EXPLORING THE INTERFACE OF URBAN PLANNING AND DISASTER MANAGEMENT

Establishing the Connection between the Fields

BY

JOHN RODERICK LINDSAY

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF CITY PLANNING

Department of City Planning
University of Manitoba
Winnipeg, Manitoba

© January, 1993

National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file *Votre référence*

Our file *Notre référence*

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-81739-9

Canada

EXPLORING THE INTERFACE OF URBAN PLANNING AND DISASTER MANAGEMENT

ESTABLISHING THE CONNECTION BETWEEN THE FIELDS

BY

JOHN RODERICK LINDSAY

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF CITY PLANNING

(c) 1993

Permission has been granted to the LIBRARY OF THE UNIVERSITY OF MANITOBA to lend or sell copies of this Thesis, to the NATIONAL LIBRARY OF CANADA to microfilm this Thesis and to lend or sell copies of the film, and UNIVERSITY MICROFILM to publish an abstract of this Thesis.

The author reserves other publication rights, and neither the Thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

ABSTRACT

The urban environment is being increasing exposed to natural and technological hazards. Disaster research has identified urban planning as one field that may have a greater role to play in addressing these dangers but its relationship with disaster management has remained underdeveloped. This thesis explores the interface of urban planning and disaster management through an examination of the common goals, practices, philosophies, and challenges shared by the fields. The thesis recognizes the potential mutual benefits that may be realized through increased cooperation and integration.

Disasters are a negative product of the human-use system's interaction with the natural and built environments. Managing disasters therefore requires the management of this interaction. Urban planning currently manages the positive aspects of this interaction through a proactive planning process. Conversely, disaster management currently employs a reactive, contingency planning process to develop responses to the negative products of this interaction. Integrating the two fields will improve the management of the interaction and will therefore yield benefits to both. The fields share a goal of protecting the community and promoting a safe, prosperous future. They also have common concerns over social equity and environmental protection. Integration will improve the ability of both fields to achieve this goal and to meet these concerns. This approach is based on the organizational concept of positive symbiotic relationships.

Disaster research recognizes that the separation from urban planning is a shortcoming of current disaster management efforts. Urban planning theory relies on the protection of society as its primary justification for intervention. This thesis recommends that a safety committee may be employed as an initial step towards complete integration of the two fields. The thesis firmly establishes that an interface exists between the urban planning and disaster management and that reuniting these two interdependent fields will prove to be mutually beneficial.

ACKNOWLEDGMENTS

A Master's Thesis is attributed to one student but it is not the product of solitary effort. I wish to thank all those who contributed to this work in their own unique ways. Specifically: Dr. Mario Carvalho who, as my advisor, provided the guidance necessary to produce this thesis; Professor Basil Rotoff who was a constant source of information and inspiration and; Dr. Neil Britton who helped me set my course and then kept me on track despite the distances involved.

I also owe an infinite debt of thanks to my parents and my family for their love and patience which never wavered. My friends, classmates, and professional colleagues have also furthered the success of this work and deserve my thanks. Through the course of my research a number of organizations and government agencies have contributed information. Their assistance is greatly appreciated though this work reflects only the views and opinions of its author.

This thesis is dedicated to Tracey Busby who has supported me in every possible sense of the word. To her, and everyone else who has helped me to surmount the many challenges of the past few years: thank you.

TABLE OF CONTENTS

TABLE OF FIGURES

CHAPTER ONE:
Introducing Two Fields

1.1. Introduction

Living in a modern city, even with its many benefits, opportunities, and advantages, still presents dangers. As cities expand in response to the pressures of growth and development they begin to encroach on areas which were previously regarded as undesirable or which may entail unforeseen dangers. Floodplains and industrial zones become the neighbors for residential subdivisions and new residents are shocked when the annual highwaters or a 'routine accident' force their evacuation. They turn to their public officials, often the disaster managers, and ask how such a problem was allowed to develop or why was nothing done to prevent it from occurring. Disaster managers do not have all the answers, certainly not all the answers the public will accept. The answers may be found in the processes which lead to neighborhoods being built where they were.

An urban area, however, is not a static collection of land-uses that were all created at one time. Communities, especially larger towns and cities, are the result of a constant dynamic process that have shaped them for years, even centuries. The initial patterns of land-use in most cities were laid down before urban planning became an established component of urban growth management and usually reflect the economic and technological forces of the time that were often beyond the control of the responsible decision-makers. Furthermore, decisions that were in the best interest of the

community or at least seemed to be at the time, given the information available to the decision-makers, may be proven to be unwise not only because they were shortsighted or ignorant of the consequences but because hazards are also dynamic. Practices and decisions that were perceived to be safe may turn out to be otherwise as the understanding and perception of the dangers involved change.

This is not meant to lay the blame at the doorstep of urban planning. Urban planning offices are busy meeting specific, and very often focused, demands of rapid population growth or attempting to encourage economic development through the implementation of land-use zoning and other policies. These demands vary from community to community, depending largely on the economic and demographic trends of the time and the often unique circumstances of the particular urban region. Some cities are facing accelerating population growth and the planning offices are pressed to provide sites and services to developers looking to cash in on the resulting higher housing values. Other cities, and many smaller rural communities, are searching for economic strategies which will allow them to sustain their populations through the periods of growth and decline in the national economy. Whether in a growing, stable, or shrinking city, residents are experiencing increases in crime, pollution, unemployment, traffic congestion and the multitude of other daily concerns which are so often associated with urban life. With so many concerns that demand the input of a modern urban planning office, it is not surprising that the attention of individual urban planners, their public offices, and the profession as a whole has been distracted from the high impact though fortunately less frequent mass emergencies and disasters which also threaten the residents.

While disaster management has not provided all the answers either, it may also be partially exonerated from blame. Traditionally, disaster managers have not been in positions to dictate how urban development is to proceed and have seldom been involved in the decision processes pertaining to location and development. To the present, disaster management practitioners have had to develop responses to likely situations only after these decisions had been made and executed. Moreover, the decisions of the urban planning office, based on order, efficiency, transportation systems, growth patterns, and other influencing factors, may have directly resulted in new concerns for the disaster manager's office.

This lack of communication and cooperation over such an interrelated concern seems an obvious shortcoming within the present system, yet both professions and their respective fields of academic study have, to a large degree, perpetuated the problem. Urban planners continue to ignore the implications which their decisions may have on urban safety; while disaster managers underestimate the importance of the urban planning office, with its zoning and land-use controls in hazard prevention and mitigation. Therefore the blame does not belong solely to one or the other but to both for failing to cooperate and for not understanding the other. This no longer needs to be the case.

No longer must disaster management practitioners face the city as it is given to them, nor must urban planners deal with the complexities of urban management without considering the more dire consequences. The answers to the difficult questions that arise after a disaster do not necessarily lie in the hands of the urban planner, even though the task of regulating current and future urban growth does. Now is the time, however, for the urban

planners and the disaster managers to share their tasks and their answers. There is a need for both to begin to work together to make the city a safer place.

The urban planner and the disaster manager share many commonalties, both in their theory and in their practice. They share a common spatial context in the urban environment; common demographic and economic factors driving locational decisions; a common need for a functioning decision-making framework; and an underlying common goal of providing for the public good. They also share many common obstacles in the planning process: fiscal restraint; the political system; public education and participation; and policy implementation. Neither has all the answers nor is one in a superior position to become a savior to the other. Both professions must continue to look to other fields of study for the solutions to their problems and to each other for common support in overcoming the obstacles which lie in their common path.

1.2. Intention and Contents of the Thesis

1.2.1. Intention

This thesis is a step toward explicitly linking the efforts of urban planning and disaster management for their mutual benefit. Through an exploration of the shared commonalties this thesis establishes that an interface exists between the two fields of study. In particular, this thesis provides support for improving the level of cooperation and increasing the amount of communication between both the academic and the practical branches of each field. Though not suggesting a panacea for urban problems, the thesis

does propose a prescription for coordinating the related efforts of the two fields to their mutual benefit.

The intention of this work is to show that urban planning and disaster management share common information bases, aims, and processes and that these commonalties must be developed for the benefit of both. That is to say, this thesis shows that: the two fields share a common fundamental goal; they employ similar means to achieve these similar ends, though this is not readily recognized, by practitioners in particular; and that a recognition of the common ends and a unification of means will enhance both practices. The thesis also points out that the current separation hinders the efforts of both fields and that they may even directly interfere with each other's progress. To overcome this interference the thesis discusses how a coordinated, symbiotic effort improves the effectiveness of both fields and that this coordination will eliminate the possibility of conflict and overlap. This reflects the organizational ecology perspective utilized in management studies to explain how organizations interact.

