DISASTER PLANNING

: should be agent-specific or generic?

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＜CONTENTS＞

＜국문초록＞

본 연구는 미국의 재해대책에 대한 최근의 변화를 조사·분석하여 우리나라에서도 계속적으로 발생하여 사회적으로 큰 피해를 입힌 각종 재해에 대비한 향후 방재정책이 나가야 할 관점을 제시하였다.

과거부터 재해에 관한 연구가 양적·질적으로 많이 이루어져왔던 미국에서도 최근의 플로리다 태풍, 로스앤젤레스 지진, 일본의 고베지진 등의 영향으로 인해 재해에 대비한 계획에 있어 근본적인 수정이 있어야 한다는 의견이 대두되고 있는 실정이다.

이러한 내용중 가장 중요한 것은 미국에서 재난에 대하여 내진설계, 방파제와 제방건설, 첨단 컴퓨터만으로 태풍과 지진에 대하여 완벽하게 대항할 수 있다고 생각하던 관점에서 기술적인 한계에 따른 사회정책측면에서의 대책수립이 보완적인 측면에서 필요하다는 것이다.

따라서 본 연구는 재해예방대책중에서 이러한 사회정책적인 관점을 중심으로 기존의 연구들을 검토·분석하였다.

본 연구의 결과 기존 재해관련대책들은 보고서 위주의 비현실적인 계획이어서 실제 재해가 발생할 때 커다란 역할을 담당하지 못해 왔다는 사실이 파악되었으며, 각종 재난에 대하여 지나치게 세분화된 비효율적인 계획이라고 판단되었다. 따라서 향후의 재해관리체계는 각종 인위재해(Man-made Disaster)와 자연재해(Natural Disaster)를 통합·관리하는 총체적인 방재계획(Generic Disaster Planning)으로 수립되어야 할 것으로 판단된다.

Ⅰ. Introduction

It has been much debate among disaster management researchers that disaster planning should be either generic/comprehensive planning or agent-specific planning. It used to be that disaster planning means an agent-specific plan like hurricane response plan, earthquake mitigation plan, and so on. Recently, this trend has been changed to pro generic disaster planning approach.

It has been argued by many researchers that although the disaster agents are different, the response generated demands are the same, so the disaster plan should be generic instead of agent-specific. They also argue that generic plan is more efficient because it can avoid a situation that a community has several separate disaster plans for different disaster agents and duplicated plans by different disaster related organizations (Drabek, 1991 : Dynes, 1993 : Quarantelli, 1988b, 1991, 1992, 1993b, 1993c : Sorenson, 1990 : Towfighi, 1991 : Waugh, Jr., 1988 : Waugh, Jr. and Hy, 1990).

On the other hand, some researchers argue technological disasters are different in many regards from natural disasters and therefore planning should be based on natural disaster and technological disaster typology. This view is very common among the researchers who study chronic or long-term effects of technological disasters (See Schorr et al., 1982 : Baum, 1981, 1984; Bromet, 1980 : Houts and Goldhaber, 1981, Couch and Kroll-Smith, 1985, 1990, and 1991 : Erikson, 1991 : Kroll-Smith and Couch, 1990).

The purpose of this study is to shed lights on this debate through a discussion based on a review of disaster related literature. To accomplish this purpose the author will review various disaster related literature and discuss pros and cons of each approach. And based on this discussion as well as some other information general guidelines for a good disaster planning will be proposed.

Ⅱ. What is disaster and what is a disaster planning?

1. Definition of Disaster

The definition of disaster has been the subject of much debate. In ancient times the term

disaster was used with more care and deeper sense of dread compared to the popular usage of the term today to describe everything from a flooded basement to a defeat in football to a nuclear power plant explosion (Drabek, 1991). "The original Latin meaning signified the unfavorable aspect of a star; disaster thus connoted a harmful influence that came from the heavens and was beyond human control (Drabek, 1991)." Today the term usually suggests images like earthquake, hurricanes, floods, explosions, and so on. The traditional disaster definition has been based on the extent of damage to buildings, their contents, and associated physical impacts due to various natural events or industrial incidents. The amount of property destruction and numbers of deaths and injuries are often used as a criteria for defining a disaster. Thus, if the dollar value of damage and number of deaths and injuries exceed a certain criteria which may have been created by a society or an agency of that society, they define that incident as a disaster. For example, the Federal Emergency Management Agency defines disaster as (FEMA, 1984, pp.1～3):

> *An occurrence of a severity and magnitude that normally results in deaths, injuries, and property damage and that cannot be managed through the routine procedures and resources of government. It usually develops suddenly and unexpectedly and requires immediate, coordinated, and effective response by multiple government and private sector organizations to meet human needs and speedy recovery.*

This definition, based on the amount of damage and casualties, is very useful for both public policy makers and general public in terms of real world practical use. However, researchers observe some serious pitfalls in this definition. The nuclear reactor accident at the Three Mile Island (TMI) in 1979 provides a good example. There wasn't any single fatality or injured person in this incident, but the intangible societal impacts of this incident is considered as one of the biggest disaster in U.S. history. Through stricter regulation, reduced operation of reactors worldwide, greater public opposition to nuclear power, reliance on more expensive energy sources, and increased costs of reactor construction and operation, the incident produced enormous societal impacts. So, the simple linear definition of disaster based on the monetary damage and human casualties is not enough definition in studying disaster even though it has very important meaning for the current societal system. Thus, it seems very logical that the definition of disaster should include consideration about impacts on social systems as well as

physical damages.

Fritz (1961, p.655) defined "disasters are accidental or uncontrollable events, actual or threatened [Emphasis is author's], that are '*concentrated in time and space, in which a society, or a relatively self-sufficient subdivision of a 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.*' (Drabek, 1986, p.7)" It is worth to overemphasize the fact that disasters can be created without anything actually happened as we have seen in TMI incident.

Another very thoughtful definition was stated by Kreps (1984, p.312):

> *events, observable in time and space, in which societies or their larger subunits (e.g., communities, regions) incur physical damages and losses and/or disruption of their routine functioning. Both the causes and consequences of these events are related to the social structures and process of societies or their subunits* [Emphasis is author's].

