, Ecological”

El Niño: An anomalous warming of ocean water resulting from the oscillation of a current in the South Pacific, usually accompanied by heavy rain fall in the coastal region of Peru and Chile, and reduction of rainfall in equatorial Africa and Australia. (U.N. 1992, 26)

Emergency: “An unexpected event which places life and/or property in danger and requires an immediate response through the use of routine community resources and procedures. Examples would be a multi-automobile wreck, especially involving injury or death, and a fire caused by lightning strike which spreads to other buildings.” Emergencies can be handled with local resources. (Drabek 1996, Session 2, p. 3)

Emergency: Any hurricane, tornado, storm, flood, highwater, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, nuclear accident, or other natural or manmade catastrophe in any part of the United States. Any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety or to lessen the threat of a catastrophe in any part of the United States. (FEMA 1990)

⁹ P.Y. Miller and M.R. Fowlkes. 1984 “In Defense of ‘Man-Made’ Disaster.” *Natural Hazards Observer*, Vol. 8, p. 11.

Emergency: “Any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States. The Governor of a State, or the Acting Governor in his/her absence, may request that the President declare an emergency when an incident occurs or threatens to occur in a State which would not qualify under the definition of a major disaster. Assistance authorized by an emergency declaration is limited to immediate and short-term assistance, and may not exceed \$5 million, except when authorized by the FEMA Associate Director for Response and Recovery under certain conditions.” (*FEMA Disaster Dictionary* 2001, 39; cites Robert T Stafford Act 102; 44 CFR 206.2, 206.35; 206.63, 206.66, and 503)

Emergency: “Any event requiring increased coordination or response beyond the routine in order to save lives, protect property, protect the public health and safety, or lessen or avert the threat of a disaster.” (*Michigan EMD* 1998, 6)

Emergency: A more serious situation than an incident, but less serious than a disaster. (*Oxford Canadian Dictionary*, 1998; noted by Pearce 2000, Chapter 2, 2)

Emergency: “...an unexpected occurrence or sudden situation that requires immediate action...It may involve communities (as a disaster does) or individuals (which a disaster does not)...” (*Porfiriev* 1995, 291).

Emergency: An event in which established emergency organizations (such as the American Red Cross or utilities) need to expand their activities. (*Quarantelli* 1987, 25.)

Emergency: An extraordinary situation in which people are unable to meet their basic survival needs, or there are serious and immediate threats to human life and well being. An emergency situation may arise as a result of a disaster, a cumulative process of neglect or environmental degradation, or when a disaster threatens and emergency measures have to be taken to prevent or at least limit the effects of the eventual impact. (*Simeon Institute* 1998)

Emergency: “...a sudden critical juncture demanding immediate remedial action.” (*Terry* 2001, 327)

Emergency: A sudden and usually unforeseen event that calls for immediate measures to minimize its adverse consequences. (*U.N.* 1992, 26)

Emergency Assistance: Assistance which may be made available under an emergency declaration. In general, Federal support to State and local efforts to save lives, protect property and public health and safety, and lessen or avert the threat of a catastrophe. Federal emergency assistance may take the form of coordinating all disaster relief assistance (including voluntary assistance) provided by Federal agencies, private organizations, and State and local governments. Or, the Federal government may provide technical and advisory assistance to affected State and local governments for: the performance of essential community services; issuance of warnings of risks or hazards; public health and safety information, including dissemination of such information; provision of health and safety measures; management,

control, and reduction of immediate threats to public health and safety; debris removal; temporary housing; and distribution of medicine, food, and other consumable supplies. (**Stafford Act**)

Emergency Management: The entire process of planning and intervention for rescue and relief to reduce impact of emergencies as well as the response and recovery measures, to mitigate the significant social, economic and environmental consequences to communities and ultimately to the country, usually through an emergency operation center, EOC. (**Disaster and Emergency Reference Center** 1998)

Emergency Management: The process by which the uncertainties that exist in potentially hazardous situations can be minimized and public safety maximized. The goal is to limit the costs of emergencies or disasters through the implementation of a series of strategies and tactics reflecting the full life cycle of disaster, i.e., preparedness, response, recovery, and mitigation. (**Drabek**1997)

Emergency Management: “Emergency management is the discipline and profession of applying science, technology, planning, and management to deal with extreme events that can injure or kill large numbers of people, do extensive damage to property, and disrupt community life.” (**Drabek and Hoetmer** 1991, xvii).

Emergency Management: “Activities that include prevention, preparedness, response, recovery, rehabilitation, advocacy, and legislation, of emergencies irrespective of their type, size, and location, and whose purpose is reduction in death, disability, damage, and destruction.” (**Dykstra** 2003, 3)

“...improving the livelihoods of individuals, communities and nations by measures required to put a stop to unwarranted deaths, disability, damage, and destruction.” (**Dykstra** 2003, 4)

Emergency Management: Organized analysis, planning, decision-making, and assignment of available resources to mitigate (lessen the effect of or prevent) prepare for, respond to, and recover from the effects of all hazards. The goal of emergency management is to save lives, prevent injuries, and protect property and the environment if an emergency occurs. (**FEMA** 1995, I-6).

Emergency Management: “The process through which America prepares for emergencies and disasters, responds to them, recovers from them, rebuilds, and mitigates their future effects.” (**FEMA Disaster Dictionary** 2001, 40, citing FEMA Strategic Plan)

Emergency Management: “A simple definition is that emergency management is the discipline dealing with risk and risk avoidance.” (**Haddow and Bullock** 2003, 1)

Emergency Management: “A Comprehensive system of policies, practices, and procedures designed to protect people and property from the effects of emergencies or disasters. It includes programs, resources, and capabilities to mitigate against, prepare for, respond to, and recover from effects of all hazards.” (**Michigan DEM** 1998, 6)

Emergency Management: Emergency management refers to “the expert systems that manage people and resources to deal with disasters.” (Rubin 2000, 1)

Emergency Management: A range of measures to manage risks to communities and the environment. It involves the development and maintenance of arrangements to prevent the effect of, prepare for, respond to or recover from events causing significant community disruption or environmental damage. (Salter 1997–98, 28)

Emergency Management: The organization and management of resources for dealing with all aspects of emergencies. Emergency management involves the plans, structures and arrangements which are established to bring together the normal endeavors of government, voluntary and private agencies in a comprehensive and coordinated way to deal with the whole spectrum of emergency needs including prevention, response and recovery. (Victorian Department of Justice 1997)

Emergency Management: “In simplest terms, emergency management is the management of risk so that societies can live with environmental and technical hazards and deal with the disasters that they cause.” (Waugh 2000, 3)

Emergency Manager: The person who has the day-to-day responsibility for emergency management programs and activities. The role is one of coordinating all aspects of a jurisdiction’s mitigation, preparedness, response, and recovery capabilities.

(The local emergency management position is referred to with different titles across the country, such as civil defense coordinator or director, civil preparedness coordinator or director, disaster services director, and emergency services director.)

Emergency Manager: “Emergency managers are professionals who practice the discipline of emergency management by applying science, technology, planning and management techniques to coordinate the activities of a wide array of agencies and organizations dedicated to preventing and responding to extreme events that threaten, disrupt, or destroy lives or property.” (Drabek 2002, Student Handout 1-2)

Emergency Operations Plan (EOP): An all-hazards document that specifies actions to be taken in the event of an emergency or disaster event; identifies authorities, relationships, and the actions to be taken by whom, what, when, and where, based on predetermined assumptions, objectives, and existing capabilities.

Emergency Preparedness: Activities and measures designed or undertaken to prepare for or minimize the effects of a hazard upon the civilian population, to deal with the immediate emergency conditions which would be created by the hazard, and to effectuate emergency repairs to, or the emergency restoration of, vital utilities and facilities destroyed or damaged by the hazard. (Stafford Act)

Emergency Public Information: Information which is disseminated primarily in anticipation of an emergency or at the actual time of an emergency and in addition to providing information as such, frequently directs actions, instructs, and transmits direct orders. (**Simeon Institute** 1998)

Emergency Risk Management: “Emergency risk management is a ‘systematic process that produces a range of measures that contribute to the well-being of communities and the environment’. It includes: context definition; risk identification; risk analysis; risk evaluation; risk treatment; monitoring and reviewing; and, communicating and consulting.” (**Emergency Management Australia** 2000, 1)

Emergency Support Services: The departments of local government that have the capability to respond to emergencies 24 hours a day. They typically include law enforcement, fire, rescue, and public works. They may also be referred to as emergency response personnel or emergency operating forces.

Exposure: “Exposure describes the number of people, and the value of structures and activities that will experience...hazards and may be adversely impacted by them.” (**Darlington and Lambert** 2001, 135)

Exposure: “People, property, systems, or functions at risk of loss exposed to hazards.” (**Multihazard Mitigation Council**, 2002, 30)

Extreme Events: An extreme event in the context of the natural world is an act of nature, “such as a lightning stroke or a flood [that] may be a productive resource and a hazard at the same time. Lightning may kill an animal but also start a fire essential to the preservation of a forest ecosystem. A flood may destroy a farmstead while fertilizing the fields” (**Burton et al.** 1993, 34).

Federal Radiological Emergency Response Plan (FRERP): The plan used by Federal agencies to respond to a radiological emergency, with or without a Stafford Act declaration. Without a Stafford Act declaration, Federal agencies respond to radiological emergencies using the FRERP, each agency in accordance with existing statutory authorities and funding resources. The Lead Federal Agency has responsibility for coordination of the overall Federal response to the emergency. FEMA is responsible for coordinating non-radiological support using the structure of the Federal Response Plan. When a major disaster or emergency is declared under the Stafford Act and an associated radiological emergency exists, the functions and responsibilities of the FRERP remain the same. The Lead Federal Agency coordinates the management of the radiological response with the Federal Coordinating Officer. Although the direction of the radiological response remains the same with the Lead Federal Agency, the FCO has the overall responsibility for coordination of Federal assistance in support of State and local governments using the Federal Response Plan. (FRERP)

Federal Response Plan (FRP): 1) The plan designed to address the consequences of any disaster or emergency situation in which there is a need for Federal assistance under the authorities of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C.

5121 et seq. 2) The FRP is the Federal government's plan of action for assisting affected States and local jurisdictions in the event of a major disaster or emergency. As the implementing document for the Stafford Act, the FRP organizes the Federal response by grouping potential response requirements into 12 functional categories, called Emergency Support Functions. The FRP was completed in April 1992, and 29 Federal departments and agencies are signatories to the plan. (FRERP)

FIRM: Flood Insurance Rate Map

Five-Hundred Year Floodplain (or 0.2 percent chance floodplain): That area which includes the base floodplain which is subject to inundation from a flood having a 0.2 percent chance of being equaled or exceeded in any given year.

Flash Flood: A flood that crests in a short period of time and is often characterized by high velocity flow—often the result of heavy rainfall in a localized area.

Flood Fringe: Areas outside the regulatory floodway but still inundated by the designated one percent annual chance flood (often referred to as the floodway fringe).

Flood of Record: The highest flood historically recorded in a given location. [The U.S. Army Corps of Engineers typically uses the flood of record to determine risk when constructing dams, dikes and levees, etc.]

Floodplain: Low lands adjoining the channel of a river, stream, or watercourse, or ocean, lake or other body of water, which have been or may be inundated by floodwater, and those other areas subject to flooding.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without causing any cumulative increase in the water surface elevation. The floodway is intended to carry the dangerous and fast-moving water.

Forecast: Statement or statistical estimate of the occurrence of a future event. This term is used with different meanings in different disciplines, as well as “prediction”. (U.N. 1992, 4)

The Four Phases: Mitigation, Preparedness, Response and Recovery.

Fujita-Pearson Scale (FPP Scale): A 3-digit scale for tornadoes devised by Fujita (F scale) and Pearson (PP scale) to indicate the tornado intensity (0-5), path length (0-5), and path width (0-7) (WMO 1992).