To fulfill this intention the thesis progresses through five logical steps which are as follows. The first step establishes the context of the discussion and its academic merit. Step two explores the theoretical basis of disaster management and urban planning, with a focus on the planning process and related aspects. The third step investigates the practical application of both fields and discusses the benefits of integration and cooperation for both practices with reference to the problem of uncertainty in planning. Step four examines common philosophical approaches: the ethical justification for intervention; the role of public participation in the planning process; and sustainability. Thus, these three central steps provide the similarities on

which the thesis builds its argument. This argument, that the two fields do share an interface and will mutually benefit from a coordinated and cooperative effort to enhance it, is developed in the fifth and final step. This concluding step also provides one possible prescriptive measure that may be undertaken to achieve a unified effort. Each of these steps is contained in a separate chapter, as outlined below.

1.2.2. Contents

Chapter One: "Introducing the Two Fields" charts the course of the thesis, outlines the theoretical approach of organizational ecology and provides an overview of the reasoning which supports its conclusions. As an introduction to the thesis, its intentions and contents, Chapter One allows the reader to become familiar with the logical framework of the entire work. It also serves as an introduction to the fields of disaster management and urban planning and offers commentary on their major concepts. The chapter discusses how the literature has begun to connect the two and then briefly samples the common issues which are apparent within the literature.

In doing so Chapter One begins the process of establishing connections between urban planning and disaster management. Having noted the current understanding of disaster, Chapter One proceeds to draw examples of literature from both fields in which common concepts and concerns are expressed. These examples are intended to assist in identifying and justifying the need for this research direction.

Chapter Two: "Identifying Common Goals" develops an understanding of the fundamental goals of each field and examines the historical and theoretical support for these goals. Furthermore, Chapter Two establishes

that the two fields share a common goal. The purpose of this inquiry is to expose the commonalties on which the argument depends. Specifically, Chapter Two examines the fundamental goal of urban planning and provides the historical context in which it has developed. Chapter Two then identifies the goal of disaster management and then discusses the definition of disasters as a social product by reviewing the current definitional debate. The chapter also explains how the different concepts of disaster and hazard management complement each other in both theory and in practice. Incorporated in this is an explanation of how natural and technological hazards, risk, vulnerability, and the disaster response phases fit into the field of disaster management. The similar features of the goal of each field are then combined to create a common goal.

With this understanding of the goals and concepts it is possible for the processes and practices of the fields to be examined. To accomplish this Chapter Three: "The Planning Process in Practice" investigates the decision-making framework which is employed by each field and their information requirements and sources. Drawing comparisons with other social problems and discussing how the urban context exacerbates some of the concerns, Chapter Three explores the mutual benefits of planning theory. The need for disaster management to incorporate new theories of the planning process and for urban planning to incorporate disaster management principles in its practice are the core of this chapter. Commonalities in the means employed by the fields establishes that the cooperation and integration of a positive symbiotic relationship will benefit both. Finally, the problem of uncertainty in planning is reviewed with special attention to the

idea that employing a proactive planning process is, in fact, a viable disaster management policy.

Chapter Four: "A Shared Philosophy" briefly studies three philosophical topics that are common to both fields. First the ethical justification for intervention is examined in reference to the concept of the public interest. The role of public participation in the planning process is then discussed, followed by a review of sustainability and environmental protection issues. This chapter supports the contention that there is an interface between urban planning and disaster management and that this interface is supported by a common philosophical outlook.

As the conclusion of the thesis, Chapter Five: "Conclusion" initiates the exploration of the idea that a safety committee may be an option for bringing urban planning and disaster management closer in practice. This stresses the need for improving the communication between the two as well as gives further support to the concept of mutualism. To close, Chapter Five provides some concluding comments and suggests future research efforts which may build on the recommendations and conclusions of this thesis.

1.3. Theoretical Perspective

1.3.1. Mutualism in the Organizational Environment

In the 1960's and 1970's the field of organizational studies turned its attention to human ecology resulting in the ecological analysis of organizations (Aldrich and Marsden 1988). This perspective introduced concepts from the biological sciences and applied them to the study

organizations yielding an understanding of organizations as organisms interacting with each other. Britton (1985) explains that "four types of interaction are generally recognized. 'Mutualism' and 'commensalism' are positive interactions, while 'competition' and 'predation' are negative interactions" (p.35). This thesis views urban planning and disaster management as being in a positive symbiotic relationship in which they have the potential to be mutually beneficial.

1.3.2. Contingency Approach to Organizations and Planning

Organizational and management studies have also produced a number of other theories regarding organizational structure and behavior. The contingency view that gained wide acceptance from among these theories in the mid-1970's (Dessler 1976; Luthans 1976; Hellriegel and Slocum 1976) has remained an important approach to organization and management studies (Kast and Rosenzweig 1985). "The basic assumption underlying [contingency] theory ... is that organizational variables are in a complex interrelationship with one another and with conditions in the environment" (Lawrence and Lorsch 1967, p.157). Kast and Rosenzweig (1973) provided the following definition of the contingency view of organizations:

> The contingency view seeks to understand the interrelationships within and among subsystems as well as between the organization and its environment and to define patterns of relationships or configurations of variables. It emphasizes the multivariate nature of organizations and attempts to understand how organizations operate under varying conditions and in specific circumstances. Contingency views are ultimately directed toward suggesting organizational designs and managerial actions most appropriate for specific situations (p.313)

This thesis appreciates that the organizational structure of both urban planning and disaster management organizations is contingent upon their multivariate nature and the complex organizational environment in which they operate. Furthermore, in reference to the concept of mutualism, this thesis examines how the two fields currently interact and how this interaction could be improved.

While the above definition of the contingency approach reflects a general understanding within the fields of organizational and management studies, the term contingency is also used to refer to other "established" approaches as well (Luthans 1976). Among these is contingency planning which is, basically, the process of asking 'what if' questions (Newstrom, Reif and Monczka 1975) and preparing solutions to be employed only when the specific circumstance, or contingency, occurs. Contingency planning is commonly used by institutions to prepare for emergencies (Barton and Wellheiser 1985) and is the basis for most disaster management practice. Its role in the document oriented approach of disaster management is discussed in Chapter Three.

1.4: Methodology

This thesis depends largely on an objective and critical review of secondary sources, presenting an unbiased overview of the current state of the fields in question as derived from the relevant literature. By doing so the thesis further justifies pursuing an understanding of the interface between urban planning and disaster management. An attempt by this thesis to conduct empirical research would be premature, given that the interface between the

fields has not yet been fully recognized. It is therefore more appropriate to proceed inductively, beginning with the general hypothesis that connections exist between the fields and that they will mutually benefit from exposing and strengthening these connections. Building support from the literature, the thesis develops more specific prescriptions for achieving these benefits.

1.4.1. Bounds of Concern

The range of information from which this thesis draws support is vast. It is necessary however, to determine bounds of concern for the thesis and thus establish a focus. The fields of urban planning and disaster management encompass a great deal of research directions and yet it is this diversity which suggests that connections are both possible and needed. While the fields are briefly introduced below (Section 1.5) and then detailed in the following chapters, it is necessary to express the limits to the research at this time.

The urban focus of the thesis is intended to direct the research to planning for populated communities, be they towns, cities, or larger metropolitan conglomerations. In particular, urban planning is meant to represent the activities which a government undertakes to control or regulate the physical and social development of the community. It is intended to delineate the field from the broader arena of the planning process that includes research in organizational and management studies. This thesis assumes a prior understanding of urban planning and does not attempt to provide a complete overview of the field.

Disaster management, as a general term for the field, is not meant to detract from hazard management nor from emergency response planning, both

distinct and vital components of the field. Disasters are large scale non-routine events which affect the entire impacted community (or a substantial proportion) and may be of natural or technological origin. The associated terms of hazard, risk, and vulnerability are defined in Chapter Two. It is important to recognize that this thesis is not focusing on events such as civil disturbances, terrorism, warfare, or economic misfortunes (except when such events may qualify as a technological disaster). This thesis does not assume a prior knowledge of disaster management and therefore attempts to provide sufficent background regarding the field to support the argument.

1.4.2. The Generic Approach

In consideration of the broad fields on which this thesis is based, it is most appropriate for this thesis to adopt a generic approach, rather than being dependent on location or cause, as both impose limitations which may hinder an examination of this scope. There is a research concern in disaster management studies regarding a dependence on the most recent experience as the focus of study. This 'prison of experience' can detract from the full understanding of general concepts. There may also be a problem in disaster management, as there is in urban planning, with transplanting the experiences of one community to another. It is more appropriate, given these concerns, for the thesis to present a general framework for establishing connections between the fields, rather than prematurely focusing on a specific site or cause.