A few years later, Kreps (1987) gives a much more clarified definition of disaster compared to routine emergency:

> *disasters may be defined as nonroutine events in which societies or their larger subsystems (e.g., regions or communities) are socially disrupted and physically harmed. The key defining characteristics of such events are ① length of forewarning, ② magnitude of impact, ③ scope of impact, and ④ duration of impact.*

Besides above definitions by Fritz (1961) and Kreps (1984), there have been numerous definitions which some have gained wide acceptance and some have not. Dynes (1970) proposed nine features in which disaster agents differ : ① frequency, ② predictability, ③ controllability, ④ cause, ⑤ speed of onset, ⑥ length of possible forewarning, ⑦ duration, ⑧ scope of impact, and ⑨ destructive potential (Drabek, 1986, p.45). Foster (1976) proposed to use the life-event stress scales as an analogy to develop a scale of event magnitude using four criteria : ① number of fatalities, ② number of seriously injured, ③ infrastructural stress, ④ total population

affected (Drabek, 1986, p.45). Schulberg (1974, p.86) proposed that *". . . the probability of disaster can be viewed as a function of the degree of danger inherent in a hazardous situation times the risk of people being exposed to it times the vulnerability, or adaptive capacity, of affected persons."* (Drabek, 1986, p.46).

The concept of collective stress offers conceptual integration, that is, assessing the state of a system as denoted by the discrepancy between disaster generated demands and capacity (Drabek, 1986, p.46). Barton (1969), Haas and Drabek (1973), Rossi et al. (1978), and Geipel (1982) are to name a few examples under this criteria (Drabek, 1986, p.46).

The importance of these definitions boils down in two things. First, disaster could be an actual happening or a threat to happen. As we saw in Fritz (1961) and Kreps (1987), disasters can be created without anything actually happened. Second, disasters are different from emergencies and also different from catastrophes and this will be discussed further later.

Wenger's (1978) article, "Community Response to Disaster : Functional and Structural Alterations," gives an important implication in defining disaster. In this article, Wenger (1978) approaches definition of disaster by analyzing community social system functions and the intensity of the event. Wenger (1978, p.19), first, describes the normal functions of community social systems in predisaster state. Those five functions include ① production-distribution-consumption : ② socialization : ③ social participation : ④ social control : and ⑤ mutual support. Wenger (1978, p.19) elaborates each of these five functions ① as the process of providing the needed goods and services to the locality : ② as the process of transmitting cultural elements to the individual members of the community (public institutions like schools) : ③ as community elements that provide opportunity for social interaction within the locality (like social and cultural activities, and meetings of clubs and associations) : ④ as organizations engaged in for the normative conformity (legal authorities like traffic control or nuisance law) : and ⑤ as local units whose activities concern providing aid and service.

After he analyzes how these five functions have been changed from predisaster state to disaster state, Wenger defines disaster, at the community level, *". . . a condition in which the traditional structure, due to the impact of a precipitating geophysical event, is destroyed and/or no longer collectively defined as an appropriate guide for social behavior in the altered system*

(Wenger, 1978, p.27)."

The importance of this definition lies beyond the definition itself. This definition provides another important implications in defining and differentiating among emergency, disaster, and catastrophe. Wenger (1978) shed lights on the definitions of these three states based on his observations about the relationship between the disaster generated demand and the crisis management capability of a community. Within a community, disaster represents a crisis of relatively high intensity, that is, the event creates demands upon the community system that cannot be met by its traditional, institutional structure including its set of community -emergency and emergency-relevant organizations (Wenger, 1978, p.27). Depends on the degree of the crisis management capability including both human and material resources compared to the demands created by the incident, the incident will be emergency, disaster, or catastrophe for the community or communities.

Some organizations or communities have developed standard operating procedures (SOPs) to cope with crisis situations. An emergency is often managed by an organization (public or private) having responsibility or authority to effectuate an emergency response to deal with the situation, or is managed by local organizations such as the police and/or fire department (Quarantelli, 1988). For example, if a local utility company can handle the everyday, localized breakdowns with local resources and personnel, it is an emergency (Quarantelli, 1988).

During disasters, organizations or communities are often faced with a whole new set of circumstances with which they must cope (Quarantelli, 1988, p.16). Organizations may have to: ① quickly relate to more and different groups and other organizations; ② adjust to losing a part of their autonomy; ③ apply different performance standards; and ④ operate within a closer public and private sector interface (Quarantelli, 1988, p.16). Disasters are not only quantitatively different, in involving different numbers of people and damage, but more qualitatively different. These differences are expanded upon by Auf Der Heide (1989, p.54) and it is summarized in Table 1.

<Table 1> Differences between emergencies and disasters

Routine Emergencies	Disasters
Interaction with familiar faces	Interaction with unfamiliar faces
Familiar tasks and procedures	Unfamiliar tasks and procedures
Intra-organizational coordination needed	Intra- and inter-organizational coordination needs
Roads, telephones, and facilities intact	Roads may be blocked or jammed, telephones jammed or non-functional, facilities may be da- maged
Communications frequencies adequate for radio traffic	Radio frequencies often overloaded
Communications primarily intra-organizational	Need for inter-organizational information sharing
Use of familiar terminology in communicating	Communication with persons who use different terminology
Need to deal mainly with local press	Hordes of national and international reporters
Management structure adequate to coordinate the number of resources involved	Resources often exceed management capacity

Source: Adapted from Auf Der Heide (1989, p.54).

Quarantelli (1993, pp.4～5) summarized the characteristics of catastrophe compare to disasters as : ① most or all of the total residential community is impacted : ② the facilities and operational bases of almost all emergency organizations are themselves directly hit : ③ local officials often are unable to undertake their usual work roles, and this extends into the recovery period : and ④ most of the normal everyday community functions are sharply and simultaneously interrupted.