Fujita Tornado Scale: A scale for expressing the relative intensity of tornadoes, consisting of six levels corresponding to increasing levels of damage - light, moderate, considerable, severe, devastating, incredible. (**Notification Manual**)

Gale: Wind with a speed between 34 and 40 knots. (U.N. 1992)

Geographic Information System (GIS): A computerised database for the capture, storage, analysis and display of locationally defined information. Commonly, a GIS portrays a portion of the earth's surface in the form of a map on which this information is overlaid. (EM Australia 1995)

Hazard: "A Hazard is a natural, technological or social phenomenon that poses a threat to people and their surroundings (in terms of both the natural and the built environment)." (Alexander, No Date, 1)

Hazard: Some, including not just a few emergency managers, view hazards such as earthquakes as "technical problems suitable for a combination of engineering, planning, and specialized managerial solutions, and people, if they are mentioned at all, are seen largely as impediments to carrying out the technocratic solutions, because they fail to see the risks they face (e.g. Mileti and Fitzpatrick 1993)...However, by concentrating on the physical risks, projected extreme events, and worst case scenarios, much is ignored" (Bolin with Stanford 1998, 20).

Hazard: "...natural and social systems interact to produce a hazard..." (Burton et al. 1993, 24).

"Hazards always result from interaction of physical and human systems. To treat them as though they were wholly climatic or geologic or political or economic is to risk omission of components that must be taken into account if sound solutions for them are to be found" (Burton et al. 1993, 188).

"...nature is neutral, and...the environment event becomes hazardous only when it intersects with man. The event leads to disaster when (1) it is extreme in magnitude, (2) the population is very great, or (3) the human-use system is particularly vulnerable" (Burton et al. 1993, 232).

Hazard: "is a source of risk and refers to a substance or action that can cause harm." (Cohrssen & Covello 1989)

Hazard: A broad concept "that incorporates the probability of the event happening, but also includes the impact or magnitude of the event on society and the environment, as well as the sociopolitical contexts within which these take place. Hazards are the threats to people and the things they value, whereas risks are measures of the threat of the hazards..." (Cutter 1993, 2).

Hazard: "A *hazard*, in the broadest term, is a threat to people and the things they value. Hazards have a potentiality to them (they could happen), but they also include the actual impact of an event on people or places. Hazards arise from the interaction between social, technological, and natural systems." (Cutter 2001, 2)

Hazard: "Hazard refers to an extreme natural event that poses risks to human settlements"

(Deyle, French, Olshansky, and Paterson 1998, 121).

Hazard: Dangerous natural or man made phenomenon that expose a vulnerable location to disastrous events. Vulnerability reduction aims at neutralizing the dangers posed by the hazard. (D&E Reference Center 1998)

Hazard: A condition with the potential for harm to the community or environment. Many use the terms “hazard” and “disaster agent” interchangeably. Hence, they will refer to “the hurricane hazard” or even more broadly to “natural hazards” which includes hurricanes, tornadoes, earthquakes and other natural phenomena that have the potential for harm. The hazard is the *potential*, the disaster is the actual event. (Drabek 1997)

Hazard: “Hazard means an event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm or loss” (FEMA 1997, xxi).

Hazard: “Relevant to emergency preparedness, a hazard is an emergency or disaster resulting from a natural disaster, or an accidental or man-caused event.” (FEMA *Disaster Dictionary* 2001, 58, citing Robert T. Stafford Act, 602)

Hazard: “The probability of the occurrence of a disaster caused by a natural phenomenon (earthquake, cyclone), by failure of manmade sources of energy (nuclear reactor, industrial explosion), or uncontrolled human activity (overgrazing, heavy traffic, conflicts) – UNDR0. Some authors use the term in a broader sense, including vulnerability, elements at risk, and the consequence of risk.” (Gunn 1990, 374)

Hazard: Hazards “are threats to humans and what they value: life, well-being, material goods, and environment.” (Harriss et al, 1978)

Hazard: “...a potential source of harm.” (International Standards Organization 1990)

Hazard: Hazard is the probability that in a given period in a given area, an extreme potentially damaging natural phenomena occurs that induces air, earth or water movements, which affect a given zone. The magnitude of the phenomenon, the probability of its occurrence and the extent of its magnitude can vary and, in some cases, be determined. (Maskrey 1989, 1)

Hazard: “A dangerous event or circumstance that has the potential to lead to an emergency or disaster. Any physical phenomenon that has the potential to produce harm or other undesirable consequences to some person or thing.” (May, p. 5)

Hazard: “Hazard...reflects a potential threat to humans as well as the impact of an event on society and the environment...hazards are...in part socially constructed by people’s perceptions and their experiences. Moreover, people contribute to, exacerbate, and modify hazards. Thus, hazards can vary by culture, gender, race, socioeconomic status, and political structure as well” (Mitchell and Cutter 1997, 9-10).

Hazard: “A hazard can be defined as: ‘some aspect of the physical environment that threatens the well-being on individuals and their society.’” (Nigg 1996, 4)

Hazard: “...we describe *hazard* as the forces, conditions, technologies that carry a potential for social, infrastructural, or environmental damage. A hazard can be a hurricane, earthquake, or avalanche; it can also be a nuclear facility or a socioeconomic practice, such as using pesticides. The issue of hazard further incorporates the way a society perceives the danger or dangers, either environmental and/or technological, that it faces and the ways it allows the danger to enter its calculation of risk.” (Oliver-Smith and Hoffman 2002, 4)

Hazard: “In disaster management, a hazard refers to the potential for a disaster.” (Pearce 2000, Chapter 2, 12)

Hazard: A rare or extreme event in the natural or man-made environment that adversely affects human life, property or activity to the extent of causing disaster. A hazard is a natural or man-made phenomenon which may cause physical damage, economic losses, or threaten human life and well-being if it occurs in an area of human settlement, agricultural, or industrial activity. Note, however, that in engineering, the term is used in a more specific, mathematical sense to mean the probability of the occurrence, within a specified period of time and a given area, of a particular, potentially damaging phenomenon of a given severity/intensity. (Simeon Institute 1998)

Hazard: *Hazard* is best viewed as a naturally occurring or human-induced process or event with the potential to create loss, i.e. a general source of danger. *Risk* is the actual exposure of something of human value to a hazard and is often regarded as the combination of probability and loss. Thus, we may define hazard (or cause) as ‘a potential threat to humans and their welfare’ and risk (or consequence) as ‘the probability of a specific hazard occurrence’. The distinction was illustrated by Okrent (1980)¹⁰ who considered two people crossing an ocean, one in a liner and the other in a rowing boat. The main hazard (deep water and large waves) is the same in both cases but the risk (probability of drowning) is very much greater for the person in the rowing boat. Thus while an earthquake hazard can exist in an uninhabited region, an earthquake risk can occur only in an area where people and their possessions exist. People, and what they value, are the essential point of reference for all risk assessment and for all disasters” (Smith 1996, 5).

Hazard: A threatening event, or the probability of occurrence of a potentially damaging phenomenon within a given time period and area. (U.N. 1992, 4)

Hazard: “A potentially damaging physical event, phenomenon or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.” (U.N. ISDR 2002, 24)

¹⁰ D. Okrent. “Comment on Societal Risk.” *Science*, Vol. 208, 1980, pp. 372-375.

Hazard (Environmental): "...the threat potential posed to man or nature by events originating in, or transmitted by, the natural or built environment" (**Kates** 1978, 14).

Keith Smith's (1997, 14-15) commentary on this definition:

"This definition can include both long-term environmental deterioration (acidification of soils, build-up of atmospheric carbon dioxide) and all the social hazards, both involuntary and communal (crime, terrorism, warfare), as well as voluntary and personal hazards (drug abuse, mountain climbing). These hazards have such different origins and impacts that a more focused definition is required."

Hazard (Environmental): "events which directly threaten human life and property by means of acute physical or chemical trauma...Any manageable definition of environmental hazards will be both arbitrary and contentious. But, despite their diverse sources, most disasters have a number of common features:

1. The origin of the damaging process or event is clear and produces characteristic threats to human life or well-being, e.g. a flood causes death by drowning.
2. The warning time is normally short, i.e. the hazards are often known as rapid-onset events. This means that they can be unexpected even though they occur within a known hazard zone, such as the floodplain of a small river basin.
3. Most of the direct losses, whether to life or property, are suffered fairly shortly after the event, i.e., within days or weeks.
4. The exposure to hazard, or assumed risk, is largely involuntary, normally due to the location of people in a hazardous area, e.g. the unplanned expansion of some Third World cities onto unstable hillslopes.
5. The resulting disaster occurs with an intensity that justifies an emergency response, i.e. the provision of specialist aid to the victims. The scale of response can vary from local to international" (**Smith** 1996, 15-16).

Hazard (Environmental): "...extreme geophysical events, biological processes and major technological accidents, characterized by concentrated releases of energy or materials, which pose a largely unexpected threat to human life and can cause significant damage to goods and the environment" (**Smith** 1996, 16).

Hazard (Global): "...changes to regional ecosystems which in turn effect global systems, are termed 'global hazards'. Climate change, soil degradation, and deforestation are examples of global hazards that are directly and indirectly related to the manipulation of technology. Global hazards can be distinguished from the more traditional ones because of their diffused or dispersed effects at the planetary scale—they threaten the long-term survival of the planet...They are not rare, discrete events but develop over a long period of time. Global hazards are cumulative in nature and are the end result of centuries or decades of human manipulation of technology to control nature and exploit its resources" (**Cutter** 1993, 5).

Hazard (Intentional): "Human actions with intent to cause harm to other humans and what they value are termed intentional hazards. Today, terrorism is the source of most of the

intentional hazards.” (**Dymon**, Ute. “Session 1, Introduction to and Evolution of Hazard Mapping and Modeling.” *Hazard Mapping and Modeling* (Draft FEMA Emergency Management Higher Education Project College Course). Emmitsburg, MD: Emergency Management Institute, FEMA/DHS, 2004.)

Hazard (Natural): “...a naturally occurring or man-made geologic condition of phenomenon that presents a risk or is a potential danger to life or property” (**American Geological Institute** 1984). (Quoted in Tobin and Montz 1997, 9).

Hazard (Natural): “The concept of natural hazards is somewhat paradoxical; the elements of a natural geophysical event (e.g., wind and storm surge of a hurricane) are hazardous only when they prove detrimental to human activity systems” (**Baker** 1976, 1).

Hazard (Natural): “While some hazards, such as earthquakes and volcanoes, are the product of natural processes unmodified by human interventions, other ostensibly natural hazards are less and less ‘natural’. The impacts of human activities on global climatic systems, with attendant changes in rainfall patterns, storm frequency, and storm severity suggest that meteorological hazards themselves could be influenced by (unintended) human factors (e.g. Southwick 1996¹¹; Flavin 1997¹²). Flavin (1997) cites evidence that both the frequency and severity of meteorological hazards may be increasing as a result of human-induced climatic change. Similarly human modifications of riverine systems, from deforesting and paving watersheds to elaborate levee systems, have taken the ‘natural’ out of many flood hazards (e.g. Smith 1996)” (**Bolin with Stanford** 1998, 25 fn. 3).

Hazard (Natural): “In reality, the environment is neither benign nor hostile. In is ‘neutral’ and it is only human location, actions and perceptions which identify resources and hazards within the range of natural events (**Burton** et al. 1993)” (Smith 1996, 12).

Hazard (Natural): “...those elements of the physical environment harmful to man and caused by forces extraneous to him” (Smith 1996, 9: quoting I. **Burton and R.W. Kates**. “The Perception of Natural Hazards in Resource Management.” *Natural Resources Journal*, Vol.3, 1964, pp. 412-441).