1.5. Introducing Two Fields of Study

It is imperative that a general understanding of the urban planning and disaster management is achieved before proceeding on to discussions concerning their interaction. Therefore this section briefly presents the two fields and discusses a few key concepts which benefit from early clarification.

The two fields under consideration are identified as' urban planning' and 'disaster management'. This usage denotes a recognition of both the scope of the two fields and the need to respect the current nomenclature in order to develop an understandable and widely acceptable thesis. Other terms are used within the literature to express, or at least imply the same meaning (ie. 'city planning' in place of 'urban planning' and 'emergency preparedness' in place of 'disaster management'). There are also terms and concepts in use, in both fields, for which a firm consensus on definition does not exist.

For the sake of continuity the thesis will establish definitions of terms within the relevant chapters. The appropriate terms will be inserted in brackets when a synonymous term is included within a quotation to avoid creating confusion. None the less, it is important to recognize that both fields may use different terms in their theory and their practice. Therefore the thesis also considers the operational sense of the terms to appreciate how terms from the research are interpreted and applied by the practitioner.

1.5.2. Urban Planning

'Urban planning' is used to be indicative of a broader field incorporating both human and physical planning components. The intent of this thesis,

however, is to discuss the field of urban planning for all communities, not only those of city size.

> Urban planning represents the formal, institutional attempt to regulate the physical, ecological, and social dimensions of urban growth and structure according to specific objectives and interests (McGahan 1986, p.243).

It is important to distinguish the separation between the field of urban planning and the planning process. The planning process is inherent in many activities and in other fields of study. While urban planning does not represent the sole proprietor of the planning process the field's theoretical and academic research community has produced considerable work on the nature of the process. This is of critical concern, as much of the literature on urban planning theory involves modeling the planning process but such models may not be directly transferable to professional practice.

Within the social context the planning process must be considered in terms of its role in social change and development. To illustrate the diversity of this role Friedmann (1987) offers a list of activities in contemporary planning practice: national security planning; economic planning; social planning; environmental planning; city (urban) planning and; regional development planning. These activities occur at different levels of government, from local to national, and often require a coordinated effort between governments, private individuals and corporations. Each of these activities also entails a number of more specific tasks. The activity from Friedman's list which best describes urban planning, as it is used in this thesis, is "city planning". Friedman regards "city planning" as a field which encompasses land use management (ie. zoning, public facility location),

local transport, urban redevelopment, urban design, conservation of the built environment, and community development or neighborhood planning (Friedmann 1987).

1.5.1. Disaster Management

Disaster management is concerned with all possible strategies for anticipating, preparing, and coping with hazards and disasters, whether natural or technological in origin. Therefore the term 'disaster management' is intended to convey the broad nature of the field without unnecessarily emphasizing any single component. Although the term employs the word 'management', which may imply a reactive approach to a problem, it is important to note that the effective practice of disaster management is comprised of proactive and reactive elements.

In his inventory of disaster research, Drabek (1986) considered the temporal dimension of disasters and the actions taken by social systems in terms of four phases, each with distinct subtopics (in parentheses): Preparedness (planning and warning); Response (pre-impact mobilization and post-impact emergency actions); Recovery (restoration and reconstruction); and Mitigation (hazard perceptions and adjustments). He acknowledged that a blurry line exists between actions which mitigate disasters and those which prepare for their occurrence (Drabek 1986). Quarantelli (1988) also considered disasters in terms of four phases but employs the term mitigation differently. It is important to recognize that the intent behind the phases is similar but to also remain clear as to how the terms are used.

The concept of mitigation was defined by Drabek (1986) as "purposive acts designed toward the elimination of, reduction in probability of, or reduction

of the effects of potential disasters"(p.21). Drabek provided land-use management and building codes, techniques most often associated with urban planning, as examples of such actions. He stated that in contrast to mitigation activities, preparedness activities

> are predicated on the assumption that disasters of various forms will occur, but that their negative consequences may be reduced–mitigated, if you will, but in this special sense (Drabek 1986, p.21)

and thus divided mitigation and preparedness actions. It is critical to note that Drabek recognized that preparedness activities may be considered as a way of mitigating the impact of a disaster.

Quarantelli (1988) identified prevention, mitigation, response and recovery as the four major coping possibilities. Prevention actions are those which attempt to prevent the event from occurring whereas mitigation actions are those which attempt to lessen the harmful impacts of an occurrence (Quarantelli 1988). These terms, prevention and mitigation, correspond to Drabek's (1986) mitigation and preparedness activities, respectively. Despite the possible confusion over the use of the term 'mitigation', both authors differentiate actions which are intended to cope with a disaster's effects: prior to impact (mitigation in Drabek 1986; prevention in Quarantelli 1988); and during impact (preparedness in Drabek 1986; mitigation in Quarantelli 1988) from those which are intended to: respond to the effects of the impact (response in both Drabek 1986 and Quarantelli 1988); and recover from the impact (recovery in both Drabek 1986 and Quarantelli 1988). This reflects the general understanding of disaster phases within the literature.

In order to present a lucid discussion of disaster management issues this thesis uses the term prevention for actions taken prior to impact (as taken from Quarantelli 1988), the term preparedness for actions taken during impact (as taken from Drabek 1986), and the terms response and recovery for actions conducted after the impact (as taken from both Drabek 1986; and Quarantelli 1988). In doing so the confusion surrounding these four phases is avoided to some extent, though the terms frequently appear in other works with different intents. It is important to appreciate that lessening the harmful effects of a disaster (or in other words: mitigation) is a principal objective of disaster management in all disaster phases. Therefore the term mitigation is commonly used throughout the literature without attaching any meaning other than the standard dictionary definition.

Currently the basic, underlying premise of disaster management is that disasters are a social product (Britton 1986). "In fact, all disasters are always primarily the result of human actions. A disaster is not a physical happening, it is a social event"(Quarantelli 1988, p.156). It is the interaction between the human-use system and the hazardous event that is critical to an understanding of hazards and disasters and to the management of their consequences.

> It is difficult to separate hazards that result from perturbations in physical and biological systems from those caused by perturbations in social systems: the effects are always interactive (White 1979, p.16).

The importance of considering disasters as social products cannot be over stressed and Chapter Two details the development of this concept.

There is a classic analogy which commonly presents itself when considering the relationship between hazards and disasters and the human-use system. That is the puzzle of the tree that falls in the forest with no one to hear it. The question is transformed to ask if a tree falls and no one is hurt, is it a hazard? Four authors (1978) pose such a question as their opening gambit and a similar analogy was used by Kates, Hohenemser, and Kasperson (1985). Out of this analogy Fischhoff, Hohenemser, Kasperson, and Kates draw two concepts, the event of the tree falling and the consequences of its impact, which combine to make a hazard.

> The division of hazards into events and consequences strongly implies three possible strategies of hazard management: (1) prevention of hazard events [prevention]; (2) prevention of hazard consequences once events have taken place [preparedness]; and (3) mitigation of consequences once these have occurred [response and recovery] (Fischhoff, Hohenemser, Kasperson, and Kates 1978, p.16).

The relevant point to be drawn from this is that prevention of the event and of the consequences (strategies 1 and 2) both involve adjusting the human-use system in some manner. Three major classes of positive, interventionist adjustments, developed from the work of White and Haas (1975), are proposed by Britton (1989). These adjustment classes are:

> Modifying the hazard. The desired purpose here is to reduce potential losses by changing the harmful characteristics of the hazard agent (such as cloud-seeding) [prevention].
>
> Modifying the human-use system. the aim here is to reduce vulnerability by altering the social landscape (for instance, building levees, designing seismic-resistant structures) [preparedness].

> Reducing hazard losses through re-distributing the effect of the impact (for example, procuring insurance or developing post-impact relief and rehabilitation operations) [response and recovery].(Britton 1989, p.108)

This suggests a parallel with the three strategies proposed by Fischhoff (et al 1978). Hazard and disaster management rely on adjusting the manner in which hazardous systems and human-use systems interact, and on establishing systems to address the consequences.

As noted in brackets in the preceding two quotations, actions which fall under Fischhoff et al.'s (1978) strategies 1 and 2 or Britton's (1989) "modifying the hazard" and "modifying the human-use system" classes are preventative and preparedness activities. Such actions are proactive in nature as they require some action to be undertaken prior to a disaster whereas actions aimed at the "mitigation of consequences"(Fischhoff et al. 1978) or at "reducing hazard losses"(Britton 1989) are reactive and response oriented. Drabek admits, as noted above, that this division is not clear. Both disaster management activities, in the opinion of Quarantelli (1988), "must stress social rather than physical solutions"(p.157) and he continues in support of the idea that a connection with urban planning, with its experience in combining social and physical solutions, will be beneficial to disaster management.