In general, emergency management can be divided into four phases : mitigation, preparedness, response, and recovery. Mitigation policies and programs are those involved with the decision of how to respond to a risk and the implementation of programs to reduce or eliminate that risk (Petak, 1985, p.3). Risk reduction programs include land-use decisions, building codes, and some other forms of regulation. These programs can be very political sometimes just like the scientific assessments of risk sometimes represent a consensus derived from a large number of competing

interests rather than a simple, objective assessment. Preparedness policies and programs are those involved with the development of response plans, identification of the resources, and the training of emergency services personnel (Petak, 1985). Response policies and programs are those that become operational once a disaster occurs, including emergency medical services, housing and food assistance, evacuations, and search and rescue operations (Petak, 1985). Recovery programs address the immediate problems of stabilizing the affected community and assuring that life-support systems are operational (Petak, 1985). <Table 2> summarizes well the specific activities for each phase.

<Table 2> Activities of each emergency planning phase

Planning phase	Examples of activities
Mitigation	building codes, disaster insurance, land-use management, risk mapping, safety codes, and tax incentives
Preparedness	emergency operations plan, warning systems,emergency operation centers, emergency communications networks, emergency public information, mutual agreements, resource management plans, and training and exercises for emergency personnel
Response	emergency plan activation, emergency instructions to the public, emergency medical assistance, managing operations centers, reception and care, shelter and evacuation, and search and rescue
Recovery	debris clearance, contamination control, disaster unemployment assistance, temporary housing, and facility restoration

Source: Adapted from Waugh and Hy (Editors) (1990, p.19).

2. Typology of crises

Many researchers make a major distinction between two types of crises: consensus type crises and conflict type crises. Consensus type crises include natural and technological disasters and conflict type crises include riots and civil disturbances (Quarantelli, 1993, p.67 : Quarantelli, 1993b, p.4).

Consensus type crises include: ① the human and social aspects associated with natural hazardous agents such as hurricanes, floods, volcanic eruptions, tornadoes, earthquakes, and tsunami : ② and risk producing technological agents such as explosions, fires, chemical and nuclear plant accidents, electric and energy system failures, biological poisonings, and large scale transportation wrecks and structural collapses (Quarantelli, 1993, p.68 : Quarantelli, 1993b, p.5). Compared to conflict type crises, one of the most important characteristics of the consensus type crises is the widespread consensus on terminating the crises as soon as possible at the time of impact (Quarantelli, 1993, p.69 : Quarantelli, 1993b, p.5). There may be, however, disagreements on the means to be used for that purpose.

Conflict type crises contrast sharply with consensus type crises. Conflict type crises best exemplified with such as wars, riots and civil disturbances, terrorist attacks and hostage takings, product tampering and sabotage by groups, and ethnic cleansing and massacres (Quarantelli, 1993, p.67 : Quarantelli, 1993b, p.5). In these situations, one or more parties are consciously and deliberately trying to inflict damage, destruction and/or disruption on some of the involved populations (Quarantelli, 1993, p.69; Quarantelli, 1993b, p.5). In disasters there may be disagreements but it is not the conscious and deliberative intent of any of the parties involved to prolong the crisis (Quarantelli, 1993b, p.5). Generally, disasters tend to be relatively localized in time and space, whereas the conflict type behaviors tend to be more diffuse in time and space (Quarantelli, 1993, p.69 : Quarantelli, 1993b, p.5). Conflict occasions are one kind of collective stress situations (Barton, 1970) and there are certain elements shared with disasters, but nonetheless the differences are far more important than the similarities (Quarantelli and Dynes, 1970; Dynes and Quarantelli, 1973; Kreps, 1984; Quarantelli, 1993, p.69 : Quarantelli, 1993b, p.5).

The importance of the typology is that the emergency time context for organizational activity in the two types of crises can be different (Quarantelli, 1993, p.69; Quarantelli, 1993b, p.4). The planning for and managing of conflict situations differs in important ways than what is required in consensus occasions (Quarantelli, 1993b, p.5).

Quarantelli (1993 and 1993b) give a good example about this matter by comparing the difference in delivery of emergency medical services and the functioning of hospitals during disasters and riots. During disasters the flow of patients to hospitals in disasters tend to build up

quickly, peaks and then drops off quickly with the more seriously injured arriving after the less seriously injured (Quarantelli, 1993, p.69 : Quarantelli, 1993b, p.4). In riots, there is no such clear pattern; the flow can be rather erratic, and the severity of the arriving injured is not related to the time period (Quarantelli, 1993, p.69 : Quarantelli, 1993b, p.4). The subject of discussion in this study is consensus type crises, in other words, natural and technological disasters. In the following section, we discuss more details about consensus type crises.

3. Typology of disaster

Traditionally, disasters have been separated according to their agent source; for example, floods, earthquakes, chemical explosions, nuclear radiation accidents and etc. (Quarantelli, 1988a, p.26). From this, it has been proceeded to a separation into two major categories in terms of a presumed distinction of controllability in the original source of the problem, that is, natural disasters and technological disasters (Quarantelli, 1988a, p.26). Historically, and for the legal and insurance purposes, natural disasters and technological disasters have been called as Acts of God and man-made disasters, respectively (Quarantelli, 1988a, p.26). However, the value of the distinction has been challenged on various grounds as societal situation has been changed (Quarantelli, 1988a, p.27). More recently, various dimensions of typology or taxonomy of disasters have been proposed but no one of them has won much acceptance as yet (Quarantelli, 1988a, p.27).

III. Generic approach vs. agent specific approach

1. Pro agent-specific approach point of view

Earlier disaster planning used to be originated agent-specific manner and it is still true in many communities because of various reasons. Although the SARA Title III, which requires communities to develop emergency response plans for fixed-site facilities that store hazardous chemicals (Rogers and Sorensen, 1991), has contributed to the comprehensive disaster planning approach for the U.S. communities, still many of the real world disaster plannings are

agent-specific oriented

A pro agent-specific view, which argues technological disasters are different in many regards from natural disasters and therefore disaster planning should be based on this typology, is more common among researchers who studies the chronic or long-term effects of technological disasters such as Three-Mile Island (TMI) nuclear accident and Love Canal incident.

For example, based on their study about Three Mile Island Reactor accident, Schorr et al. (1982) suggested that chronic effects of a technological disaster are a new type of disaster which may become increasingly important in modern industrial societies.

Along with chronic stress, there are several features of accidents in technological systems that seem different in nature or degree from other disasters or mishaps.

For example, Baum (1984) listed four characteristics to distinguish technological disasters from other major events. Those are toxicity, low point of impact, controllability, and blame.