Hazard (Natural): “Natural hazards exist with or without the presence of human populations and development” (**Schwab**, et al. 1998, 12).

Hazard (Natural): “A natural hazard represents the potential interaction between humans and extreme natural events...It represents the potential or likelihood of an event (it is not the event itself)” (**Tobin & Montz** 1997, 5).

¹¹ C. Southwick. *Global Ecology in Human Perspective*. NY: Oxford University Press, 1996.

¹² C. Flavin. “Climate Change and Storm Damage: The Insurance Costs Keep Rising.” *World Watch*, Vol. 10, No. 1, 1997, pp. 10-11.

“Natural hazards constitute a complex web of physical and environmental factors interacting with the social, economic, and political realities of society” (**Tobin and Montz** 1997, 11).

Hazard (Natural): Naturally caused events such as hurricanes, tornadoes, earthquakes, floods, volcanoes and forest fires. (**Unknown source**)

Hazard (Natural): “First, the misunderstanding of ‘natural hazards’ as events unrelated to or separate from human activity and human choice is no longer credible. The fundamental involvement of human organizations, cultural and institutional context, and political-economic structures cannot be overlooked or wished away. The creation, distribution, and mitigation of vulnerability to hazards of all kinds is a social interaction with either other social processes or geophysical processes or both. There is no purely ‘natural’ hazard in the full sense of a risk or danger for which affected persons have no defence or remedy.” (**Weiner** 2001, 1)

Hazard (Technological): Typically man-related hazards such as nuclear power plant accidents, industrial plant explosions, aircraft crashes, dam breaks, mine cave-ins, pipeline explosions and hazardous material accidents. (**Unknown source**)

Hazard (Technological): “...the interaction between technology, society, and the environment” (**Cutter** 1993, 2).

“Technological hazards arise from our individual and collective use of technology” (**Cutter** 1993, 1).

“The elements of complexity, surprise, and interdependence are governing characteristics of technological hazards” (**Cutter** 1993, 2).

Hazard (Technological): “A Technological hazard arises from the potential of negative consequences resulting from the human use of technology.” (**Dymon**, Ute. “Session 1, Introduction to and Evolution of Hazard Mapping and Modeling.” *Hazard Mapping and Modeling* (Draft FEMA Emergency Management Higher Education Project College Course). Emmitsburg, MD: Emergency Management Institute, FEMA/DHS, 2004.

Hazard (Technological): A range of hazards emanating from the manufacture, transportation, and use of such substances as radioactive materials, chemicals, explosives, flammables, agricultural pesticides, herbicides, and disease agents; oil spills on land, coastal waters, or inland water systems; and debris from space. (**FEMA** 1992, FRP Appendix B)

Hazard (Technological): Technological hazards are best seen as accidental failures of design or management affecting large-scale structures, transport systems or industrial activities which present life-threatening risks to the local community...the failure “trigger” which provokes a technological disaster is likely to arise for one of the following reasons: (1) defective design; (2) inadequate management; (3) sabotage or terrorism (**Smith** 1996, 316).

Hazard Analysis: Involves identifying all of the hazards that potentially threaten a jurisdiction and analyzing them in the context of the jurisdiction to determine the degree of threat that is posed by each. (FEMA 1997)

Hazard Analysis: “A hazards analysis consists of two parts. The first involves knowledge of the kinds of hazards that might threaten the community. This knowledge includes the probability of the event occurring at varying levels of intensity and at varying locations throughout the community. Determinations of probability, intensity, and location can be made on the basis of historical evidence, empirical research, or community perception.” (McLoughlin 1985, 168)

Hazard Analysis: “The identification and evaluation of all hazards that potentially threaten a jurisdiction to determine the degree of threat that is posed by each.” (Michigan DEM 1998, 6)

Hazard Analysis: That part of the overall planning process which identifies and describes hazards and their effects upon the community. (NDO 1992)

Hazard Assessment: Identification of hazards in given location. (D&E Reference Center 1998)

Hazard Assessment: (Sometimes Hazard Analysis/Evaluation) The process of estimating, for defined areas, the probabilities of the occurrence of potentially-damaging phenomenon of given magnitudes within a specified period of time. Hazard assessment involves analysis of formal and informal historical records, and skilled interpretation of existing topographical graphical, geological geomorphological, hydrological, and land-use maps. (Simeon Institute 1998)

Hazard Identification: A structured approach for identifying those hazards judged by local officials to pose a significant threat to their jurisdiction.

Hazard Identification: ...defines the magnitudes (intensities) and associated probabilities (likelihoods) of natural hazard that may pose threats to human interests in specific geographic areas. (Deyle, French, Olshansky and Patterson 1998, 121).

Hazard Identification: “...the process of defining and describing a hazard, including its physical characteristics, magnitude and severity, probability and frequency, causative factors, and locations/areas affected” (FEMA 1997, *Multi Hazard...Assessment*, xxi).

Hazard Identification: Hazard Identification locates hazardous areas, often estimates the probability of hazardous events of various magnitudes, and sometimes assesses the separate characteristics of the hazards (e.g., for hurricanes: wind, high water, and wave action). (Godschalk, Kaiser, and Berke, 1998, 98)

Hazard Identification: “...the identification of potential sources of harm.” (International Standards Organization 1990)

Hazard Identification: The process of recognizing that a hazard exists and defining its characteristics (Standards 1995).

Hazard Management: "...utilizes individual and collective strategies to reduce and mitigate the impacts of hazards on people and places" (Cutter 1993, 2).

Hazard Mitigation: Any measure that will reduce the potential for damage from a disaster event.

Hazard Mitigation: Measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and environment (U.N. 1992, 41).

Hazard Probability: The estimated likelihood that a hazard will occur in a particular area.

Hazard Risk: The probability of experiencing disaster damage.

Hazard Vulnerability: The susceptibility of life, property, or the environment to damage if a hazard occurs.

Hazardous Material (HAZMAT): Any material which is explosive, flammable, poisonous, corrosive, reactive, or radioactive (or any combination), and requires special care in handling because of the hazards posed to public health, safety, and/or the environment. (Firescope 1994)

Heat Wave: Marked warming of the air, or the invasion of very warm air, over a large area; it usually lasts from a few days to a few weeks. (WMO 1992, 294)

Human-Made Disasters: are disasters or emergency situations where the principal, direct cause(s) are identifiable human actions, deliberate or otherwise. Apart from "technological" and "ecological" disasters, this mainly involves situations in which civilian populations suffer casualties, losses of property, basic services and means of livelihood as a result of war or civil strife, for example: Human-made disasters/emergencies can be of the rapid or slow onset types, and in the case of internal conflict, can lead to "complex emergencies" as well. Human-made disaster acknowledges that all disasters are caused by humans because they have chosen, for whatever reason, to be where natural phenomena occurs that result in adverse impacts of people. This mainly involves situations in which civilian populations suffer casualties, losses of property, basic services and means of livelihood as a result of war, civil strife, or other conflict. (Simeon Institute)

Hydrology: Science that deals with the waters above and below the land surfaces of the Earth, their occurrence, circulation and distribution, both in time and space, their biological, chemical and physical properties, their reaction with their environment, including their relation to living beings. (WMO 1992, 306)

Ice Storm: Intense formation of ice on objects by the freezing, on impact, of rain or drizzle. (WMO 1992, 314)

Incident: An event, accidentally or deliberately caused, which requires a response from one or more of the statutory emergency response agencies. (**Australian Fire Authorities Glossary** 1996)

Incident: “Any condition that meets the definition of major disaster or emergency which causes damage or hardship that may result in a Presidential declaration of a major disaster or an emergency.” (**FEMA Disaster Dictionary** 2001, 62-63, citing Title 44 CFR 206.32)

Incident: “Under the ICS concept, an incident is an occurrence, either human-caused or by natural phenomena, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.” (**FEMA Disaster Dictionary** 2001, 62-63, citing National Wildfire Coordinating Group, Incident Command System, National Training Curriculum, *ICS Glossary* (PMS 202, NFES #2432), October 1994)

Incident: A minor situation. (**Oxford Canadian Dictionary**, 1998)

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure with responsibility for management of assigned resources to effectively direct and control the response to an incident. Intended to expand as the situation requires greater resources without requiring new, reorganized, command structures.

Incident Command System (ICS): “A multi-discipline, multi-jurisdictional command system in which the responsibilities and duties of those persons holding key positions within the command structure have been designated by formal agreement and a system which is capable of expanding or shrinking as the situation warrants.” (**FEMA IEMC Terrorism**, 11-5)

Incident Command System (ICS): A standardized on-scene emergency management concept specifically designed to allow it’s users to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. (**NWCG** 1994)

Incident Commander (IC): ICS term for the person, usually from the local jurisdiction, who is responsible for overall management of an incident. On most incidents, the command activity is carried out by a single IC. The IC may be assisted by a deputy from the same agency or from an assisting agency. (**FEMA** 1993)

Individual and Family Grant (IFG) Program: A program through which the Federal government makes a grant to a State for the purpose of making grants to individuals and families adversely affected by a major disaster. Individual and family grants are intended to meet disaster-related necessary expenses or serious needs in those cases where such individuals or families are unable to meet their expenses or needs through assistance under other provisions of the Stafford Act or through other means. (**Stafford Act**)

Individual Assistance: Supplementary Federal assistance provided pursuant to a Presidential Declaration of emergency or major disaster under the Stafford Act to individuals and families adversely affected. Such assistance may be provided directly by the Federal Government or through State or local governments or disaster relief organizations.

Integrated Emergency Management System (IEMS): A strategy for implementing emergency management activities which builds upon those functions common to preparedness for any type of occurrence and provides for special requirements of individual emergency situations.

Intensity: ...refers to the damage-generating attributes of a hazard. For example, water depth and velocity are commonly used measures of the intensity of a flood. For hurricanes, intensity typically is characterized with the Saffir/Simpson scale, which is based on wind velocity and storm surge depths...The absolute size of an earthquake is given by its Richter magnitude (and other similar magnitude scales), but its effects in specific locations are described by the Modified Mercalli Intensity (MMI) Scale...Earthquake intensity is also ascertained by physical measures such as peak ground acceleration (expressed as a decimal fraction of the force of gravity, e.g., 0.4 g), peak velocity, or spectral response, which characterizes the frequency of the energy content of the seismic wave. (**Deyle, French, Olshansky, and Paterson** 1998, 124.)

La Niña: The opposite of an El Niño event, during which waters in the west Pacific are warmer than normal, trade winds or Walker circulation is stronger and, consequently, rainfalls heavier in Southeast Asia. (**Bryant** 1991)

Lightning: Luminous manifestation accompanying a sudden electrical discharge which takes place from or inside a cloud or, less often, from high structures on the ground or from mountains. (**WMO** 1992, 358)

Major Disaster: Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby. (**Robert T. Stafford Act** 102; 44 CFR 206.2 and 206.36)

Management: Management consists of decision-making activities undertaken by one or more individuals to direct and coordinate the activities of other people in order to achieve results that could not be accomplished by any one person acting alone. Effective management focuses on group effort, various forms of coordination, and the manner of making decisions. Management is required whenever two or more persons combine their efforts and resources to accomplish a goal that cannot be accomplished by acting alone. Coordination is necessary when the actions of group participants constitute parts of a total task. If one person acts alone

to accomplish a task, no coordination may be required; but when that person delegates a part of the task to others, the individual efforts must be coordinated. (Unknown source)

Mass Emergency: “An unexpected or undesirable event which requires the resources from most of all municipal departments and limited assistance from outside agencies may be needed.” (Drabek 1996, Session 2, p. 3)

Military Support to Civil Authorities (MSCA): Those activities and measures taken by Department of Defense components to foster mutual assistance and support between DoD and any civil government agency in planning or preparedness for, or in the application of resources for response to, the consequences of civil emergencies or attacks, including national security emergencies. MSCA is described in DoD Directive 3025.1. The Secretary of the Army is designated as the DoD executive agent for MSCA. (Title 32 CFR 185)

Mitigate: To lessen in force or intensity. This definition does not preclude “Lessening to Zero” when mitigation or to mitigate are used in relation to hazards that could cause or contribute to a peacetime civil emergency. (FEMA 1990)

Mitigation: “...mitigation is the *social* attempt to reduce the occurrence of a disaster, to reduce the vulnerability of certain populations, and to more equitably distribute the costs within the society.” (Dynes 1993, 179)

Mitigation: Those activities designed to alleviate the effects of a major disaster or emergency or long-term activities to minimize the potentially adverse effects of future disaster in affected areas. (FEMA 1990)

Mitigation: All steps necessary to minimize the potentially adverse effects of the proposed action and to restore, preserve, and enhance natural values of wetlands; or long-term activities to minimize the potentially adverse effects of future disaster in affected areas. (FEMA 1996)

Mitigation: “...sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Mitigation distinguishes actions that have a long-term impact from those that are more closely associated with preparedness for, immediate response to, and short-term recovery from a specific event” (FEMA 1997, *Multi Hazard...*, xxii).