1.6. The Challenge of Linking the Two Fields

The need to bring the fields of urban planning and disaster management together has been expressed from within the fields themselves. The need has also been recognized from the perspective of other fields which consider the

plight of the modern city. Legget (1973) for example, commenting as a civil engineer, writes about the geological hazards which may face a city, though his comments are insightful for all hazards. He notes that hazards

> will be rare in their occurrence, but they must be considered as possibilities in all urban planning, not in any alarmist manner but rather as a precaution that may have most beneficial results (Legget 1973, p.396).

Thus Legget makes the connection between urban planning and hazard management and suggests that hazard occurrences must be considered in urban planning, a connection which has escaped many others who are more directly concerned with urban planning or disaster management.

More recently, consideration has being given by the Organization of American States to the relationship existing between disasters and regional development planning, though the intent may be clearer than the means proposed. Based on its experience in natural hazards and regional development, the Department of Regional Development and Environment (O.A.S./D.R.D.E.) argues that

> the most effective approach to reducing the long-term impact of natural hazards is to incorporate natural hazard assessment and mitigation activities into the process of integrated development planning and investment project formulation, and their implementation (OAS/DRDE 1991, p.xi).

Here the connection is made between hazards and regional development, rather than urban planning, but the idea of integrating hazard assessment into the planning process at any scale is the essential element.

Even though a vision of connecting urban planning and disaster management is not widely shared within the literature of either field, there are a handful of important exceptions. During the past decade a few authors, especially from the disaster management perspective, have asked questions that have begun to bring such a vision into focus. White (1986) considered the uncertainty surrounding the possibility of future disaster occurrences. He asked the question:

> Awaiting a disaster, can a community combine measures to alleviate the prospective distress with efforts to reach community goals for economic and environmental well-being? (p.429)

By expressing this fundamental proposition, that a community can combine its planning for hazard mitigation and disaster preparedness with its planning for other goals, White was issuing a challenge to the researchers and practitioners of both fields. Unfortunately this question still remains unanswered and the challenge it represents has not been met.

Two years prior to White's challenge, Kartez recognized that "even the best ideas must be put into action through an organizational planning process" (1984, p.10) and that

> the key questions to be examined here are why emergency planning should be any different (from other planning efforts) and what possible contribution the field of (urban) planning can make to improving it (Kartez 1984, p.10).

Whereas White (1986) envisions disaster preparedness efforts as aiding other planning endeavors, Kartez questions the role of urban planning in achieving disaster management goals. He goes on to acknowledge that the field of disaster management may benefit from theory developed in response to other

urban concerns. Kartez closes this article, however, by noting that "seminal work in planning process theory originally was directed at the problem of organizing for uncertainty, risk, and crisis" (1984, p.20), thus recognizing that the two fields have a history of building theory upon the other's research foundations.

Kartez also linked the fields in an article written with Lindell in 1987 which builds on Christensen's 1985 work on uncertainty in the planning process. Kartez and Lindell point out that

> many community planners are not familiar with disaster preparedness, so the question of whether or not a good planning process aids preparations for uncertain futures is important if the (urban planning) profession is to contribute to that municipal function (Kartez and Lindell 1987, p.488).

By posing the question of whether urban planning efforts can contribute to disaster preparedness, Kartez and Lindell provide a complementing challenge to that of White (1986). In the above questions the concept of mutualism is apparent. White sees disaster management helping urban planning achieve goals which are not directly related to improving community disaster preparedness; and Kartez, alone and with Lindell, envisions urban planning providing disaster management with additional resources for achieving its goals.

The separation of disaster management and urban planning has been recognized as an issue by other authors in the disaster management literature. Foster (1980) stressed this point by stating that

> the most fundamental deficiency of the contemporary approach to disaster planning

> [management] is its separation from day to day decision making. ... There can be no clear-cut boundary between routine town [urban] and regional planning and disaster mitigation. Every land use decision, and indeed every social or economic policy, carries with it implications for risk. In consequence, each decision increases or decreases the potential for future disaster. It is this intimate relationship which is so frequently overlooked and, as a result, so often leads to catastrophe (Foster 1980, p.4).

Similarly, Drabek (1986) recognized weaknesses within the disaster management literature which revolved around three factors: the separation of the disaster planning process and the day-to-day planning process; an overemphasis on the production of a document rather than the planning process; and a lack of incorporation of public behavior into that process. All three of these factors reflect the fact that urban planning and disaster management share concerns: developing a process orientation and incorporating public behavior are common themes in urban planning literature.

In 1988 Quarantelli, then Co-Director of the Disaster Research Center at the University of Delaware, wrote the following passage.

> The view of disasters as social phenomena should allow them to be more readily seen as something which can be reacted to as part of ongoing policies and programmes of national or social development, which could reduce societal vulnerabilities. Activities of a developmental nature thus can be seen as an integral part of disaster prevention and mitigation. There is a tendency for the latter to be treated as a separate sphere of action and responsibility. But by stressing the social nature of disasters, it becomes much easier to plan simultaneously both for societal development and

> disasters. This link between the two activities is explicitly argued by those who say that disasters are indicators of the failure of development, and that development must be part of the process of reducing vulnerabilities to disasters (Quarantelli 1988, p.157).

This excerpt from Quarantelli (1988) contains the essential points of contention which are developed in this thesis. Disasters are "social phenomena" and social development programs can be "an integral part of disaster prevention and mitigation". Urban planning, responsible for regulating societal development, is "treated as a separate sphere of action and responsibility" from disaster management. However, there is a need to "plan simultaneously both for societal development and disasters" and thus link the two activities because "disasters are indicators of the failure of development, and that development must be part of the process of reducing vulnerabilities to disasters". This reflects the basic premise of this thesis and is indicative of the need for this research.

These views are not, however, indicative of the broad research directions of either field. Unfortunately, neither urban planning nor disaster management have committed research resources to developing the potential benefits recognized in the works referred to above. This is sadly ironic, as both have expended efforts on researching related topics which may be better approached from a common direction.

> Community physical planners would do well to incorporate risk [disaster] management more systematically into comprehensive planning, community facility planning, capital improvement programming, and growth management than is now the case in most communities. At the same time, local financial planners and risk managers

> would do well to use the information, analysis, plans, and implementation devices already available and politically acceptable in community [urban] planning (Burby et al. 1991, p.88)

It is in these efforts that further justification for actively pursuing a positive symbiotic relationship between the fields lies.

1.7. Principal Common Issues in Urban Planning and Disaster Management Literature

The themes of prevention and preparedness are common in disaster management literature. Over the past decade the literature has also shown a growing appreciation of the role which social systems play in disasters. When these themes are combined the recommended measures usually involve concepts and processes that are employed in urban planning as well as in other specific fields of inquiry such as organizational and management studies. In the case of urban planning this is understandable as it is acknowledged as an institutionalized process of regulating societal change.

In the developed world, especially in the United States (from where much of the current disaster management literature originates), floods and earthquakes are commonly singled out as hazards to which urban planning can provide prevention and preparedness strategies. In their examination of the history of flooding in Kansas City, for instance, Driever and Vaughn note that land-use zoning presented an opportunity to prevent further development on the floodplain and thus mitigate the specific hazard.

> Theoretically zoning is an exercise of the police powers of the state and its political subdivisions to

> protect the health, safety, and welfare of the people. These broad powers to protect the citizenry certainly could and should have been applied to floodplains through landuse regulations (Driever and Vaughn 1988, p.9).

The authors go on to note that in the 1920's, due to economic competition, developmental pressures, and

> a policy of cumulative zoning in which higher [order] landuses were allowed in all districts, the [Kansas City] floodplain became a mixture of heavy and light industry, warehouses, small commercial areas, and moderate- and low-income housing (Driever and Vaughn 1988, p.10).

This example suggests that land-use zoning alone is ineffective as a management technique due to the inability of the authorities to enforce the zoning regulations. This leads to a realization that utilizing urban planning techniques such as zoning and building codes are not sufficient without their intent being appreciated and enforced . Disaster management goals must become an entrenched and integral part of the urban planning decision-making process.

> Structural controls and regulations are meaningless without an understanding of a floodplain as a transition zone between two opposing sets of environmental processes, one manmade and the other natural (Driever and Vaughn 1988, p.19).

With this closing thought Driever and Vaughn enforce the need for an integration of urban planning and disaster management efforts. This need is echoed in the planning literature as well. Miller and Bachman conclude that while a hazardous location, such as an ocean shore, may have its appeal, financial institutions, insurance companies, and governments "are becoming

less willing, and even less able, to back development that fails to incorporate knowledge about [a hazard such as] coastal flooding and how to avoid its worst impacts" (Miller and Bachman 1984, p.23).