Toxicity refers to the involvement of toxic substances in an accident. Radiation, dangerous gases, chemicals, and the like may all be considered toxic. The level of exposure required to produce harmful effects may or may not be known, but recognition or awareness by victims of a toxic element and possible exposure in a disaster appears to be associated with chronic uncertainty and stress (Baum, 1984).

A low point in an event reflects that point at which the worst is over. After this point is reached, things gradually improve, the effects of the event diminish, and life begins to regain a sense of normalcy. This high-water mark is common to natural disasters : floods, storms, earthquakes, and the like have clear points at which they have done their worst. After this point, the flood waters recede, the winds diminish, the tremors cease, and rebuilding and recovery begin. Though clear progress in restoring quality of life to pre-disaster levels may not be immediately recognized, there is a sense of relief at the passing of the highly threatening event and an undeniable movement upward from the low point.

Technological catastrophes do not always have low points. Some, such as fires, are more likely to have low points than others, and the nature of the threat involved appears to partly determine this. Those accidents involving toxic substances appear to have the least low points, as chronic uncertainty may ultimately be as threatening or more so than the original event (Baum, 1984).

Generally, most disasters, which are considered as Acts-of-God, are uncontrollable, though technological catastrophes offer the possibility of control, which is often frustrated. Because technological systems are under human control, malfunctions are controllable if proper procedures are known.

The human element in technological catastrophes introduces the possibility of blame, which is not present in natural disasters. No one is to blame for a storm or earthquake. Blame may be placed for complications in recovery or for the magnitude of damage done, but no one is culpable for the event itself. However, in technological catastrophes, some person or persons are ultimately culpable. The focus of blame may not be the same for all victims, and some may not assign blame at all. However, the possibility of doing so is uniquely enhanced in these catastrophes.

After their study about TMI accident, Baum et al. (1981) suggest some reasons for believing that the technological catastrophes are different from natural disasters. Baum et al. (1981, p.335) say that although technological disasters and natural disasters share some similarities, many of their characteristics are different. The properties of these differences include the suddenness, power, destructiveness, predictability, and low point of the event (Baum et al., 1981). In this study, they have described that natural disasters are ″sudden and powerful events that are nearly universally threatening and typically involve destruction of property (Baum et al., 1981, p.339)″. ″Natural disasters also have an identifiable low point, after which conditions slowly improve″ and ″natural disasters are only moderately predictable at best; although warnings may be possible, they rarely can be made very specific (Baum et al., 1981, p.339).″

Both natural disasters and technological disasters are relatively sudden and powerful and, although neither is very predictable, technological mishaps may be less predictable than natural disasters (Baum et al., 1981, p.346). Both may cause visible destruction and disfigurement of the environment, but technological disasters can leave an area visibly untouched, producing less visible threats such as exposure to radiation or toxic waste (Baum et al., 1981, p.346). And they suggest that technological disasters can have more chronic effects than do natural disasters (Baum et al., 1981, p.346).

Table 3 summarizes the above discussion.

<Table 3> Summary of characteristics of natural disasters and technological disasters

	Natural Disasters	Technological Disasters
Suddenness	Sudden	Sudden
Power	Powerful	Powerful
Visible Damage	Usually causes disfigurement of environment	Some involve visible destruction. Others (e.g., TMI, Love Canal) do not.
Predictability	Some predictability can be obtained because occurrence rates for an area can be obtained from past experience and forecasts can provide some warning.	Not predictable; failures are usually sudden and leave little time for eva- cuation.
Low point	Usually, there is an identifiable clear low point. Conditions tend to impro- ve with passage of time.	There may be a clear low point, but particularly in toxic disasters, this is not so.
Perceptions of Control	Not controllable.	Technology is normally under human control. Therefore, mishaps are likely to be perceived as loss of control.
Extent of Effects	Usually limited to victims of disaster.	Loss of confidence and credibility may engender effects in people not directly victimized by the mishap.
Persistence of Effects	Effects appear to relatively short lived.	May be either acute or chronic, but appear to be likely to cause long-term consequences for many, particularly in toxic substance related disasters.

Source: Adapted from Baum et al. (1983, p.347)

Numerous other studies, which also examined differences between technological disasters and natural disasters, have focused on victims short-term or long-term psychological effects. Adler (1943), for example, studied short-term effects of technological disasters by studying Cocoanut

Grove fire. Green's (1980) Ph.D. dissertation about Beverly Hills Night Club fire and Huerta and Horton's (1978) study about a dam failure in Idaho also examples of studies about disaster victim's emotional sufferings. After the dam collapse and flood at Buffalo Creek in Logan County, West Virginia, Titchener and Kapp (1976) reported high rates of emotional disturbances. Gleser et al.'s (1978, 1981) study after several years of the Buffalo Creek dam failure found evidence of anxiety, depression, hostility, and sleep disturbances. The study about resident's experience at Love Canal incident (Levine, 1982) which involving toxic waste or radiation also reported some chronic consequences, but available evidence is very controversial. And there are numerous studies about psychological impact after TMI accident (See, for example, Baum et al., 1982; Bromet, 1980; and Houts and Goldhaber, 1981).

In their paper which was presented at the Annual Meetings of The Society for the Study of Social Problems, Couch and Kroll-Smith (1991) said that there are common patterns of social response which accompany living near a toxic waste dump or putting up with a contaminated water supply. Couch and Kroll-Smith (1991) said that these patterns include a high level of psychological distress; a great deal of intergroup conflict, both within a community and between a community and extra-local organizations; and much grassroots social activism (Couch and Kroll-Smith, 1991). The research on long-term technological hazards shows a pervasive pattern of psychological trauma and social disruption unlike natural disasters (See Cuthbertson and Nigg, 1987; Edelstein, 1988; and Kroll-Smith and Couch, 1990).

Erikson (1991) has observed that communities which experience toxic contamination creates alienation of residents. The horrific dread of chemical warfare is another case which creates very different psychological effects from natural disasters (Couch and Kroll-Smith, 1985 and 1990). In their article in 1985, Couch and Kroll-Smith defined the chronic technical disaster as:

> *a slowly developing, extended, humanly produced deterioration in human system-ecosystem relations, in which an entire community or sectors therein perceive and/or incur danger to health and safety and the disruption of on going patterns of social and cultural relation* (Couch and Kroll-Smith, 1985, p.566).