Mitigation: “Any action taken to eliminate or reduce the long-term risk to human life and property from natural hazards. Mitigation actions are accomplished by:

- **Acting on the hazard.** Seeding hurricanes or triggering avalanches may eliminate a hazard before a disaster occurs.
- **Redirecting the hazard.** A seawall or dune restoration program helps keep water away from people by redirecting the impact areas away from vulnerable locations.
- **Interacting with the hazard.** Seismic safety provisions incorporated into building codes result in structures that are more able to withstand impacts and earthquakes.

- **Avoiding the hazard.** River corridor projects create multiple beneficial uses of the floodplain while relocating structures to less vulnerable locations.” (FEMA IS-513, 1999, I-50)

Mitigation: In its simplest sense, mitigation is risk management. It is a term that we at FEMA use to describe actions that can be taken at the individual, local, State and Federal levels to reduce the overall risk from natural disasters. It is getting a handle on the costs of disasters in our society, including not only moneys, but also suffering and economic disruptions. (Krimm 1998)

Mitigation: “Activities that reduce the degree of long-term risk to human life and property from natural and man-made hazards; e.g., building codes, disaster insurance, land-use management, risk mapping, safety codes, and tax incentives and disincentives.” (McLoughlin 1985, 166)

“Mitigation consists of planned and orderly efforts to prevent hazards that are preventable and lessen the impact of those that are not. Mitigation activities can act in three ways to prevent or reduce effects of potential hazards. First, they can act on the hazard to eliminate it or to reduce the frequency and intensity of its occurrence. Second, they can change the way a hazard interacts with people and their support systems. Third, they can alter the way people live and the systems they create.” (McLoughlin 1985, 170)

Mitigation: Action to reduce the effects of a disaster on a population. (Nimpuno, 1998)

Mitigation: “...mitigation is seen as prevention – stopping a negative event before it happens.” (Peterson and Perry 1999, 242)

Mitigation: Measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and on environment. (U.N. 1992, 4)

Mitigation: “Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.” (U.N. ISDR 2002, 25)

Modified Mercalli Intensity Scale: A measure of the effects of an earthquake in a specific location. (Deyle, French, Olshansky, and Paterson 1998, 124)

Modified Mercalli Intensity Scale: (Jaffe, Buffer, and Thurow 1981)

<u>Intensity</u>	<u>Detectability/Level Impact</u>
I	Detected only by sensitive instruments
II	Felt by a few persons at rest, especially on upper floors
III	Felt noticeably indoors, but not always recognized as a quake
IV	Felt indoors by many, outdoors by a few

V	Felt by most people, damage to glass and plaster
VI	Felt by all, many frightened and run outdoors, damage small
VII	Everybody runs outdoors, damage to buildings varies
VIII	Panel walls thrown out of frames, fall of walls and chimneys
IX	Buildings shifted off foundations, cracked, thrown out of plumb
X	Most masonry and framed structures destroyed, ground cracked
XI	New structures still standing, bridges destroyed, ground fissures
XII	Damage total, waves seen on ground surface

National Disaster Medical System (NDMS): A federally coordinated initiative to augment the nation's emergency medical response capability by providing medical assets to be used during major disasters or emergencies. NDMS has three major components: Disaster Medical Assistance Teams and Clearing-Staging Units to provide triage, patient stabilization, and austere medical services at a disaster site; an evacuation capability for movement of patients from a disaster area to locations where definitive medical care can be provided; and a voluntary hospital network to provide definitive medical care. NDMS is administered by the Department of Health and Human Services/U.S. Public Health Service, in cooperation with the Department of Defense, the Department of Veterans Affairs, FEMA, State and local governments, and the private sector. (**Facts on the NDMS**)

National Security Emergency: "Any occurrence, including natural disaster, military attack, technological emergency, or other emergency, that seriously degrades or seriously threatens the national security of the United States." (**FEMA Disaster Dictionary** 2001, 84; cites Executive Order 12656)

National Voluntary Organizations Active in Disasters (NVOAD): An umbrella organization of established and experienced voluntary organizations that serve disaster-affected communities. (**FEMA** 1995)

Natural Disaster: See "Disaster, Natural"

Natural Hazards: See "Hazard, Natural"

No Adverse Impact: Concept developed by the Association of State Floodplain Managers to promote in efforts to reduce growing flood losses. No Adverse Impact centers on "ensuring that the actions of one property owner do not adversely impact the rights and interests of other property owners, now and in the future." (**ASFPM** 2003, 45-46)

One-Hundred Year (100-Year) Floodplain: The land area adjoining a river, stream, lake, or ocean which is inundated by the 100-year flood, also referred to as a flood having a 1 percent chance of occurring in any given year. The 100-year flood is the regulatory (base) flood under the NFIP. (**FEMA** 1990)

One-Percent Annual Chance Flood: A flood of the magnitude that has a one-percent chance of being equaled or exceeded in any given year. Often referred to as the "100-year"

flood or base flood, the one-percent annual chance flood is the standard most commonly used for floodplain management and regulatory purposes in the United States.

Plume: Identifiable stream of air with a temperature or composition different from that of its environment. Examples are a smoke plume from a chimney and a buoyant plume rising by convection from heated ground. (**WMO 1992**, 456)

Preliminary Damage Assessment (PDA): A process used to determine the impact and magnitude of damage and the resulting unmet needs of individuals, businesses, the public sector, and the community as a whole. Information collected as a result of the PDA process is used by the State as a basis for the Governor's request for Federal assistance under the Stafford Act, and by FEMA to document the recommendation made to the President in response to the Governor's request. (**44 CFR 206.33**)

Preparedness: Those activities, programs, and systems that exist prior to an emergency that are used to support and enhance response to an emergency or disaster. (**FEMA 1992**)

Preparedness: Establishing and delineating authorities and responsibilities for emergency actions and making provisions for having the people, equipment, and facilities in place to respond when the need arises. Preparedness involves planning, training, exercising, procuring and maintaining equipment, and designating facilities for shelters and other emergency purposes. (**Michigan DEM**, 1998, 7)

Preparedness: "Preparedness represents actions that are undertaken to reduce the negative consequences of events where there is insufficient human control to institute mitigation measures." (**Peterson and Perry 1999**, 242)

Preparedness: involves the development and regular testing of warning systems (linked to forecasting systems) and plans for evacuation or other measures to be taken during a disaster alert period to minimize potential loss of life and physical damage; the education and training of officials and the population at risk; the establishment of policies, standards, organizational arrangements and operational plans to be applied following a disaster impact; the securing of resources (possibly including the stockpiling of supplies and the earmarking of funds); and the training of intervention teams. It must be supported by enabling legislation. (**Simeon Institute 1998**)

Preparedness: Activities designed to minimize loss of life and damage, to organize the temporary removal of people and property from a threatened location and facilitate timely and effective rescue, relief and rehabilitation. See also "prevention." (**U.N. 1992**, 4)

Preparedness: "Activities and measures taken in advance to ensure effective response to the impact of disasters, including the issuance of timely and effective early warnings and the temporary removal of people and property from a threatened location." (**U.N. ISDR 2002**, 25)

Prevention: Encompasses activities designed to provide permanent protection from disasters. It includes engineering and other physical protective measures, and also legislative measures controlling land use and urban planning. See also “preparedness”. (U.N. 1992, 5)

Prevention: “Activities to provide outright avoidance of the adverse impact of hazards and related environmental, technological and biological disasters.” (U.N. ISDR 2002, 25)

Probability: The likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating an outcome is certain. (Standards 1995)

Probability Analysis: The derivation of both the likelihood of incidents occurring and the likelihood of particular outcomes (or effects) should those events occur. (NSW 1989)

Public Assistance (PA): Supplementary Federal assistance provided pursuant to a Presidential Declaration of emergency or major disaster under the Stafford Act to State and local governments or certain private, not-for-profit organizations other than assistance for the direct benefit of individuals and families. (FEMA/EMI 1996)

Radiation: Emission or transfer of energy in the form of electromagnetic waves or particles. (WMO 1992, 492)

Radiological Emergency: A radiological incident that poses an actual, potential, or perceived hazard to public health or safety or loss of property. (FRERP, Appendix B)

Recovery: The coordinated process of supporting emergency-affected communities in reconstruction of the physical infrastructure and restoration of emotional, social, economic and physical well-being. (EMI Australia 1996)

Recovery: Those long-term activities and programs beyond the initial crisis period of an emergency or disaster and designed to return all systems to normal status or to reconstitute these systems to a new condition that is less vulnerable. (FEMA 1992)

Recovery: Activities traditionally associated with providing Federal supplemental disaster recovery assistance under a Presidential major disaster declaration. These activities usually begin within days after the event and continue after the response activities’ cease. Recovery includes individual and public assistance programs, which provide temporary housing assistance, grants and loans to eligible individuals and government entities to recover from the effects of a disaster. (FEMA FRP Appendix B)

Recovery: “The process of restoring community infrastructure and social and economic systems following an emergency or disaster.” (Michigan DEM, 1998, 7)

Recovery: "...recovery measures encompass what has traditionally been called reconstruction and recovery; ultimately the rebuilding of the disaster-impacted community." (Peterson and Perry 1999, 242; citing Drabek, 1986)

Regulatory Floodway: The area regulated by federal, state or local requirements to provide for the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated amount (not to exceed one foot as set by the National Flood Insurance Program).

Relief: Assistance and/or intervention during or after disaster to meet the life preservation and basic subsistence needs. It can be of emergency or protracted duration. (U.N. 1992, 5)

Resilience: The capacity to recover successfully from loss and damage. The central features of resilience appear to be access to resources (particularly finance), access to information and services, the capacity to manage one's own affairs and the capacity to deal with the stress and emotions generated by the disaster. (Buckle 1995, 13)

Resilience/Resilient: "The capacity of a system, community or society to resist or to change in order that it may obtain an acceptable level in functioning and structure. This is determined by the degree to which the social system is capable of organizing itself, and the ability to increase its capacity for learning and adaptation, including the capacity to recover from a disaster." (U.N. ISDR 2002, 24)

Resource Analysis: The systematic identification and analysis of available resources and authorities for managing these potential resources in an emergency.