A more extensive list of planning tools which may see service in disaster mitigation and prevention is presented by Burby and French (1981). Having surveyed communities in the United States involved in the National Flood Insurance Program they reported that

> communities can employ a number of different management measures to achieve their objectives for flood hazard areas. These measures include police power regulations, such as zoning and floodproofing requirements; public land acquisition and relocation in the hazard zone to remove existing development and prevent further encroachment by urban uses; public facilities location designed to attract new development to outside of flood hazard areas (or at least not to induce new development in hazard zones); incentives to maintain low density uses in the hazard zone; and the provision of public information about the hazard (Burby and French 1981, p.291).

The importance of integrating these measures into the urban planning process is again recognized. Larger size, higher property values, and previous use of land-use management "to deal with other community problems"(p.292) were identified by Burby and French as factors which increased the likelihood of such measures being implemented by a community for hazard management. Development pressures, such as the locational advantages of floodplains for urban uses, resulting in the extensive and intensive invasion of a floodplain, may render land-use management inappropriate as a hazard management measure. While these same pressures

may lead to innovative solutions for hazard management, such as those developed for the Washington Harbour project (Sverdrup Corporation 1987), Burby and French state that

> if local land use management measures are to be most effective, they must be in place well before pressures for flood plain development begin to mount (Burby and French 1981, p.295).

This lends further support to the mutualism concept. It is a basic task of a public urban planning office to predict and manage future land development within its city. If hazards and unsuitable lands are not incorporated into this prediction and planning process early enough, the ability of the urban planning office to plan effectively may be lessened. McAlister (1973) recognized that

> Research is needed to define the various degrees of hazard to which particular areas are subject, and to define the relationship of the [natural] hazards to the various types of development that may be expected in the area (p.269).

Similarly, the job of the disaster management practitioner is increased through the likelihood of the inadvertent introduction of other hazardous technological agents or the unanticipated negative synergism of previously existing and new hazards.

This then brings the argument full circle. Effective hazard and disaster management requires urban planning techniques to be properly applied, however, urban planning techniques cannot be applied properly without an appreciation of the hazards affecting land within the city. Both practices require an understanding of the other in order to effectively interact and to achieve their own goals.

The planning techniques most commonly mentioned in disaster management literature are practiced under normal circumstances by most cities. A study conducted by Berke, Beatley, and Wilhite (1989) explored which various planning measures were being used by communities for mitigating earthquake hazards. Their results indicated that

> communities adopted a wide variety of planning measures for earthquake mitigation. The most frequently used measures ... are typically enacted for nonhazard reasons, but to some extent can be used for earthquake mitigation (Berke, Beatley, and Wilhite 1989, p.49).

Two other findings of this study showed that "planning process factors had an important influence on local efforts to adopt planning measures for earthquake mitigation"(p.49) and that "integration of seismic program formulation activities with more conventional comprehensive planning activities"(p.50) was taking place.

Another article focusing on the earthquake hazard, written by French and Isaacson, discusses the reactions of urban planners when presented with a case study involving a variety of hazard risk analysis techniques. The response from the urban planners revealed that

> market forces, infrastructure requirements, and other environmental constraints are all as important as seismic risk in determining the appropriate distribution of land uses (French and Isaacson 1984, p.520).

The respondents emphasized that, though the analysis techniques were useful, they "could not be the sole basis for setting land use policies" (p.520). The findings from these particular reports show that the concept of integrating the two fields is supported by the urban planning practitioners but

that the actual connection with hazard management has not yet been made. The conclusion to be drawn from the previous articles (Driever and Vaughn 1988; Burby and French 1981) is that urban planning measures are being applied to disaster management prevention and mitigation efforts but that for these efforts to be effective both fields must appreciate how they each influence the other. This also suggests that, even though there is a connection between the two, its significance has not yet been completely realized or that the full integration has been prevented by the existing organizational structure.

Urban planning techniques have been associated with other environmental issues for a number of years. In 1974 a report was prepared for the U.S. Environmental Protection Agency which was based on two premises:

> (1) that urbanization and land use decisions are critical determinants of environmental quality; and (2) that local level planning and decision-making, which determine the nature of urbanization processes and land use patterns, have not yet effectively incorporated environmental quality goals (Kaiser et al. 1974, p.1).

This report focuses on land use planning and its relationship to water-land use interfaces, urban design, and noise and air pollution. The report identifies a "great need" to combine approaches to environmental quality and urban planning "into a single, coordinated planning process"(p.4). The growing concern over environmental issues is becoming apparent within both fields. Of note are articles dealing with how the environmental problems of today are influencing the practice and the ethics of related fields, such as urban planning (cf. Beatley 1989; Hodge 1991; Szechenyi 1992).

Three articles from the urban planning perspective showcase the involvement of hazard management in the urban planning process. In the first report, Walker and Macgill (1985) examined a metropolitan planning authority area in the United Kingdom which was home to nonnuclear hazardous installations. The focus of the report was whether safety considerations could be incorporated land-use development decisions. Then, in 1987, Anderson recognized that urban planners are in a position to understand problems related to small-quantity generators of hazardous wastes (Anderson 1987). More recently Heiman (1990) reviewed the 'Not in my backyard!' (NIMBY) response to land development proposals. In particular Heiman focused on its relevance to the difficulties which arise in locating land uses which are required within a region but are not considered desirable by the proposed locales (ie. hazardous waste facilities). All three of these articles support the contention that issues which are of concern to disaster management, such as the location of hazardous facilities, are also of concern to the urban planning profession.

1.8. Summary

The first chapter has introduced the thesis, its theoretical perspective, intentions and contents, and the logical framework of the entire work. Chapter One discussed how the literature has recognized the linkages existing between the two fields and explored how the concept of disaster as a social product is critical to appreciating the importance of these links.

Chapter One has begun the process of establishing some of the connections between urban planning and disaster management. The above review of

principal common issues has shown that the literature of both fields contains the seeds of an integrated approach. The remainder of this thesis explores the fields deeper, searching for common roots which can be nurtured and developed into the connections that are require. Chapter One has also indicated that such a cross-pollination of ideas and theories will be mutually beneficial for both. The examples employed have assisted in identifying and justifying the need for this research direction.

CHAPTER TWO:
Identifying the Common Goals

2.1. Introduction

In order to establish an interface between urban planning and disaster management it is necessary to first understand the fundamental goal of each field and to determine if a common fundemental goal exists. Chapter Two provides the basis for this understanding through a presentation of the historic development of key theories and concepts of each field. The chapter first examines urban planning and its ties to social improvement. Then disaster management is investigated and an appreciation of the lexicon as it is used within the literature is developed. The distinction between theory and practice is noted throughout these investigations and commented on at the conclusion of the chapter. Finally, the chapter proposes a common fundemental goal and examines how this can form the basis for a positive relationship between the fields.

2.2. The Fundamental Goal of Urban Planning

The fundamental goal of urban planning is to manage, in the general public's best interest, the interaction of the human-use system and the natural and built environments. Ideally, management of this interaction is approached proactively through the process of determining courses of actions to achieve

desired futures that is planning. This goal, while broad and unrestricted, should be inherent in all planning decisions which have a potential to affect the public good.

In common terms planning is a method of making decisions which involves thinking out actions and purposes in advance. It is a process which is central in so many activities that it is difficult to precisely define. Bolan points out that "the distinguishing characteristics of planning in [dictionary definitions] focus on human thought with respect to time — planning denotes thinking about the future" (Bolan 1974, p.15). One basic definition describes planning as a

> "goal-directed decision-making process requiring the systematic provision of information and the evaluation of alternative courses of action, including the consequences of present choices for alternative goals in the future" (Goodall 1987, p.356).

A pragmatic definition, such as this, is often useful as a starting point for a discussion of the process but it is not sufficient to think of urban planning solely as "decision-making-in-advance" (Friedmann 1987, p.38). As noted in Chapter One (Section 1.5.2), planning must be considered in terms of its role in social change and development.

Over a quarter century ago Davidoff stated that urban planning can make a "unique contribution" to society by "understanding the functional aspects of the city and recommending appropriate future action to improve the urban condition" (Davidoff 1965, p.331). This was echoed two decades later by Hodge, who stated that

> a cornerstone of community [urban] planning is that it aims to promote the public interest when coping with the various problems affecting the physical environment (Hodge 1986, p.7).