Based on the study about Centralia, PA. and Love Canal, New York, Couch and Kroll-Smith (1985, p.566) argue that the unique pattern of psychological, social, and cultural disruption is

accompanied the chronic technological disaster due to the incessant, gradual quality of the disruption agent and the degree and nature of human influence producing it and/or required to abate it. In this study they said that a community's response to a disaster is influenced by the nature of the disaster agent itself and suggested some of the ways in which differences between the immediate impact natural disaster and the chronic technical disaster.

Collective Definitions and Response. If a disaster agent strikes quickly, and within moments or hours disappears, a "therapeutic community" can be expected to emerge wherein citizens and their organizations expand their ordinary roles within the community to meet the immediate needs of the injured, homeless, and grief stricken. However, if a disaster agent emerges gradually, sporadically advancing, more or less by increments, inflicting minor damage in one place, threatening greater devastation in another place, then disagreements can be expected to emerge over both the correct interpretation of the situation and the proper role of citizens and community organizations in responding to the problem (Couch and Kroll-Smith, 1985, pp.566~567).

Emergency Social System. Once an immediate natural disaster is over, community and extracommunity efforts can be uniformly directed toward reestablishing routine and order in and around the disaster site. However, because of the extended duration chronic technical disasters, those community and extracommunity efforts that can be organized in spite of the ambiguous situation will be channeled toward the disaster agent itself and the health and safety of residents. Reestablishing order and routine must wait until the disaster agent is brought under control. The ambiguity of individual and organizational roles exists for some time, creating many long-term problems (Couch and Kroll-Smith, 1985, p.567).

Conflict and Accountability. If the disaster is seen as being natural in origin, then it is less likely that the community will divide over the question of blame. There may be conflict over blame for lack of preventive measures or inadequate provision of services after the fact, but not over the cause or lack of control of the disaster agent itself. By contrast, the typical chronic technical disaster is due to some measure of human error. If a disaster agent is interpreted by both the affected population and outside agencies as caused at least in part by human ignorance, apathy, and greed, then it is more likely that community conflict will emerge over the question of assigning accountability or blame in an effort to gain perspective on an otherwise ambiguous

situation (Couch and Kroll-Smith, 1985, p.568).

Expert Intervention. In case of natural disasters, extralocal government and assistance organizations are prepared to offer immediate financial and material resources to the survivors. But with chronic technical disasters, the situation is without adequate precedent and is much more ambiguous. It is more likely that technical uncertainty and conflicting data regarding human and environmental risk evaluation will permit a wide range of scientific interpretations, further frustrating the community's efforts to achieve some control over the situation (Couch and Kroll-Smith, 1985, pp.568~569).

Psychological Reactions. A disaster of whatever type threatens the psychological stability of the affected population. Acute stress, delusion, and hysteria may follow any disaster. If a disaster is natural, then survivors can be expected to adapt a coping style which is consistent with the quality and quantity of the disaster agent. Consistent with the temporary presence of the disaster agent, acute stress, delusion, and hysteria, when present, can be expected to persist for only a relatively short period of time. However, if a disaster is human-technical in origin and advances slowly and erratically, then the coping style of the victim population can be expected to reflect the chronic, persistent nature of the disaster agent. Anxiousness and delusion, or the readiness to hold on to perceptions contradicted by available evidence and common sense, may become embedded in the character structure of some or all of the victim population (Couch and Kroll-Smith, 1985, pp.569~570).

Couch and Kroll-Smith's (1985) discussion has centered on the likely influence of types of disaster agents on a community. However, they also emphasized that a collective response is a product of a community's interaction with the disaster agent. If we can delineate some common social characteristics of communities most likely to be confronted with a certain type of disaster, we can move from an abstract consideration of the disaster agent to an examination of specific response patterns to be expected from a certain type of community. If all disasters strike at random, this task would be impossible, for we could not determine any distinctive characteristics of communities which are likely to be affected. This is not the case for technological disasters. Couch and Kroll-Smith (1985) argue that chronic technical disasters are much more likely to strike predominantly lower-class communities than other types of settlements. Of course, it has been said that most all disasters, include natural disasters, impact hardest on the lower classes.

Lower-class housing is less likely to withstand a hurricane; lower-class residents are less likely to have adequate insurance protection, or to possess adequate financial resources so as to be able to rebuild or escape from the scene. At the same time, it appears that disasters vary concerning the likelihood that they will strike a certain segment of the population at all. Couch and Kroll-Smith (1985) argue that chronic technical disasters such as mine fires and toxic waster dumps, which are much more likely to occur in lower-class areas. Lower-class communities more likely to have a history of dependence on and exploitation by corporations and governments with centers of power located far away from the community itself.

2. Pro generic approach point of view

Quarantelli (1991c) explains the shift from agent-specific to generic approach in two perspectives. First, theoretically, there has been a shift away from a physical focus toward a more social conception of disasters (Quarantelli, 1991c, p.98). Researchers now recognize that an event such as an earthquake or a chemical explosion does not automatically result in a disaster. Unless there are significant social negative consequences of some kind, these happenings remain only a geophysical event or a chemical process (Quarantelli, 1991c, p.98). In this perspective, Quarantelli (1991c, p.98) argues that "a disaster can be identified only in terms of a social occasion, by the characteristics individuals and groups reacting to a situation. The socially oriented conception of disaster shifts the focus to the common or similar properties of the social happening and away from the physical features of natural and technological agents and their effects."

Second, empirically, social science studies reveal that most sociobehavioral features of disasters are not agent-specific, but are generally similar for different types of natural and technological agents (Quarantelli, 1991c, p.98; see also Drabek, 1986; Tierney, 1981). These researchers view that for many of the human and organizational problems in preparing for and managing a response to disasters, it does not matter what specific kind of disaster agent is involved. They view that "Whatever the agent, the same general activities have to be undertaken, whether the task be warning, evacuation, sheltering, feeding, search and rescue, disposition of the dead, mobilization of resources, communication flow, interorganizational coordination, or public

information, and whether the tasks involve individuals or groups (Quarantelli, 1991c, p.98)."