Response: Those activities and programs designed to address the immediate and short-term effects of the onset of an emergency or disaster. (FEMA 1992)

Response: Activities to address the immediate and short-term effects of an emergency or disaster. Response includes immediate actions to save lives, protect property, and meet basic human needs. Based on the requirements of the situation, response assistance will be provided to an affected State under the Federal Response Plan using a partial activation of selected Emergency Support Functions (ESF's) or the full activation of all 12 ESF's to meet the needs of the situation. (FEMA FRP, Appendix B)

Response: "Carrying out time-sensitive actions to save lives and protect property during an emergency or disaster. In addition to managing the response, actions can include fire fighting, protective actions by law enforcement, warning, evacuation, mass care, emergency public information, search and rescue, health and medical care, resource management, and other activities." (Michigan DEM 1998, 7)

Response: "Response refers to actions undertaken immediately before and during impact to reduce primary and secondary negative effects." (Peterson and Perry 1999, 242)

Richter Scale: Logarithmic magnitude scale of earthquake energy, illustrated by typical impacts.

Energies of earthquakes (Richter-scale Magnitude):

Magnitude		Energies (TNT)
1	=	1.7 Kg
2	=	5.9 Kg
3	=	180 Kg
4	=	6 tons
5	=	199 tons
6	=	6,270 tons
7	=	100,000 tons
8	=	6,270,000 tons
9	=	199,000,000 tons (Reference Center 1998)

Risk: A measure of the probability of damage to life, property, and/or the environment, which could occur if a hazard manifests itself, including the anticipated severity of consequences to people. (**Unknown source**)

Risk: “Risk is the product of hazard (H) and vulnerability (V) as they affect a series of elements (E) comprising the population, properties, economic activities, public services, and so on, under the threat of disaster in a given area....Risk is estimated by combining the probability of events and the consequences (usually conceptualized as losses) that would arise if the events take place.” (**Alexander**, No Date, 1)

Risk: Risk = Likelihood x Consequence. (**Ansell and Wharton** 1992, 100)

Risk: Risk is defined as: Risk = Hazard x Vulnerability divided by Disaster Management, where “Risk is defined as the scope of consequences (loss of life, damage to property or the environment.... Hazard is defined as the ‘Punch of Nature’ (external forces)... Vulnerability is defined as the weakness/strength of the element at risk... Disaster Management is defined as a comprehensive strategy based on a set of activities to reduce the risk by: 1. Reduction of the vulnerability of the elements at risk. 2. Ensuring that adequate measures are implemented before disaster strikes. 3. Responding as efficiently and effectively as possible to disasters when they occur. 4. Assuring a sustainable development of the region stricken.” (**Benouar and Mimi** 2001, 6)

Risk: “Risk is nothing more than the consequences of hazard.” (**Bezek** 2002)

Risk: “...risk is when you know the possible range of things that may happen following a choice; uncertainty is when you don’t....Risk in its general form is when it is possible, at least in principle, to estimate the likelihood that an event (or set of events) will occur; the specific forms of those estimates are the probabilities of adverse consequences.” (**Clarke** 1999, 11)

Risk: The possibility of suffering harm from a hazard. (**Cohrssen and Covello** 1989, 7)

Risk: “...the measure of likelihood of occurrence of the hazard” (**Cutter** 1993, 2).

Risk: “*Risk* is the probability of an event occurring, or the likelihood of a hazard happening (Presidential/Congressional Commission on Risk Assessment and Risk Management 1997). Risk emphasizes the estimation and quantification of probability in order to determine appropriate levels of safety or the acceptability of a technology or course of action. Risk is a component of hazard.” (Cutter 2001, 3)

Risk: The probability that a hazardous event will occur and the expected loss of lives and goods due to vulnerability to prevailing hazards. (D&E Reference Center 1998)

Risk: The possibility of suffering harm from a hazard. (Deyle, et al. 1998, 121)

Risk: “...the potential losses associated with a hazard and, defined in terms of expected probability and frequency, exposure, and consequences” (FEMA 1997, *Multi Hazard...Risk Assessment*, xxi).

Risk: The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to a specific type of hazard event. It also can be expressed in terms of potential monetary losses associated with the intensity of the hazard (FEMA 2001 (August), a-6)

Risk: Risk “is the probability that a hazard will occur during a particular time period.” (Godschalk 1991, 132)

Risk: The potential for realization of unwanted, adverse consequences to human life, health, property, or the environment; estimation of risk is usually based on the expected result of the conditional probability of the event occurring times the consequence of the event given that it has occurred. (Gratt 1987, 244)

Risk: “The expected number of lives lost, persons injured, damage to property, and disruption of economic activity due to a particular natural phenomenon, and consequently the product of specific risk and elements at risk – UNDRO.” (Gunn 1990, 374.

Risk: Risk is an expression or possible loss over a specific period of time or number of operational cycles. It may be indicated by the probability of an accident times the damage in dollars, lives, or operating units. (Hammer 1972)

Risk: “A disaster risk is the probability of injury, loss of life, damage to property, disruption of services and activities, and negative environmental effects. The extent to which risk either increases or decreases is the result of interactions within a multiple chain of events.” (Jegillos 1999, 12)

Risk: “...a measure of the probability of deviation from the expected.” (Kloman 2001, 24)

Risk: “The western approach defines risk as the probability of physical harm due to technological or natural processes. However, we know that physical risks are always created and effected in social systems. Therefore, understanding risk means considering the social systems within which risk occur. Furthermore, within a social system, individuals do not necessarily share the same perceptions or risk and underlying risk factors... In the expert knowledge system, disasters are seen as being driven primarily by hazard patters. By contrast, in a people-centered approach, the emphasis shifts from the hazard to a focus on socioeconomic vulnerability.” (Kotze 1999, 35)

Risk: “Risk refers to the probability that death, injury, illness, property damage, and other undesirable consequences will stem from a hazard” (Lerbinger 1997, 267).

Risk: “There are three components of risk – the magnitude of loss, the chance of loss, and the exposure of loss.” (MacCrimmon and Wehrung 1986, 10)

“The main definition of the verb ‘risk’ in the *Oxford English Dictionary*, is ‘to expose to the chance of injury or loss.’ ...First, it is necessary that there be a potential loss of some amount (we will use ‘loss’ as a general expression to include ‘injury’). Second, there must be a chance of loss. A sure loss is not a risk. Third, the notion ‘to expose’ means that the decision maker can take actions that can increase (or decrease) the magnitude or chance of loss. Therefore ‘to risk’ implies the availability of choice.” (MacCrimmon and Wehrung 1986, 9)

Risk: Risk is when there is “accurate knowledge of a probability distribution of the consequences that will follow on each alternative.” (March and Simon, 1993)

Risk: Risk can be related directly to the concept of disaster, given that it includes the total losses and damages that can be suffered after a natural hazard: dead and injured people, damage to property and interruption of activities. Risk implies a future potential condition, a function of the magnitude of the natural hazard and of the vulnerability of all the exposed elements in a determined moment. (Maskrey 1989, 1)

Risk: “The term ‘risk’ is used in two ways. The first is to identify what is **at risk** from the threats generated by the hazard. The second is to identify **the probability** of losing community assets...” (May, p. 6)

Risk: The probability of an event or condition occurring. (Mileti 1999, 106)

Risk: Technical definition as follows: Risk (consequence/unit time) = Frequency (events/unit time) x Magnitude (consequence/event). (NRC 1975)

Risk: “The probability, based on available data and scientific knowledge, of a disaster occurring in a particular place.” (Pearce 2000, Chapter 5, p. 27)

Risk: Defined in three ways:

1. With regard solely to the occurrence probability of the damaging event – a statistical concept.
2. With regard to both event probability and the degree and type of damage or potential damage (here, risk is seen as the product of event probability and severity of impact).
3. With regard to the distribution of power within society as well as to the distribution of costs and benefits. In other words, who bears and who imposes the risk? (**Penning-Rowell** and Handmer 1990, 6; cited in Pearce 2000, Chapter 2, 20)

Risk: A function of two major factors: (a) the probability that an event, or series of events of various magnitudes, will occur, and (b) the consequences of the event(s). (**Petak and Alkinson** 1982)

Risk: The potential for unwanted negative consequences of an event or activity. (**Rowe** 1997)

Risk: The potential losses associated with a hazard, defined in terms of expected probability and frequency, exposure, and consequences. (**Schwab**, et al. 1998, 329)

Risk: For engineering purposes, risk is defined as the expected losses (lives lost, persons injured, damage to property, and disruption of economic activity) caused by a particular phenomenon. Risk is a function of the probability of particular occurrences and the losses each would cause. Other analysts use the term to mean the probability of a disaster occurring and resulting in a particular level of loss. A societal element is said to be at “risk”, or “vulnerable”, when it is exposed to known disaster hazards and is likely to be adversely affected by the impact of those hazards if and when they occur. The communities, structures, services, or activities concerned are described as elements at “risk”. Also, the FEMA damage and casualty production model for simultaneously handling multiple nuclear attacks to produce the spectrum of likely attack results and determine their associated possibilities. A pre-attack planning tool. (**Simeon Institute** 1992)

Risk: Risk is an integral part of life. Indeed, the Chinese word for risk “weij-ji” combines the characters meaning ‘opportunity/chance’ and ‘danger’ to imply that uncertainty always involves some balance between profit and loss. Since risk cannot be completely eliminated, the only option is to manage it. (**Smith** 1996, 54)

Risk: The probability per unit time of the occurrence of a unit cost burden. The cost burden may be measured in terms of injuries (fatalities or days of disability) or other damage penalties (expense incurred) or total social costs (including environmental intangibles). Risk thus involves the integrated combination of (a) the probability of occurrences, (b) the spectrum of event magnitudes, and (c) the spectrum of resultant personal injuries and related costs. (**Starr**, Rudman, and Whipple 1976)

Risk: The product of probability and consequences. (**Tarrant** 1997–98, 20)

Risk: "...the chance that some event that affects us adversely will occur." (Terry 2001, 330) "...the chance of an adverse event happening and the consequences of that event taken together." (331)

Risk: Expected losses (of lives, persons injured, property damaged and economic activity disrupted) due to a particular hazard for a given area and reference period. Based on mathematical calculations, risk is the product of hazard and vulnerability. (U.N. 1992, 5)

Risk: "The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation Risk = Hazards x Vulnerability/Capacity." (U.N. ISDR 2002, 24)

Risk: The possibility of loss, injury, disadvantage or destruction; to expose to hazard or danger; to incur risk or danger. (Webster's 1981)

Risk: Risk is the product of the probability of the occurrence of a hazard and its societal consequences. (Pearce 2000, Chapter 2, 21; citing Whyte and Burton, 1980)

Risk Analysis: Assesses probability of damage (or injury) and actual damage (or injury) that might occur, in light of a hazard and vulnerability analysis. (Unknown source)

Risk Analysis: "Risk analysis involves identifying, measuring or estimating and evaluating risk. There has been considerable debate between engineers and social scientists about whether risk can profitably and successfully be quantified, indeed, whether it is necessary to quantify it at all (Kleindorfer and Kunreuther 1987). Engineers (e.g. Lind 1987) regard risk analysis as a formal means of quantitatively evaluating the possible malfunctioning of a system by assigning probabilities to a set of predicted outcomes. Social scientists (e.g. Slovic 1987) argue that risk need not be quantified to be analyzed and that it is often sufficient to conceptualize a risk in order to know the magnitude of a problem. In general types of risk analysis, comparisons are often more meaningful than absolute numbers or probabilities, especially when the values are quite small, as people tend not to understand likelihoods expressed as small fractions." (Alexander, no date, 2) "Formal risk analysis is based upon the creation of an ensemble of scenarios which express what might happen as a chain of occurrences." (p. 3)

Risk Analysis: "The term risk analysis is often used synonymously with risk assessment. In this book, however, risk assessment refers to the technical assessment of the nature and magnitude of a risk. Risk analysis includes those functions, as well as methods to best use the resulting information. Risk analysis includes methods for:

- Hazard identification
- Risk assessment
- Determining the significance of risk
- Communicating risk information." (Cohrssen and Covello 1989, 355)

Risk Analysis: Estimates of the probability of various levels of injury and damage to provide a more complete description of the risk from the full range of possible hazard events in the area. (Deyle, et al. 1998, 121-122) Risk analysis makes “a quantitative estimate of damage, injuries, and costs likely to be experienced within a specified geographic area over a specific period of time.” (Deyle, et al. 1998, 133-134)

Risk Analysis: A detailed examination performed to understand the nature of unwanted, negative consequences to human life, health, property, or the environment; an analytical process to provide information regarding undesirable events; the process of quantification of the probabilities and expected consequences for identified risks. (Gratt 1987, 244)

Risk Analysis: “...incorporates estimates of the probability of various levels of injury and damage to provide a more complete description of the risk from the full range of possible hazard events in the area” (Deyle, French, Olshansky, and Paterson 1998, 121–122).