Urban planning means more than simply making decisions for the future of a community. It must also incorporate an appreciation of what the desired future entails. To do this the profession must

> determine whether the actual or expected problems of development are important for the community as a whole as well as to determine how the community's interest may best be served in solving the problems (Hodge 1986, p.9).

Hodge and Davidoff have both inferred that the future that urban planning attempts to guide society towards will be an improvement over the present condition and that this reflects the wishes of the public. Urban planning strives to improve on the status quo. However, until hazard management issues are recognized in urban planning as "problems of development" the status quo will continue to include disasters.

The interaction of the human-use system and the environment is immediately evident in the physical pattern of human settlement. However, as Hodge points out, urban planning concerns

> are not limited to the design and regulation of what is often referred to now as the "built environment". They may also cover what can be called the *spatial impact* of various human actions... and the *spatial coordination* of different public policies (Hodge 1986, p.5).

The two concepts which Hodge stresses, the spatial impact and the spatial coordination of human actions and policies are more poignant when

considered with reference to disaster management. The impact of human actions, especially if not coordinated with other actions or uses, may be hazardous to both the human-use system and to the environment.

Effective urban planning not only bridges the gap between physical and social concerns, it recognizes that the two are inseparable. Urban planning must address both aspects of the interaction in order to achieve its fundamental goal. Past efforts to approach physical concerns without proper consideration of the social impacts have proved misguided.

> Relative ignorance of social and economic methods of analysis have caused planners to propose solutions in the absence of sufficient knowledge of the costs and benefits of proposals upon different sections of the population. (Davidoff 1965, p.336).

While the urban problems which instigated the development of urban planning in the past century no longer remain the driving forces behind modern urban planning,

> the persistence of these problems, together with the changing social climate and the increased economic and political powers of urban governments in the twentieth century, have fostered the development of public intervention in order to 'manage' the economic, social, and physical environment of the city. Town [urban] planning, environmental control and the provision of public housing are three of the more important aspects of this intervention (Knox 1987, p.29).

The goal of this intervention, rooted in a history of social improvement, is to influence the direction of social change with the intent of arriving at a

preferred future, or more pessimistically, avoiding the least desirable scenarios.

2.2.1. Historical Support for the Fundamental Goal

This goal of urban planning can be seen throughout the historical evolution of the field. Urban planning has a long and varied history that has been examined in detail by a number of very competent authors (Hall 1988; Hodge 1986; Reps 1965; Scott 1969; Schaffer 1988). There is a legacy of physical urban planning (Hodge 1986; Pivo, et. al. 1990) and design (Bacon 1974; Barnett 1986) dating back to the earliest cities that continues to affect the current directions of practice. The social theories upon which urban planning is founded encompass a broad range, including those of Bentham, Comte, Geddes, Marx, Mill, Saint-Simon, Simmel, and Roszak (Smith 1979; Friedmann 1987; 1988). Social movements, which developed out of these early concerns with social equality and the nature of social change, shaped the formative years of urban planning. A brief examination of two of these movements shows how the fundamental goal is firmly established in the urban planning's history.

Four public movements are recognized as having contributed to the development of urban planning in at the beginning of this century. These four movements are identified by Hodge (1986) as: public health; housing reform; conservation; and civic reform. All grew from the social and economic situations that pervailed in the burgeoning cities of North America and Europe in the 19th century. Corrupt urban politicians and powerful industrialists hindered the social reform of early cities. Despite the difficult opposition,

> "the spirit of reform had been gathering force ever since the 1870's, and as the cities increased in size and complexity, their industries multiplying, their slums spreading, and their central areas becoming intolerably congested"(Scott 1969, p.2),

the basis for urban planning was laid. Rapid growth due to immigration and industrialization had turned many cities into vast slums. These deplorable living conditions led many reformers to promote radical housing options. Some attempts, such as the New York's "notorious dumb-bell tenements" (Hall 1988, p.36) of the late 1800's, failed to improve the squalid conditions. Two other design alternatives were developed in response to the prevailing conditions. In England, at the turn of the century, public housing was incorporated in the Howard's Garden City movement as a solution to the overcrowding common in working class neighbourhoods (Simpson 1985) while Geddes' campaign for housing and social reforms eventually resulted in the first Town Planning Act in Britain in 1909 (Knox 1987). Chicago saw the birth of the City Beautiful movement which was to have a lasting impact on not only in Chicago, but on other cities around the world as well (Hall 1988). These two movements are examined below for their diverse influence on physical urban planning, though they both shared common roots in the social issues of their day.

London, in the beginning of the twentieth century, provided the backdrop for one of urban planning's most ambitious and influential movements, the Garden City. The social atmosphere was such that visionary reformers were able to attract and retain the attention of politicians and philanthropic businessmen. The Garden City movement gained support from both liberals and conservatives due to its mix of centralized planning and private

enterprise (Knox 1987) and was able to achieve limited success in Europe, but more particulary around London (Hall 1988).

> Where the garden-city concept has been most successful has been in demonstrating that whole districts of cities can be designed in a unified way in a sympathetic relationship to the natural landscape, which is essentially an achievement of Raymond Unwin and Barry Parker [two of Howard's followers] and the architects and planners they influenced (Barnett 1986, p.88).

Though the garden city has had its critics (i.e.: Jacobs 1961), it continues to influence the practice of modern urban planning and design.

The City Beautiful movement has also had its critics. "Early American planning" according to Hall "... was dominated by the City Beautiful movement, and that was planning without social purpose"(1988, p.39). The movement was originally Burnham's response to the poor living conditions of the American working class. Inspired by his success in designing the White City for the 1898 World's Columbian Exposition, Burnham proceeded to support the concept of monumental cities and was instrumental in the re-development of both Washington, D.C. and Chicago. The movement continued to develop, offering "a beautiful, rationalized city ... within the existing social, political, and economic arrangements" (Wilson 1988, p.117). Scott credits the City Beautiful movement with the evolution of urban planning in America but also acknowledges that "the emphasis on aesthetics tended to negate an earlier, more humanitarian tone" (1969, p.45) that had fostered by the social reformers.

The efficient or functional city, the antithesis of the City Beautiful (Banai 1988), was born when a group of businessmen decided to remake Boston

into a model city through the elimination of waste and inefficiency (Scott 1969). Though the Boston experiment met with little success it presented the important "possibilities of linking planning in one field with planning in others" (Scott 1969, p.117). The synthesis of City Beautiful, with its emphasis on form, and the function-oriented City Efficient was to be master or comprehensive planning (Banai 1988). Both movements promoted an overall planning approach and one feature of the City Beautiful movement which, for better or worse, became a mainstay of planning practice was land-use zoning (Scott 1969; Hall 1988). The basic framework of comprehensive physical urban planning had been established by 1920 and would remain the central guide to planning until the social consciousness of the 1960's questioned its appropriateness.

These early movements were responses to the social conditions of their time and as such may seem out of date in the modern context. They remain however, an important reminder of urban planning's roots in social change and the quest for improving the living and working conditions of the public. These roots provide the justification for contemporary urban planning's increasing involvement in areas of social change beyond the confines land-use management. Social equity and polarization, crime, the special needs of minority populations within society, and environmental protection are examples of areas of study which are now attracting the attention of urban planners. These areas, and many other specific concerns, are of interest to urban planners because they are factors that relate to improvements in the general welfare of society.

Modern urban planning continues to be dominated by the goal of securing the best future for the community. It does so through a positive, proactive

approach that is examined in detail in Chapter Three. Issues of economic and ecological sustainabilty, healthy communities and public safety are once again on the urban planner's priority list though the link to disaster management has not been firmly established. The benefits that will result from increased cooperation and integration are many and will directly further the goal of a safer future for the community.

2.3. Fundamental Goal of Disaster Management

Disaster management, in its broadest terms, seeks to protect human lives and property and to ensure the continuance of society when faced with the potential of or the occurrance of a disaster. Specifically, disaster management focuses on prevention, preparedness, response and recovery wihin the community. When a hazard is identified, disaster management attempts to prevent a disaster from occurring by taking action to eliminate the hazard. When such preventative actions are not possible, given the resources of the community and the nature of the hazard, disaster management prepares the community for the disaster with the intent of limiting the potential for harm. When an event does occur, exceeding the preparations and coping abilities of the community, disaster management coordinates a response aimed at saving victims and preventing further damage. Disaster management also assists the community to recover from a disaster.

Disaster management is essentially the combination of these four overlapping parts. These components are tied to an understanding of a

disaster as a product of human-use system interacting with the environment. This interaction may originate from natural or technological and built.

> Throughout history public policy makers have sought to anticipate the unexpected in order to reduce the risk to human life and safety posed by intermittently occurring hazardous natural and man-generated events (Petak and Atkisson 1982, p.3)

This practice is becoming increasingly difficult as the complexities of the human-use system and its interactions with the surrounding environment multiply (Lowrance 1976; Perrow 1984).