Researchers, who argue disaster planning should be generic, think that despite the differences between disaster agents many of the tasks that need to be performed in a serious chemical emergency are not markedly different from those needed in a major natural disaster. Care of the sick and injured, establishment of security at the disaster site, provision of information to the public, overall coordination of the response and a number of similar tasks all must be performed in any community emergency (Tierney, 1981). Many of the same community emergency organizations, specially police department and fire department, become involved in any disaster response, regardless of the type of agent. Thus, Tierney (1981) argues that it seems both efficient and cost effective to incorporate community preparedness for chemical emergencies into more comprehensive preparedness measures for the entire range of threats a community faces (Tierney, 1981). Besides the researchers mentioned above, Perry (1983), Wijkman and Timberlake (1984), Bolton (1986), Waugh, Jr. (1988), Waugh, Jr. and Hy (1990), Sorenson (1990), Towfighi (1991), Drabek (1991), Dynes (1993), and several other researchers express their support for the generic disaster planning approach. Their principle, which is quoted from Quarantelli (1991c, p.99), is that:

> *Although disaster agents and the human and material resources needed to respond to them may vary, the same generic kinds of activities must be performed in the predisaster, preimpact, response, recovery periods, regardless of the specific threat. It is like a battle on land is fought with different weapons, materials, personnel and support systems than those used in sea battles, but, nevertheless, the general overall battle requirements are the same for both.*

Quarantelli (1991c, p.100), however, does not deny that there are important differences between disaster occasions, though. Only that they are not linked to specific agents. For example, in some cases warning is possible and in others it is impossible or difficult. In some cases a disaster's impact is diffuse and in others it is focused and local. Quarantelli (1991c, p.101) argues that the physical difference between an explosion and an earthquake is less important than the fact that neither usually allows time for warning. Some approaches cut across agents and look at different dimensions of the social setting in which disaster occur.

Quarantelli (1991c, p.101) also argues that disaster typologies based on combinations of

meaningful dimensions of social occasions would help us understand common social behavior for different agents and different social behavior for the same agent. "Such typologies should combine such generic social dimensions as a disaster's predictability, relative loss impact, recurrence, unfamiliarity, and rapidity of onset; the social centrality of the affected population; the proportion of the population involved; and how long they are involved (Quarantelli, 1991c, p.101)." All of these dimensions can be seen as characteristics of the social occasion rather than of the physical disaster agent.

These dimensions cut across not only different disaster agents, both natural and technological, but also the same disaster agents such as a flood or chemical explosion (Quarantelli, 1991c, p.101). For example, a chemical explosion may be a familiar threat near chemical complexes but unfamiliar in other communities. The local people's familiarity with chemical complexes will affect their responses to warnings, their probability of evacuating, and their expectations about emergency organization and behavior (Quarantelli, 1991c, p.101). Based on this discussion, Quarantelli (1991c, p.101) proposed eight characteristics of a population's response to disasters which emphasize characteristics of the social occasion rather than of the physical agent. Those are:

1) the relative proportion of the population involved,
2) the social centrality of the affected population,
3) the length of time the affected population is involved,
4) the rapidity of involvement by the population,
5) the predictability of involvement,
6) the unfamiliarity of the crisis,
7) the depth of the population's involvement, and
8) the recurrence of involvement (Quarantelli, 1991c, p.101).

Quarantelli (1991c, p.100) also pointed out that the generic approach has not always been easy to accept. One reason is, Quarantelli (1991c) said, that much early work on disasters focused on the physical agent involved, so this became a habitual way of approaching the problem to some, for example, flood control or hurricane specialists. More recently, researchers and operational people in fire research and nuclear risk have shown a similar reluctance to move away from an

agent-specific orientation. They have long struggled with questions about those physical agents and their agent-specific characteristics, and they have trouble seeing that sociobehavioral studies of other disaster situations can apply to their own areas (Quarantelli, 1991c, p.100).

Another reason is that because many of the people working on disaster problems live in relatively different professional and intellectual research worlds, it may be limited for them to recognize that the agent-specific may be less valid than generic approach (Quarantelli, 1991c, p.100).

Ⅳ. Conclusion and planning implications

1. Conclusion

One consequence of the scheme of natural and technological disaster typology is a tendency to approach planning for disasters in agent-specific terms. In real world, many of disaster plannings tends to be agent-specific and there is tendency to organize separate and distinctive planning around specific disaster agents. There often exist separate plans for disasters resulting from hazardous chemicals, hurricane threats, nuclear plants, flood threats, and so on. Also, planning is often separated with usually different organizations for preparing and responding to the separately viewed threats or impacts. The agent-specific approach assumes that each type of hazardous agent has certain distinctive characteristics that have consequences for what occurs. This agent-specific approach has been criticized by many researchers during the last decade or so. They have questioned the efficiency of this approach.

The generic approach assumes that there are more individual and organizational behavioral similarities than differences across all disaster occasions. This approach considers that for very many of the human and organizational problems in preparing for and managing the response to disasters, the specific kind of agent which might be involved in the disaster does not matter. Rather, the emergency disaster tasks like warning, evacuation, sheltering, feeding, search and rescue, disposition of the dead, mobilization of resources, communication flow, interorganizational coordination, public information, and etc., in other words, the same general activities have to be undertaken irrespective of the specific agent in the situation. So, it is more approved consensus

among disaster researchers that it should be generic rather than agent-specific to be a good disaster planning.

2. Other general disaster planning guidelines

Besides be generic, a review of various disaster literature reveals following guidelines to make a good disaster planning. Those are:

(1) View disasters as quantitatively and qualitatively different from accidents and minor emergencies.

Almost all community organizations deal with local minor emergencies. Local community organizations have standard operating procedures (SOPs) to manage those minor emergencies. Often these organizations have highly skilled personnel who have become quite adept at dealing with minor crises. This often leads to the belief that a local disaster is merely a very large scale accident (Drabek, 1991; Quarantelli, 1984, 1988b, 1991). As we have discussed in the earlier section, however, these and similar views are wrong. Disasters are different quantitatively and qualitatively from emergencies as we have discussed. Thus, "An accident cannot be perceived as a little disaster, nor can a disaster viewed as a big accident (Quarantelli, 1991, p.40)."