Risk Analysis: Risk analysis is the most sophisticated level of hazard assessment. It involves making quantitative estimates of the damage, injuries, and costs likely to be experienced within a specified geographic area over a specific period of time. Risk, therefore, has two measurable components: (1) the magnitude of the harm that may result (defined through vulnerability assessment); and (2) the likelihood or probability of the harm occurring in any particular location within any specified period of time (risk = magnitude x probability). A comprehensive risk analysis includes a full probability assessment of various levels of the hazard as well as probability assessments of impacts on structures and populations. (Deyle, French, Olshansky, and Paterson 1998, 134.)

Risk Analysis: The systematic use of available information to characterize risk. (Salter 1997–98, 24)

Risk Assessment: “A process by which the results of a risk analysis (i.e., risk estimates) are prepared for use in decisions, either through the relative ranking of risk reduction strategies or through comparison with risk criteria.” (Center for Chemical Process Safety 1995, xvii)

Risk Assessment: “refers to the technical assessment of the nature and magnitude of risk”. (Cohrssen and Covello, 1989)

Risk Assessment: “...emphasizes the estimation and quantification of risk in order to determine acceptable levels of risk and safety; in other words to balance the risks of a technology or activity against its social benefits in order to determine its overall social acceptability” (Cutter 1993, 2).

Risk Assessment: Determination of vulnerabilities and hazards in certain location to establish risks and risk probabilities. (D&E Reference Center 1998)

Risk Assessment: “Risk assessment includes one or more of the following components:

- Hazard identification,
- Dose-response assessment,
- Exposure assessment,
- Risk characterization.” (**Environmental Protection Agency** 1986)

Risk Assessment: The process of identifying the likelihood and consequences of an event to provide the basis for informed decisions on a course of action. (**FEMA 1992**)

Risk Assessment: “...a process or method for evaluating risk associated with a specific hazard and defined in terms of probability and frequency of occurrence, magnitude and severity, exposure, and consequences” (**FEMA 1997, Multi Hazard...**, xxi).

Risk Assessment: “Risk Assessment defines the potential consequences of a disaster based upon a combination of the community’s hazard and vulnerability identification.” (**FEMA 1998, Project Impact**, 17)

Risk Assessment: “Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings, and infrastructure to natural hazards.

Risk assessment answers the fundamental question that fuels the natural hazard mitigation process: “What would happen if a natural hazard event occurred in your community.”

A risk assessment tells you:

- “The hazards to which your state or community is susceptible;
- What these hazards can do to physical, social, and economic assets;
- Which areas are most vulnerable to damage from these hazards; and
- The resulting cost of damages or costs avoided through future mitigation projects.” (**FEMA 2001**, iii)

Risk Assessment: Risk assessment estimates the probable degree of injury and property damage in a given area over a specific time interval (**Godschalk, Kaiser, and Berke** 1998, 99.)

Risk Assessment: The process, including both risk analysis and risk management alternatives, of establishing information regarding and acceptable levels of that risk for an individual, group, society, or the environment. (**Gratt** 1987, 244)

Risk Assessment: “A risk assessment is an objective scientific assessment of the chance of experiencing loss or adverse consequences when physical and social elements are exposed to potentially harmful natural and technological hazards, environmental impact, morbidity, and mortality.” (**Hays and Ryland** 2001)

Risk Assessment: “Risk assessment, is a systematic characterization of the probability of an adverse event and the nature and severity of that event (Presidential/Congressional Commission on Risk Assessment and Risk Management 1997). Risk assessments are most

often used to determine the human health or ecological impacts of specific chemical substances, microorganisms, radiation, or natural events. ...In the natural-hazards field, risk assessment has a broader meaning, and involves a systematic process of defining the probability of an adverse event (e.g., flood) and where that event is most likely to occur.” (Hill and Cutter 2001, 15-16)

Risk Assessment: “...the quantitative evaluation of the likelihood of undesired events and the likelihood of harm or damage being caused together with the value judgments made concerning the significance of the results.” (Jones 1992, 27)

Risk Assessment: “...a basic risk assessment:

- Identifies the hazard,
- Profiles the hazard event,
- Inventories the assets that would be impacted (affected), and
- Estimates the losses that would result from events (floods) of different probability.” (Larson and Emmer 2004, Session 16, page 11)

Risk Assessment: “Risk assessment should be recognized as a process which consists of a number of steps. Whilst there is great diversity in the detailed approaches and methodologies used, all risk assessments share some common characteristics. The essential steps are hazard identification including information gathering, an estimation of consequences and frequencies, a characterizations of risk and an evaluation of the significance of the results, which then forms an input to a decision-making process.” (OECD Working Group 1995, 12)

Risk Assessment: A five-step process comprised of:

- (1) Identification of undesired events.
- (2) Analysis of the mechanisms by which undesired events could occur.
- (3) Consideration of the extent of any harmful effects.
- (4) Consideration of the likelihood of the undesired events and the likelihood of specific detrimental outcomes. Likelihood may be expressed as probability or frequency.
- (5) Judgements about the significance of the identified hazards and estimated risks. (Royal Society Study Group 1983)

Risk Assessment: (sometimes Risk Analysis) The process of determining the nature and scale of the losses (due to disasters) which can be anticipated in particular areas during a specified time period. Risk assessment involves an analysis and combination of both theoretical and empirical data concerning the probabilities of known disaster hazards of particular force or intensities occurring in each area (“hazard mapping”); and the losses (both physical and functional) expected to result to each element at risk in each area from the impact of each potential disaster hazard (“vulnerability analysis and expected loss estimation”). (Simeon Institute 1992)

Risk Assessment: ...[R]isk Assessment... is undertaken to find out what the problems are. It involves evaluating the significance of a given quantitative (if necessary, qualitative) measure or risk in an integrated way... Generally speaking, risk assessment is such a complex concept that a single, scientifically repeatable, solution will rarely satisfy all the political and social realities of the decision-making process. (Smith 1996, 54)

Risk Assessment: “The statistical analysis of risk... based on mathematical theories of probability and scientific methods for identifying causal links between different types of hazardous activity and the resulting adverse consequences” (Smith 1996, 57).

According to **Kates and Kasperson** (1983), risk assessment comprises three distinct steps:

1. An identification of hazards likely to result in disasters, i.e. what hazardous events may occur?
2. An estimation of the risks of such events, i.e. what is the probability of each event?
3. An evaluation of the social consequences of the derived risk, i.e. what is the loss created by each event?” (Smith 1996, 58)

Risk Assessment/Analysis: “A process to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability/capacity that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.” (U.N. ISDR 2002, 24)

Risk Assessment: “The term risk analysis is often used synonymously with risk assessment. In this book, however, risk assessment refers to the technical assessment of the nature and magnitude of a risk.” (U.S. Council on Environmental Quality, 1989, 355)

Risk Aversion: “...the value people place directly on reducing their own and others’ risk of death and injury...” (Smith 1996, 72).

Risk Characterization: “Risk characterization is a synthesis and summary of information about a potentially hazardous situation that addresses the needs and interests of decision makers and of interested and affected parties. Risk characterization is a prelude to decision making and depends on an interactive, analytical-deliberate process.” (National Research Council, 1996, p. 27)

Risk Communication: “...risk communication: the effective understanding of risks and the transfer of risk information to the public, and the transfer of information from the public to decisionmakers... Risk management decisions should not simply be made by technical experts and public officials and then imposed on, and justified to, the public after the fact. Risk Communication involves a dialogue among interested parties – risk experts, policy makers, and affected citizens.” (Committee on Risk-Based Analysis...2000, 37)

Risk Communication: “...an interactive process of exchange of information and opinion among individuals, groups and institutions... We construe risk communication to be successful to the extent that it raises the level of understanding of relevant issues or actions for

those involved and satisfies them that they are adequately informed within the limits of available knowledge.” (NRC 1989, 2)

“The NRC (1989, 149) concludes that four objectives are key to improving risk communications: (1) goal setting, (2) openness, (3) balance, and (4) competence. As a means of achieving these objectives, it is important, at the start of any given project, to determine:

- what the public know, believe, and do not believe about the subject risk and ways to control it;
- what quantitative and qualitative information participants need to know to make critical decisions;
- and how they think about and conceptualize the risk. (NRC 1989, 153).”
(Pearce 2000, Chapter 3, 16)

“Pidgeon et al. (cited in Horlick-Jones and Jones 1993, 31) conclude that there are four different conceptual approaches to risk communication:

- Scientific communications – ‘top-down’ or one-way transmission of some message about a hazard from a particular ‘expert’ source to a target ‘non-expert’ audience.
- Two-way exchange – an interactive process that recognizes the important role that feedback plays in any complex communication.
- Wider institutional and cultural contexts stressed – communicator takes account of the actions of risk management institutions, possible conflicting messages, and the history of the hazard in question.
- Risk communication as part of a wider political process – the process as a prerequisite to the enabling and empowerment of risk-bearing groups.”
(Pearce 2000, Chapter 3, 16)

Risk Factors: Frequency of Occurrence

Location

Spatial Area (% of jurisdiction hazard likely to impact)

Duration

Secondary Effects

Seasonality

Speed of onset

Warning availability

Risk Management: “The essence of risk management lies in maximizing the areas that we have some control over the outcome while minimizing the areas where we have absolutely no control over the outcome and the linkage between cause and effect is hidden from us.”
(Berstein)

Risk Management: “Public Risk management is a process that is used to decide what to do where a risk has been determined to exist. It involves identifying the level of tolerance the

community has for a specific risk or set of risks and determines what risk assessment options are acceptable within a social, economic, cultural and political context. To achieve this, the process must be open since it has to factor in benefits, costs of control and any statutory or socially approved requirements needed to manage the risk. Hence, it requires communicating and consulting with the public-at-large, either directly or through appropriate representation as well as with specialists” (Britton 1998, 1).

Risk Management: “Risk Management is a discipline for dealing with uncertainty.” (Kloman 2001, 24)

Risk Management: The art or act of handling the possibility of loss or injury. Involves four components of (1) Indexing critical operations, (2) Assessing risk exposure for those operations designated as “vital” or “high,” (3) Developing mitigation plan outlining who, what, when and how the corrective and preventive actions will be implemented, and (4) Testing and measurement of the effectiveness of the corrective and preventive actions. (Schaming 1998, 26-28.)

Risk Management: The process of intervening to reduce risk—the making of public and private decisions regarding protective policies and actions that reduce the threat to life, property, and the environment posed by hazards. Generally, the risk management process attempts to answer the following questions:

1. What can be done?
2. What options or alternatives are available and what are their associated tradeoffs in terms of costs, benefits, and other (current and future risks)?
3. What are the effects of current decisions on future options? (Shaw, 1999.)