Disaster management is affected by the changing nature of the hazards that the human-use system faces. A quarter century ago civil defense strategies, primarily a reaction to the growing threat of nuclear weapons, were at the forefront of disaster management efforts and the attitudes that were formed then still influence the direction of today's organizations. This can be illustrated by an excerpt from the federal Emergency Preparedness Act that empowers Emergency Preparedness Canada (EPC) as the agency responsible for coordinating the federal government's response to emergencies in Canada. The EPC has the mandate

> to advance civil preparedness in Canada for emergencies of all types, including war and other armed conflict, by facilitating and coordinating, among government institutions and in cooperation with provincial governments, foreign governments and international organizations, the development and implementation of civil emergency plans ['civil emergency plan' means a plan, measure, procedure or arrangement (*a*) for dealing with an emergency by the civil population, or (*b*) for dealing with a civil emergency by the Canadian Forces](Emergency Preparedness Act 1988).

With its purpose thus articulated, the EPC retains a strong tie to the military and a reactive, response oriented direction. While the efforts of the EPC are focused on a wide variety of hazards, the underlying principles still relate back to responding to and recovering from a devastating event, such as a nuclear explosion. The mandate for the EPC does not encourage the more proactive preventative and preparedness efforts, but rather those of response and recovery.

A growing appreciation of the hazards that threaten the human-use system has begun to turn the practice of disaster management away from the direction set during the cold-war. Disaster management literature has begun to recognize that

> since disasters occur when the level of social tolerance to natural and man-made events is overcome, it follows that the most logical way to avoid such losses is to expand tolerance (Foster 1980, p.4).

Foster suggests that expanding tolerances requires a concerted effort between disaster management and urban planning. Disaster management organizations have not yet embraced this concept completely and the practical applications of disaster management remain rooted in response and recovery. While this approach does serve the purpose of lessening the harm inflicted by a disaster, it is important to distinguish that it only represents two of the four mitigation phases. Disaster management must also entail the obviation of disasters if it is to be entirely effective.

2.4. Theory of Disaster Management

2.4.1. Major Research Directions

Disasters are a topic of study in many fields: engineering; geography; the earth sciences; medicine; and sociology are all involved in different aspects of disaster research. The social scientific research in disaster studies began half a century ago. Today the field of study commonly turns to sociology and the behavioral sciences for the theoretical and practical basis for research (Quarantelli, 1978). Organizational theory, public administration, individual and group behavior, and cultural studies are becoming increasingly important to the field and these are some of the directions that the literature is currently pursuing. Interdisciplinary efforts within this broad research community are also providing new insights for disaster management and are being actively be encouraged. However, the challenge for disaster management is to present a unified research framework that will enable this range of fields to be assimilated. To this end it is useful to consider the lexicon employed in the current literature.

2.4.2. Introducing the Lexicon of Disaster Management

To fully appreciate the field's goal of mitigating disaster it is necessary to ask: what is a disaster? It is also necessary to consider other terms that the literature employs as a part of its vernacular. Through such consideration it is possible to highlight the significance and the variety of the definitions in the theory and practice of disaster management. This review is focused on the relevant sociology literature to provide the clearest connections to urban planning. The other research fields and their associated practices may use terms differently in specific circumstances. This review does not invalidate

these other uses but, rather, underlines the importance of establishing the context of any discussion of disaster management.

The definition of 'disaster' is not firmly established in the emergency and disaster management literature nor are the practical applications of the terms standardized. The various interpretations of this concept and of other terms that make up the accepted nomenclature have generated a growing discussion among academics in the field. The definitional debate regarding the term 'disaster' has remained an unresolved concern of the disaster management literature for the past three decades (Kreps 1989) and achieving a final answer to this basic question is impracticable at this time. Therefore this section follows the advice of Quarantelli (1987a) and attempts to achieve an understanding of 'disaster' as a principal concept.

From a review of the definitional research it is possible to obtain an insight into the directions of thought that are being pursued and an appreciation of the path that has brought researchers to their present positions. This is a critical first step towards contributing, for one must be aware of the quarry before joining the chase. It also provides the setting for a discussion of the practical implications of the definitional debate.

Disaster management, like other fields of inquiry, has both theoretical and practical sides. What may be an issue to the theoreticians may not be a current concern of the practitioner and, in practice, the professional may regard the definitional debate with some skepticism. This raises the question of how a definition effects the practice of disaster management. This is an important concern, for it is through practice that theories are tested and can help to improve the operational efforts of the practitioner.

A quarter century ago Fritz (1968), one of the early pioneers in disaster research, defined disaster for a new academic encyclopedia of social science. His opening paragraph remains the most appropriate way to begin a discussion of the term 'disaster'.

> The word 'disaster' evokes many different mental images and is used in diverse ways. In popular speech, the term is often used loosely to refer to any sudden, unexpected or extraordinary misfortune, regardless of whether it occurs to an individual, a family or other small group, a community, a region, a nation, or the entire world (Fritz 1968, p.202).

This statement contains four key points that have spawned much of the disaster literature. First, the concept of 'disaster' does elicit "different mental images" and therefore perceptions of disasters and hazards are of concern when attempting to establish its meaning (Kates 1971: Parker and Harding 1979: Mazur 1987). Second, the definition of disaster is "used in diverse ways" and it is these applications that determine the parameters of concern for the practice. The third point is that disasters are commonly considered "sudden, unexpected, or extraordinary", which leads to the discussion of the diversity and uncertainty surrounding disasters. The final point is the scope of involvement in a disaster, from the individual through to the "entire world". It is this question of involvement or degree of disruption caused by a disaster that becomes a critical component in many of the definitions. As noted above, consideration of these last two parts is based on an understanding of what a disaster is.

2.4.3. Three Decades of Defining 'Disaster'

The definition put forward in the encyclopedia entry by the sociologist Fritz (1968) incorporated many of the initial disaster research directions. This work defined a disaster as a

> an event, 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 (Fritz 1968, p.202).

The current discussion builds on this sociological definition as much now as fifteen years ago when it was referred to as the "first socially oriented definition" (Quarantelli and Dynes 1977, p.24). Dacy and Kunreuther recognized the need for interaction when they stated that "only when these natural phenomena [e.g., storms, earthquakes] cause damage to man and his artifacts can they properly be called disasters" (1969, p.3). Barton, another sociologist, made the next major contribution by introducing the concept of "a particularly intense form of collective stress situation"(1969, p.38) into the literature.

Some of the early work in the disaster field was associated with other fields. The work on the religious and social significance of the millennium by the anthropologist Barkun added to the debate. Barkun, quoting Sjoberg (1962), refers to a disaster as

> a severe, relatively sudden, and frequently unexpected disruption of normal structural arrangements within a social system, or subsystem, resulting from a force, 'natural' or 'social', 'internal'

> to a system or 'external' to it, over which the system has no firm 'control' (Barkun 1974, p.51).

While this definition does differentiate between natural and social causes, a major step towards the current understanding, Barkun later states simply that "disaster means damage–physical, social, and psychological"(Barkun 1974, p.72). Clearly the definition of disaster can be interpreted to suit the context in which it is being applied as Barkun opts to use such a broad characterization of the term.

The classes of definitions can be seen as comprising a continuum from cause oriented to consequence oriented. Four positional definitions summarised by Dynes include: geographical views that refer to the physical agent (ie.,"a hurricane is a disaster"); definitions of the physical impacts of the agent ("floods and hurricanes both damage houses but in different ways"); evaluations of the degree or magnitude of damage caused by the impact of the physical agent; and consequence oriented definitions that focus on the social disruption and the societal change brought about by the agent (after Dynes 1970, p.50).

Dynes (1970) also developed nine "characteristics of disaster agents". These characteristics are briefly: frequency; predictability; controllability; specific cause; speed of onset; length of forewarning; duration; scope; and destructive potential. These physical dimensions define areas that need consideration within the broader perspective of disaster, especially the area of pre-impact planning and preparedness. They are also widely accepted and utilized within the subsequent literature.

Two definitions of natural hazards, developed in the early 1970's, are worth considering for their contribution to the debate. First the geographer Kates identified that human adjustments are occasionally overcome by natural events.

> Thus a natural hazard is an interaction of man and nature, governed by the coexistent state of adjustment in the human use system and the state of nature in the natural events system. In this context, it is those extreme events of nature that exceed the capabilities of the system to reflect, absorb, or buffer that lead to the harmful effects, often times dramatic, that characterize our image of natural hazards (Kates 1971, p.438).