Quarantelli (1988b) summarized a new set of circumstances which organizations are often faced with during disasters. Organizations may have to:

(a) Quickly relate to more and different groups and other organizations;
(b) adjust to losing a part of their autonomy;
(c) apply different performance standards;
(d) operate within a closer public and private sector interface; and
(e) respond to being directly impacted themselves (Quarantelli, 1988b).

Therefore, disaster planning which does not consider the qualitative and quantitative differences between emergencies and disasters cannot be good (Drabek, 1991 : Quarantelli, 1988b, 1991). It is very important that disaster planners view that they have to think about disaster in a different way from everyday accidents and minor emergencies (Drabek, 1991 : Quarantelli, 1988b, 1991).

(2) Modest planning is a reasonable good. In other words, focus on general principles rather than specific details.

Researchers suggest that it is wrong to go into very specific details in disaster planning because of several reasons (Drabek, 1991; Quarantelli, 1988b, 1991). First, it is impossible to plan for everything. Second, situations are constantly changing and specific details quickly become out-of-date. Third, the presence of too many details gives the impression that everything is of equal importance, which is not the case. Fourth, a complex and detailed plan is intimidating to potential users and tends to be ignored (Drabek, 1991; Quarantelli, 1988b, 1991).

While disaster planning cannot totally ignore specifics, particularly at the organizational level, good disaster planning should be based upon the use of general principles from which simple rather than complex points can be developed (Drabek, 1991; Quarantelli, 1988b, 1991).

(3) Avoid paper plan syndrome. Highlights a continuing process rather than an end product, such as the production of a written plan.

Disaster planning is not synonymous with the formulation of written disaster plans. To many, the planning of a disaster plan is the essence of planning. The development of a written plan at a specific time is only a small part of the total preparedness process. It is a serious mistake to assume that preparedness is complete merely because a written document has been produced. Plans need to be kept up-to-date and must be changed to meet new conditions and requirements. An out-of-date plan may be worse than no plan at all if time is wasted in trying to put it to work. (Auf Der Heide, 1989; Drabek, 1991; Quarantelli, 1988b, 1991).

Drabek (1991, p.40) and Quarantelli (1988b, p.58 : 1991, pp.52～53) suggests that planning is more a process than a product, encompassing all of the following:

(a) Convening meetings for the purpose of sharing information:
(b) Holding disaster drills, rehearsals, and simulations:
(c) Developing techniques for training, knowledge transfer, and assessments:
(d) Formulating memoranda of understanding and mutual aid agreements:
(e) Educating the public and others involved in the planning process:
(f) Obtaining, positioning, and maintaining relevant material resources:
(g) Undertaking public educational activities:
(h) Establishing informal linkages between involved groups:
(i) Thinking and communicating information about future dangers and hazards:
(j) Drawing up organizational disaster plans and integrating them with overall community mass

emergency plans : and

(k) Continually updating materials/strategies.

Thus, while formal disaster plans are an element in disaster preparedness, they are best viewed as only one of numerous activities which should be undertaken to improve the efficiency and effectiveness of a community disaster response (Quarantelli, 1988b : 1991).

(4) Be based upon an emergent resource coordination and not a command and control model.

There is a strong tendency to view emergency planning as analogous to military planning; that is, to assume that a command and control model work best (Auf Der Heide, 1989 : Drabek, 1991 : Dynes, 1993 : Quarantelli, 1988b, 1991). This is the notion taken from the military area that a top down, rigidly controlled, and highly structured social organization model ought to be developed for disaster purpose (Auf Der Heide, 1989; Drabek, 1991 : Dynes, 1993 : Quarantelli, 1988b, 1991). Incident Command System (ICS) is the most known example of command and control model in disaster planning. The pros and cons for this model is well summarized in "Is the Incident Command System a Plan for All Seasons and Emergency Situations?" by Wenger et al. (1990).

The command and control model has important limitations, however, even in military. More importantly, research indicates that such a model does not accurately capture what really goes on during a disaster. In fact, a command and control model would probably not be viable even if attempted (Auf Der Heide, 1989 : Drabek, 1991 : Dynes, 1993 : Quarantelli, 1988b, 1991). In general, the command and control model assumes that disasters create a tremendous discontinuity with everyday life which lowers the effectiveness of individual behavior and reduces the capacities of the social organizations involved (Drabek, 1991 : Quarantelli, 1988b, 1991). Given this, planning is centered on the development of mechanisms to control supposedly widespread maladaptive individual behavior and on the creation of ad hoc structures to replace the supposedly disrupted and non-functioning social organizations in the disaster area (Drabek, 1991 : Quarantelli, 1988b, 1991). Planning efforts are thus directed at the creation of strong authority to overcome the supposedly social disintegrating effects created by the disaster agent (Drabek, 1991; Quarantelli, 1988b, 1991). This kind of planning effort is oriented around creating an artificial and authoritarian structure to replace natural and spontaneous behavior and structure (Drabek, 1991; Quarantelli, 1988b, 1991). The natural and spontaneous response is viewed as incapable of being effective in the stress conditions created by a disaster event (Drabek, 1991 : Quarantelli,

1988b, 1991).

However, the research suggests different evidence. In disasters, there is less discontinuity with everyday life than is frequently supposed. Also, rather than exhibiting irrational and abnormal behavior, disaster victims maintain their traditional activities and their usual occupational and family responsibilities (Drabek, 1991 : Quarantelli, 1988b, 1991). Most organizations in disasters tend to operate as well as they do on an everyday basis. It is extremely rare for them to become non-functional even in the worst of catastrophes (Drabek, 1991 : Quarantelli, 1988b, 1991).

Thus, in good disaster planning, rather than attempting to centralize authority, it is more appropriate to develop what might be called an emergent resource coordination model or problem solving model (Drabek, 1991 ; Dynes, 1993 : Quarantelli, 1988b, 1991). Table 4 summarizes the differences between command and control model and problem solving model.