Risk Management: The process whereby decisions are made and actions implemented to eliminate or reduce the effects of identified hazards. (Simeon Institute 1992)

Risk Management: *Risk Management* means reducing the threats to life and property (and the environment) posed by known hazards, whilst simultaneously accepting unmanageable risks and maximizing any associated benefits. (Smith 1996, 54)

Risk Management: A Framework for the systematic application of management policies, procedures and practices to the tasks of identifying, analyzing, evaluating, treating and monitoring risk. (Standards 1995, 4360; quoted in Salter (1997–98, 22)

Risk Management: “The systematic management of administrative decisions, organizations, operational skills and responsibilities to apply policies, strategies and practices for disaster risk reduction.” (U.N. ISDR 2002, 25)

Risk Management: “Process of deciding what should be done about a hazard; deciding which hazards at what scale (intensity, occurrence interval) should be managed and in what priority.” (Williamson and Lawless, 2001)

Risk Perception: “Slovic (cited in Slaymaker 1995, 3) defines risk perception as ‘the ‘common sense’ understanding of hazards, exposure and risk, arrived at by a community through intuitive reasoning ... usually expressed... as ‘safe’ or ‘unsafe’.’ He goes on to mention that ‘policy decisions are almost always driven by perceived risk among the population affected and among decision makers [and that] these perceptions are commonly at variance with ‘technical’ risk assessments.” (Pearce 2000, Chapter 3, 18)

Risk Reduction: Long-term measures to reduce the scale and/or the duration eventual adverse effects of unavoidable or unpreventable disaster hazards on a society which is at risk, by reducing the vulnerability of its people, structures, services, and economic activities to the impact of known disaster hazards. Typical risk reduction measures include improved building standards, flood plain zoning and land-use planning, crop diversification, and planting windbreaks. The measures are frequently subdivided into “structural” and “non-structural”, “active” and “passive” measures. N.B. A number of sources have used “disaster mitigation” in this context, while others have used “disaster prevention.” (Simeon Institute 1992)

Safety: Safety, in the traditional sense, refers to monitoring and reducing the risk of personnel casualties (injuries and deaths) to some acceptable level. (Shaw forthcoming)

Saffir/Simpson Hurricane Scale: A scale for expressing the relative intensity of hurricanes, consisting of five levels of increasing intensity—Categories 1 through 5. (Notification Manual)

Saffir/Simpson Hurricane Scale¹³

Storm Category	Wind Speed (mph)	Storm Surge (ft)
1	74-95	4-5
2	96-110	6-8
3	111-130	9-12
4	131-155	13-18
5	> 155	> 18

Security: Security in the traditional sense refers to monitoring and reducing the risk of human induced events that adversely affect people or property (intrusion of unauthorized personnel, theft, sabotage, assault, etc.), to some acceptable level. (Shaw 1999)

Severe Weather: Any atmospheric condition potentially destructive or hazardous for human beings. It is often associated with extreme convective weather (tropical cyclones, tornadoes, severe thunderstorms, squalls, etc.) and with storms of freezing precipitation or blizzard conditions. (WMO 1992, 544)

Stafford Act: 1) The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended. 2) The Stafford Act provides an orderly and continuing means of assistance by the Federal Government to State and local governments in carrying out their responsibilities to alleviate the suffering and damage which result from disaster. The

¹³ Deyle, French, Olshansky, and Paterson 1998, 124.

President, in response to a State Governor's request, may declare an "emergency" or "major disaster" in order to provide Federal assistance under the Act. The President, in Executive Order 12148, delegated all functions, except those in Sections 301, 401, and 409, to the Director, of FEMA. The Act provides for the appointment of a Federal Coordinating Officer who will operate in the designated area with a State Coordinating Officer for the purpose of coordinating state and local disaster assistance efforts with those of the Federal Government. **(44 CFR 206.2)**

Storm Surge: The difference between the actual water level under influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (i.e. astronomical tide). **(WMO 1992, 584)**

Superfund: The trust fund established initially under the Comprehensive Environmental Response, Compensation, and Liability Act and extended under the Superfund Amendments and Reauthorization Act to provide money that can be used during cleanups associated with inactive hazardous waste disposal sites. **(FEMA 1992)**

Sustainable Communities: "...where people and property are kept out of the way of natural hazards, where the inherently mitigating qualities of natural environmental systems are maintained, and where development is designed to be resilient in the face of natural forces..." **(Godschalk, Kaiser, and Berke 1998, 86)**

Sustainable Development: "In its broader sense, sustainability is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In the context of emergency management, this meaning remains and it is linked to creating places that are less vulnerable to natural and technological hazards and that are resilient to those events. Sustainable hazard management has five components: environmental quality; quality of life; disaster resilience; economic vitality; and inter- and intra-generational equity. Reducing the risk from hazards, reducing losses from disasters and working toward sustainable communities go hand-in-hand" **(Britton 1998, 1)**.

Sustainable Development: "...the reconciliation of society's development goals with Planet Earth's environmental limits over the long term." **(Carrido and Hays 2001, 1)**

Sustainable Development: A strategy for improving the quality of life while preserving the environmental potential for the future, of living off interest rather than consuming natural capital. Sustainable development mandates that the present generation must not narrow the choices of future generations but must strive to expand them by passing on an environment and an accumulation of resources that will allow its children to live at least as well as, and preferably better than, people today. Sustainable development is premised on living within the Earth's means. **(National Commission 1993, 2)**

Sustainable Development: "Sustainable development – which meets the needs of the present without compromising the ability of future generations to meet their own needs – is generally understood to require (1) economic growth, (2) protection of the environment, and (3) sustainable use of ecological systems. There is, however, a fourth criterion of equal

importance: Sustainable development must be resilient with respect to the natural variability of the Earth and the solar system.” (NSTC 1996, 4)

Sustainable Development: Development in the present that does not destroy the resources needed for future development (Simeon Institute 1998¹⁴).

Sustainable Development: Sustainable development is that which “meets the needs of the present without compromising the ability of future generations to meet their own needs.” (UN World Commission 1987, 8)

Terrorism: “The calculated use of unlawful violence or threat of unlawful violence to inculcate fear; intended to coerce or to intimidate governments or societies in the pursuit of goals that are generally political, religious, or ideological.” (FEMA *Disaster Dictionary* 2001, 120; citing DoD Joint Pub 1-102)

Terrorism: “The unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. Domestic terrorism involves groups or individuals who are based and operate entirely within the United States and U.S. territories without foreign direction and whose acts are directed at elements of the U.S. government or population.” (FEMA 2001, *Guide for All-Hazard Emergency Operations* ...p. 6-G-F-3)

Thunderstorm: Sudden electrical discharges manifested by a flash of light (lightning) and a sharp or rumbling sound (thunder). Thunderstorms are associated with convective clouds (Cumulonimbus) and are, more often, accompanied by precipitation in the form of rain showers or hail, or occasionally snow, snow pellets, or ice pellets. (WMO 1992, 622)

Tornado: A violently rotating storm of small diameter; the most violent weather phenomenon. It is produced in a very severe thunderstorm and appears as a funnel cloud extending from the base of a Cumulonimbus to the ground. (WMO 1992, 626)

Tragedy: “An intensely sad, calamitous, or fatal event or course of events; disaster” (Funk & Wagnalls 1996).

“The word ‘tragedy’ summons up in one’s mind the inevitability not only of this event but of other similar events in the past and more to follow. Responsibility can be successfully abrogated with the application of the label ‘tragedy’... One needs to look no further into the cause or causes of this event because it has now been lifted outside of one’s power and into the domain of Greek drama and fate. As a tragedy, it was fated to be and the only possible response is to accept it (and others of its kind) as part of the inescapable human situation. The event may be mourned and one may sympathize briefly with the victims. But one is freed (by thinking of it as a tragedy) from the need to examine the conceptual apparatus that led to this outcome” (Allinson 1993, 14).

¹⁴ Downloaded from web site address: <http://www.cyberg8t.com/simeon/glossary.html> (definitions from The Simeon Institute are obtained from “unattributed sources”).

Typhoon: Name given to a tropical cyclone with maximum sustained winds of 64 knots or more near the centre in the western North Pacific. (WMO 1992, 644)

Unified Command: A method for all agencies or individuals who have jurisdictional responsibility, or in some cases who have functional responsibilities at the incident, to contribute to: determination of overall objectives for the incident, and selection of strategies to achieve the objectives.

Unified Command: “Under the ICS [Incident Command System] concept of operations, Unified Command is a unified team effort which allows all agencies with responsibility for an incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies. This Unified Command effort is accomplished without losing or abdicating agency authority, responsibility, or accountability.” (FEMA *Disaster Dictionary* 2001, 124; citing ICS Glossary)

Volcanic Dust: Dust of particles emitted by a volcano during an eruption. They may remain suspended in the atmosphere for long periods and be carried by the winds to different regions of the Earth. (WMO 1992, 662)

Vulnerability: “People and things are vulnerable to natural hazards, in that they are susceptible to damage and losses. In this respect, vulnerability determines the losses [to disaster] to a greater degree than does hazard.” (Alexander, No Date, 1)

Vulnerability: ...the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone’s life and livelihood is put at risk by a discrete and identifiable event in nature or in society. (Blaikie et al., 9)

Vulnerability: The likelihood that a person will be negatively affected by environmental hazards refers to his or her *vulnerability* (Bolin/Stanford 1998, 9).

Vulnerability: A measure of the extent to which a potential event is likely to deplete or damage available resources such that the reestablishment of usual living conditions cannot be achieved within a reasonable period. In this sense vulnerability may be measured as a ratio of damaged to undamaged resources. (Buckle 1995, 11)

“Buckle (1995, 11) adds the concept of resilience to the definition of vulnerability. He identifies potential social, economic, and environmental effects and introduces the notion that vulnerability is associated with an ability to recover (which is not always apparent in other definitions...)” (Pearce 2000, Chapter 2, 23)

Vulnerability: “...A measure of the degree and type of exposure to risk generated by different societies in relation to hazards (Cannon 1994, 16).”

Vulnerability is a characteristic of individuals and groups of people who inhabit a given natural, social and economic space, within which they are differentiated according to their varying position in society into more or less vulnerable individuals and groups. It is a complex characteristic produced by a combination of factors derived especially (but not entirely) from class, gender and ethnicity. Differences in these socio-economic factors result in hazards having a different degree of impact. (**Cannon** 1994, 19)

Vulnerability: *Vulnerability* is the susceptibility of human settlements to the harmful impacts of natural hazards. Impacts of concern include injuries and deaths to human populations; damage to personal property, housing, public facilities, equipment, and infrastructure; lost jobs, business earnings, and tax revenues, as well as indirect losses caused by interruption of business and production; and the public costs of planning, preparedness, mitigation, response, and recovery. (**Deyle et al.** 1998, 121)

Vulnerability: 1) undefended against, open to attack, disease and hazards 2) degree of potential loss of people and goods from a damaging phenomenon. Vulnerability to hazards is the cause of disasters. (**D&E Reference Center** 1998)

Vulnerability: The vulnerability concept is used to characterize a system's lack of robustness or resilience with respect to various threats, both within and outside the boundaries of the system...the term vulnerability...describe[s] the properties of an industrial system that may weaken its ability to survive and perform its mission in the presence of threats...The properties of an industrial system; its premises, facilities, and production equipment, including its human resources, human organization and all its software, hardware, and net-ware, that may weaken or limit its ability to endure threats and survive accidental events that originate both within and outside the system boundaries. (**Enarson and Rausand** 1998, 535-36)

Vulnerability: “[The] susceptibility to injury or damage from hazards.” (**Godschalk** 1991, 132)

Vulnerability: “The degree of loss to a given element at risk, or set of such elements resulting from the occurrence of a natural phenomenon of a given magnitude and expressed in a scale from 0 (= no damage) to 1 (= total loss) – UNDR0.” (**Gunn** 1990, 374)

Vulnerability: “Vulnerability has been variously defined as the threat of exposure, the capacity to suffer harm, and the degree to which different social groups are at risk (Cutter 1996)...Perhaps equally important is the notion that vulnerability varies by location (or space) and over time – it has both temporal and spatial dimensions...There are many types of vulnerability of interest to the hazards community, but three are the most important: individual, social, and biophysical. Individual vulnerability is the susceptibility of a person or structure to potential harm from hazards...social vulnerability...describes the demographic characteristics of social groups that make them more or less susceptible to the adverse impacts of hazards. Social vulnerability suggests that people have created their own vulnerability, largely through their own decisions and actions...Biophysical vulnerability...examines the

distribution of hazardous conditions arising from a variety of initiating events such as natural hazards...chemical contaminants, or industrial accidents.” (Hill and Cutter 2001, 14-15)

Vulnerability: “Vulnerability is a set of prevailing or consequential conditions composed of physical, socioeconomic and/or political factors that adversely affect ability to respond to events. Vulnerabilities can be physical, social, or attitudinal and can be primary or secondary in nature. Strategies that lower vulnerability also reduce disaster risk.” (Jegillos 1999, 12)

Vulnerability: “Risk...should not be confused with vulnerability, which refers to the resources and coping abilities of a specific community to a specific hazard...Vulnerability is a reflection of the community’s coping resources and may vary within the smaller social and economic groups which form a large community.” (Lindsay 1993, 68)

Vulnerability: Vulnerability of any physical, structural or socioeconomic element to a natural hazard is its probability of being damaged, destroyed or lost. Vulnerability is not static but must be considered a dynamic process, integrating changes and developments that alter and affect the probability of loss and damage of all the exposed elements. (Maskrey 1989, 1)

Vulnerability: “Vulnerability is defined as the susceptibility of life, property, or the environment to damage if a hazard occurs.” (May, p. 6)

Vulnerability: “For some, particularly natural and physical scientists, vulnerability is defined as proximity or exposure to natural hazards or the probability of a disastrous occurrence (including the potential for losses owing to triggering agents) (see Reynolds 1993).¹⁵ Engineers, in contrast, define vulnerability as the ability of a built structure to resist the strain or force exerted by natural or other disaster agents (Norton and Chantry 1993).¹⁶ Sociologists, anthropologists and other social scientists define vulnerability as the amount of coping capacity, or the degree to which social, cultural, political and economic factors limit the ability to take steps to mitigate, prepare for, respond to, or recover from disaster (see Blaikie and others 1994; Sinha 1992a¹⁷; Pelanda 1982¹⁸).” (McEntire 1999, 5)

Vulnerability: “...vulnerability is the reactive or dependent component of disaster which is comprised of both the negative and positive attributes from the physical and social environments that increase risk and susceptibility and/or limit resistance and resilience to triggering events...” (McEntire 1999, 5)

¹⁵ Referenced is a chapter in *Natural Disasters: Protecting Vulnerable Communities*, edited by P.A. Merriman and C.W. Browitts (London: Thomas Telford, 1993).

¹⁶ Referenced is chapter by Norton and Chantry in *Natural Disasters: Protecting Vulnerable Communities*, edited by P.A. Merriman and C.W. Browitts (London: Thomas Telford, 1993).

¹⁷ Sinha, D.K. Ed. 1992. *Natural Disaster Reduction to the Nineties: Perspectives, Aspects and Strategies*. Calcutta: International Journal Services.

¹⁸ Pelanda, Carlo. 1982. “Disastro e vulnerabilita sociosistemica.” *Rassegna Italian di Sociologia* 22:507-532.

Vulnerability: "...the potential for loss or the capacity to suffer harm from a hazard...can generally be applied to individuals, society, or the environment" (**Mitchell** 1997, 10).

Vulnerability: "The susceptibility of people, property, industry, resources, ecosystems, or historical buildings and artifacts to the negative impact of a disaster." (**Pearce** 2000, Chapter 5, p. 37). Is "a function of people, place, preparedness, and time..." (Ibid., p. 44)

Vulnerability: "Vulnerability can be defined as the propensity to incur loss." (**Puente** 1999,296)

Vulnerability: The degree of susceptibility and resilience of the community and environment to hazards, the characteristics of a community or system in terms of its capacity to anticipate, cope with, and recover from events. (**Salter** 1997–98, 28)

Vulnerability: The extent to which a community, structure, service, or geographic area is likely to be damaged or disrupted by the impact of a particular disaster hazard, on account of their nature, construction, and proximity to hazardous terrain or a disaster-prone area. For engineering purposes, vulnerability is a mathematical function defined as the degree of loss to a given element at risk, or set of such elements, expected to result from the impact of a disaster hazard of a given magnitude. It is specific to a particular type of structure, and expressed on a scale of 0 (no damage) to 1 (total damage). For more general socio-economic purposes and macro-level analyses, vulnerability is a less-strictly-defined concept. It incorporates considerations of both the intrinsic value of the elements concerned and their functional value in contributing to communal well-being in general and to emergency response and post-disaster recovery in particular. In many cases, it is necessary (and sufficient) to settle for a qualitative classification in terms of "high", "medium", and "low"; or explicit statements concerning the disruption likely to be suffered. (**Simeon Institute**)

Vulnerability: Ability to withstand damage – expressed on a scale of 0 (no damage) to 10 (total damage). (**UNDRO** 1991)

Vulnerability: Degree of loss (from 0% to 100%) resulting from a potentially damaging phenomenon. (**U.N.** 1992, 5)

Vulnerability: "Vulnerability to disasters is a status resulting from human action. It describes the degree to which a society is either threatened by or protected from the impact of natural hazards. This depends on the condition of human settlements and their infrastructure, the way in which public policy and administration are engaged in disaster management, the level of information and education about hazards and how to deal with them." (**UNISDR** 2001)

Vulnerability: "A set of conditions and processes resulting from physical, social, economical and environmental factors, which increase the susceptibility of a community to the impact of hazards." (**U.N. ISDR** 2002, 24)

Vulnerability Analysis: Identifies what is susceptible to damage. Should provide information on extent of the vulnerable zone; population, in terms of size and types that could be expected to be within the vulnerable zone; private and public property that may be damaged, including essential support systems and transportation corridors; and environment that may be affected.

Vulnerability Analysis: The process of estimating the vulnerability to potential disaster hazards of specified elements at risk. For engineering purposes, vulnerability analysis involves the analysis of theoretical and empirical data concerning the effects of particular phenomena on particular types of structures. For more general socio-economic purposes, it involves consideration of all significant elements in society, including physical, social and economic considerations (both short and long-term), and the extent to which essential services (and traditional and local coping mechanisms) are able to continue functioning. (**Simeon Institute 1998**)

Vulnerability Analysis: The objectives of a vulnerability analysis of an industrial system may comprise:

To identify potential threats to the system

To verify that the vulnerability of the system is acceptable

To verify that the system's security actions and installations, and safety functions are adequate

To evaluate the cost-effectiveness of a proposed action to improve the vulnerability

To aid in establishing an emergency preparedness plan

As a design tool—to design a robust system

In a vulnerability analysis we work with open system models, where risk factors both inside and outside the physical boundaries of the system are taken into account. A vulnerability analysis and a risk analysis of the same company will therefore produce quite different sets of accidental events....

A traditional risk analysis is mainly limited to accidental events taking place within the physical boundaries of the system, and the threats studied are often limited to technological hazards within these boundaries....The actions to mitigate, restore and restart the activities after an accident are normally not part of a risk analysis....A vulnerability analysis focuses on the whole disruption period until a new stable situation is obtained....The focal point of a vulnerability analysis is the (business) survivability of the system. (**Einarsson and Raussand 1998**)

Vulnerability Assessment: Evaluation of the likely degree of loss to a risk or a set of hazards. (**D&E Reference Center 1998**)

Vulnerability Assessment: ...characterizes the exposed populations and property and the extent of injury and damage that may result from a natural hazard event of a given intensity in a given area. (Deyle, French, Olshansky and Paterson 1998, 121).

Vulnerability Assessment: Vulnerability assessment, the second level of hazard assessment, combines the information from the hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard. It provides information on who and what are vulnerable to a natural hazard within the geographic areas defined by hazard identification; vulnerability assessment can also estimate damage and casualties that will result from various intensities of the hazard.” (Deyle et al. 1998, 129)

Vulnerability Assessment: A vulnerability assessment presents “the extent of injury and damage that may result from a hazard event of a given intensity in a given area. The vulnerability assessment should address impacts of hazard events on the existing and future built environment.” (FEMA 2001 (August), 7)

Vulnerability Assessment: Vulnerability assessment estimates the number of people exposed to hazards (including special populations such as the elderly, hospitalized, disabled, and concentrated populations such as children in schools), the property exposed, and the critical facilities exposed (such as medical care facilities, bridges, sewage treatment and water pumping and treatment plants, power plants, and police and fire stations. (Godschalk, Kaiser, and Berke 1998, 98-99.)

Vulnerability Assessment: “Vulnerability assessments include risk/hazard information, but also detail the potential population at risk, the number of structures that might be impacted, or the lifelines, such as bridges or power lines (Platt 1995), that might be damaged. Vulnerability assessments describe the potential exposure of people and the built environment. The concept of vulnerability incorporates the notion of differential susceptibility and differential impacts.” (Hill and Cutter, 2001, 16)

Vulnerability Assessment: “Some emergency managers include geophysical and topographical factors in the vulnerability assessment process, while others include them in the risk assessment process. For example, Picket and Block (1991, 278-79), following the work of Terrence Haney, discuss the development of an earthquake hazard vulnerability model that utilizes data from five key areas: (1) geophysical, (2) topographical, (3) transportation and utility infrastructure, (4) structural facilities (buildings and bridges), and (5) demographic factors. Pearce et al. (1993, 4) argue that the consideration of geophysical and topographical factors belongs in the risk assessment process. For example, an analysis that concludes that the existence of a fault-line increases the likelihood of an earthquake occurring is part of risk assessment; however, the proximity of the community to the fault-line may increase or decrease the vulnerability of the population. Related to this argument is Anderson’s (1992) suggestion that emergency planners should give special consideration to the growing vulnerability of metropolitan areas. Anderson makes an important point, as often the consequences of disasters in metropolitan areas are related to how geographic and topographic information has been considered. If, for example, such information is perceived to be part of risk assessment, then proximity to a fault-line would lead to mitigation measures that could

address the need to reduce risk by zoning against construction near the line, expropriating existing properties, and so on. If, on the other hand, such information is perceived to be part of vulnerability assessment, then the issue becomes not one of reducing the likelihood of experiencing an earthquake but of how to decrease one's vulnerability by residing in an earthquake-resistant building, improving the infrastructure, or whatever." (Pearce 2000, Chapter 2, 24-25)

Warning: Dissemination of message signaling imminent hazard which may include advice on protective measures. See also "alert". (U.N. 1992, 5)

Warning: A warning is issued by the National Weather Service to let people know; that a severe weather event is already occurring or is imminent. People should take immediate safety action. (Simeon Institute 1992)

Watch: A watch is issued by the National Weather Service to let people know that conditions are right for a potential disaster to occur. It does not mean that an event will necessarily occur. People should listen to their radio or TV to keep informed about changing weather conditions. A watch is issued for specific geographic areas, such as counties, for phenomena such as hurricanes, tornadoes, floods, flash floods, severe thunderstorms, and winter storms. (Simeon Institute 1992)

Wetlands: Those areas which are inundated or saturated by surface or ground water with a frequency sufficient to support, or that under normal hydrologic conditions does or would support, a prevalence of vegetation or aquatic life typically adapted for life in saturated or seasonally saturated soil conditions. Examples of wetlands include, but are not limited to, swamps, fresh and salt water marshes, estuaries, bogs, beaches, wet meadows, sloughs, potholes, mud flats, river overflows, and other similar areas. This definition includes those wetland areas separated from their natural supply of water as a result of activities such as the construction of structural flood protection methods or solid-fill road beds and activities such as mineral extraction and navigation improvement. This definition is intended to be consistent with the definition utilized by the U.S. Fish and Wildlife Service in the publication entitled, Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al., 1977). (FEMA 1992)

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