Drabek (1991, p.45) also suggests that the coordination model is effective if it accomplishes the following:

(a) Efficient mobilization of personnel and resources:

(b) Timely communication of information within and between local clusters of organizations:

(c) Timely communication with the public:

(d) Resolution of conflicts over goals, tactics, and resources:

(e) Effective interaction with regional and national government units when need : and

(g) Effective exercise of authority when needed.

(5) Be based on valid knowledge and not myths and misconceptions

Disaster planning is based on the assumptions made about individual and organizational behavior during disasters (Quarantelli, 1988b, 1991). Unfortunately, most disaster planning takes place on an ad hoc basis and/or is based on the most recent limited disaster or minor emergency experience of the organization or community. The planning, therefore, is not based on any systematic knowledge about behavior in disasters (Quarantelli, 1988b, 1991). This would not be a problem if the common sense notions and assumptions made about disaster time were valid. However, social science studies in disaster has consistently shown that many popular views about disaster behavior are inaccurate as shown in Table 5 (Drabek, 1991 : Quarantelli and Dynes, 1973 : Wenger et al, 1985).

Table 4. Assumptions and Consequences of Different Models of Emergency Planning

Assumptions	Command and Control Model	Problem Solving Model
Characteristics of emergency behavior	Chaos	Continuity
Characters of emergency response	Command	Coordination
Characters of involvement	Control Plan for dramatic change Plan for reduced social capacity Create new structure Predetermine new authority Create centralized decision making	Cooperation Plan for continuity Plan for unexpected problems Utilize existing structures Utilize preemergency authority Utilize decentralized decision making and coordinate
Consequences for planning	Anticipate loss of emergency workers	Anticipate extensive helping behavior
	Expect problems of role abandonment	Anticipate importance of family support system
	Emphasis on providing authoritative public announcements	Emphasis on organizational intelligence and keeping public informed
	Emphasis on agent-generated demands	Emphasis on response-generated demands as well as agent-generated demands
	Emphasis on standardized scenarios and operating procedures	Emphasis on improvisation based on preparedness and alternative solutions
	Emphasis on creating a paramilitary structure	Emphasis on mobilizing social sources
	Primary dependence on established organizations	Utilization of a wide variety of organization forms
	Emphasis on minimizing volunteer assistance	Emphasis on effectively utilizing volunteers
	Emphasis on maintaining a closed system	Emphasis on maintaining a flexible open system

Source : Adapted from Dynes (1993, p.185).

<Table 5> Myths and realities of disaster

Myths	Realities
Because people faced with a great danger will panic, warnings should be withheld until the last minute.	Information about danger should be disseminated not withheld because of fear that people will panic. They will not.
Even those who do not act irrationally are often immobilized by disaster and will need help with such basic tasks as getting fed, housed, and clothed.	Residents of disaster-affected areas respond actively and do not wait for community officials to tell them what to do.
Local social units are severely limited in their ability to handle emergency demands effectively. Outside help is essential.	Local social units generally have enough material resources and personnel to deal with the situation. Outside aid should be consistent with local requirements and not sent indiscriminately.
The social disorganization that results from disaster impact allows antisocial behavior to surface. Because social control is weak or absent, those in the disaster area become easy victims of looting and other forms of criminal activity.	Although symbolic security measures should be taken, massive deployment of forces for security is usually unnecessary. Looting and other antisocial behaviors are not major problems in most disaster situations.
Community morale is very low in disaster-stricken areas. Steps must be taken to overcome demoralization of the affected population.	Community morale is generally high immediately after a disaster. Quick restoration of essential community services tends to sustain it.
A community stricken by a disaster may descend into total personal and social chaos. Immediate, firm, and unequivocal control is required, often from the outside.	Communities mobilize rapidly to meet emergency demands even under severe circumstances. Timely coordination is more important than control.

Source: Adapted from Drabek (1991, p.35).

More damage will be done by what people incorrectly believe to be true than by lack of knowledge per se. Unfortunately, in the disaster area false beliefs about human and social aspects abound among emergency planners and emergency officials (Drabek, 1991 : Quarantelli and Dynes, 1973 : Wenger et al., 1985). To be a good disaster plan, it should be based on the realities rather than myths and misconceptions.

(6) Be based on what is likely to happen.

Some planners are more oriented towards conceptualizing the worst situation imaginable rather than focusing on the realistic possibilities which will be present. It is important to acknowledge the worst possible situation, however, the disaster plan should be based on how people and groups usually react during normal and emergency situations, than to expect them to change their behavior drastically during disasters (Quarantelli, 1988b, 1991). Thus, planners must adjust their planning to include an understanding of people and their behavior under stress, rather than expect people to change their behavior in order to conform with the planning (Quarantelli, 1988b, 1991).

The principle is equally applicable to organizations. It is useless most of time to assume that organizational domains or territories which prevail during normal periods will suddenly disappear during disaster periods (Quarantelli, 1988b, 1991). Disaster planning must be adaptable enough to include expected organizational behaviors, rather than try to force organizations to drastically alter their activities in order to meet the requirements of planning (Quarantelli, 1988b, 1991).

Also, good disaster planning must include education and training as a key component. They need to not only teach one's own group on what to expect, but also learn how others are likely to respond (Quarantelli, 1988b, 1991).

(7) Distinguish between planning and managing, between the strategies and the tactics.

There are some major differences between the planning for and the managing of a disaster (Quarantelli, 1988b, 1991, 1992). The principles of disaster preparedness planning are not the same as the principles of emergency time crises management (Quarantelli, 1988b, 1991, 1992).

In general, strategy refers to the overall approach to a major problem or basic objective. But there are always specific situational contingencies or factors which have to be taken into account in particular circumstances. This is tactics (Quarantelli, 1988b, 1991, 1992). Thus, we can equate good disaster planning with the best strategy that could be followed in readying a community for a sudden disaster, while good managing involves the best tactics which could be used to handle particular contingencies in the emergency time period of a specific disaster (Quarantelli, 1988b, 1991, 1992).

Quarantelli (1988b) also suggests four criteria to evaluate good managing of disaster plans. Quarantelli (1988b, p.63) says that "We can judge that the management is good if it results in the: ① Efficient mobilization of personnel and resources : ② the adequate processing of

information between and within organizations, from and to the public, and within systems of organizations : ③ the effective exercise of authority and decision making; and ④ the development of coordination rather than control."

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