The research into natural hazards as a causal agent led another geographer, White, to report that for the purpose of his studies a

> natural hazard was defined as an interaction of people and nature governed by the coexistent state of adjustment in the human use system and the state of nature in the natural events system. Extreme events which exceed the normal capacity of the human system to reflect, absorb, or buffer them are inherent in hazard. An extreme event was taken to be any event in a geophysical system displaying relatively high variance from the mean(White 1974, p.4).

Though these definitions refer to natural hazards rather than to disaster, they both acknowledge that the interaction between the natural and human-use systems is fundamental to understanding disasters. They also point to the role a community's coping capacity plays in the concept of disaster. The similarity in their phrasing is common in the literature as one researcher seeks to build on the work of another and is especially characteristic of the definitional debate. The earlier exchangeability of the terms hazard and

disaster also diminished as their respective definitions evolved (the definition of hazard is discussed in Section 2.3.6).

The sociological definition of disaster was further refined in 1976 by Turner, a British sociologist, who recognized that disasters entailed "two sources of cultural disruption": the obvious physical disruption; and disruption of the normal social order or routine. Given this, Turner defined a disaster as

> 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 culturally accepted as adequate (Turner 1976, p.755-756).

In this definition Turner has adopted concepts of the event and the scope of involvement from Fritz but has included the idea of a threat and recognized the significance of the existing social context. Again the Turner definition is a development on earlier work.

At the time Turner's definition was published the Buffalo Creek disaster was being documented by Erikson wrote, in reference to this specific extreme event, that

> 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. Disasters customarily leave a tremendous amount of damage in their wake, of course, but we are likely to classify that damage as an 'aftermath' and assume that both the physical wreckage and the human wreckage will be repaired over a period of time. So 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, p.253).

This definition does not acknowledge the sociological factors which previous writers had associated with disaster but it does emphasize the dynamic and uncertain context in which a disaster, by any definition, occurs.

To preface their consideration of the aftereffects of disaster, Haas, Kates, and Bowden state several generalizations on which their research is based. Though they do not define disaster directly their first two generalizations do provide an interpretation of what the effects of a disaster are.

> 1. A disaster produces a sudden change in the physical components of a community
>
> 2. Combined with the physical destruction are deaths and injuries. The community can no longer function as before (Haas, Kates and Bowden 1977, p. xx)

The concept of a community being unable to function reflects back to the concept that "the social structure is disrupted and the fulfillment of all or some of the essential functions of the society [are] prevented" in a disaster (Fritz 1968). This community wide disruption becomes an important distinguishing feature of disaster definitions, especially in contrast to other social crisis occasions such as accidents or emergencies.

The interest in disaster studies has continued to grow in the past decade. Foster, a Canadian geographer, opened his discussion of disaster planning by stating that

> societies have evolved in a manner that allows them to operate within specific levels of tolerance for natural and man-made events. ... there will always remain the potential for the occurrence of extreme events, capable of overcoming the capacity of society to cope without dramatic changes in its normal operation. Such threats are

> known as hazards, and their impact on society as disaster (Foster 1980, p.1)

This definition incorporates the concept of a community's coping ability being overcome, similar to Kates (1971) and White (1974), as well as stressing the idea that the event is beyond the "normal operation" of the community. This reflects the common practitioner's view of a disaster being an event which overwhelms the available emergency services. It does, however, clearly differentiate between hazards and disasters.

This growing appreciation of the fine differences between concepts became the thrust of much of the definitional debate in the last decade. Definitions were no longer put forward as faits accomplis. Instead, the research turned to explaining the concept of disaster, a less rigorous task than attempting a definition though no less difficult. Especially important in this shift was the recognition of disasters as social products. This critical step towards a better understanding of disasters is evident in the following excerpt that considers disasters to be

> 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 processes of societies or their subunits (Kreps 1984, p.312).

The importance of linking both "causes and consequences" to the existing "social structures and processes" can not be over stressed. This is indeed the first step to developing consensus on the meaning, if not the definition of 'disaster'. For the purposes of his review of the sociological findings in disaster research Drabek (1986) uses a definition of disaster events as a

guide, a point that is stressed in his introduction. This has perhaps signalled an interruption in the hunt for a standard definition. In its place, the chase for a conceptual framework, an understanding, or a simple explanation of what is a disaster began.

Among the first to join this new quest was Britton who distinguished between accidents, emergencies and disasters in 1986. Britton retraces the path of the definitional debate and clearly shows that the underlying question has not yet been resolved. To better understand what a disaster is he suggests that events that are not a disaster should be considered. "What is required is the development of parameters, the establishment of boundaries between different levels or types of events that are associated with societal stress or crisis" (Britton 1986, p.262). The three levels of social crisis periods which Britton establishes are accidents, emergencies, and disasters. Britton identifies the nature of the three event types using three criteria concerning: the people involved; the degree of their involvement; and the disruption to the social system. He concludes this work by highlighting the importance of a clear understanding to the practice of disaster response.

The differences between accidents, emergencies and disasters are discussed further by Quarantelli who stresses that disasters are qualitatively different from emergencies. "In a disaster there is a difference of kind, not just degree, compared to what goes on in an accident or minor emergency"(Quarantelli 1987b, p.57). He goes on to identify four ways in which organizations must respond differently to a disaster. These four points, to summarize, state that 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 (p.60).

The need to determine differences between disasters is also a contention of Quarantelli. He uses criteria similar to the disaster characteristics of Dynes (1970) to make the point that the cause of a disaster is not as important as its characteristics and consequences, especially for preparedness.

The pursuit of a definition, or an acceptable understanding, has taken on considerable momentum in the past five years. This is explained by Quarantelli (1987a) as a reaction by second generation researchers to internal pressures to precisely define their terms and external pressures to conform with the concepts as applied in practice. A path towards a definition, as proposed by Quarantelli (1987a, pp.22-24), contains the following ten steps: first "there cannot be one all purpose term with a single referent which can meet all needs"; second, a concept should be developed for research and not be applied to other usages; thirdly, the concept is a "logical and definitional matter", not one of "empirical determination; fourth, the definition need not be precise, but thought of as a "sensitizing concept". The fifth point is that the definition "should be exclusively in social terms". With this Quarantelli lends support to the newer definitions that do stress disaster as a social product.

The sixth point of Quarantelli's proposed path is concerned with disaster characteristics, a point that follows from his other work (Quarantelli 1987b). In this regard Quarantelli (1987a) believes that disaster characteristics should not be confused with either the "antecedent conditions" or the "subsequent consequences". In his opinion the conditions for, the characteristics of, and the consequences from disasters are hopelessly intermingled in most

conceptual discussions. Quarantelli returns to the social emphasis in his seventh point that conceptualizes disasters as "part of social change rather than social problems". This point lends support to the concept of social continuity (Quarantelli and Dynes, 1977). The eighth point in the path suggests the use of the term 'occasion' rather than 'event' to imply an "opportunity for something to happen" rather than an outcome.

The final two points in the path deal with the idea of social crisis in disaster definitions. In the ninth point Quarantelli suggests researchers "define disasters in terms of social characteristics of responses in crisis occasions that are a part of social change". The final point urges "the conceptualization of disasters as involving collectives in which there is consensus on attempting to cope with crisis". This last point is disputed by Kroll-Smith and Couch (1992) who suggest that consensus is not necessarily present in all disaster occasions, though their focus is on specific types of technological hazards and does not reflect the broader picture.

2.4.4. Disasters as a Social Product

The theme of disaster as a social product, which was central to Quarantelli's work (1987a & b), is also key to his discussion of natural disasters (1988). In this work he states that "all disasters are always primarily the result of human actions. A disaster is not a physical happening, it is a social event"(Quarantelli 1988, p.156). This is the new, dominant focus in the definitional debate. The idea of the human-system's role in disaster is central in the definition adopted by LaPlante and Kroll-Smith (1989). They support the idea that

> disasters are defined as crisis events, the occurrence and course of which are at least

> partially determined by decisions, actions, and too often, a lack of appropriate action well within human control (LaPlante and Kroll-Smith 1989, pp.134-135).

This understanding of the importance of the social component of the definition is gaining greater acceptance within the wider disaster literature.

Britton argues that "the proposition of disaster as a social product should not be regarded as an end-product in the quest for the definitive identification of a disaster"(1986, p.260). The concept that a disaster is related to the social context in which it occurs is, however, fundamental to the current understanding of disaster from the social science perspective. From this vantage point Britton sees that "disasters produced by natural hazards are the result of complex interactions between human and environmental systems"(Britton 1989, p.107) This is not say that a disaster is a social problem (Stallings 1991), but rather to stress that disasters

> are to be placed within the broader historical context of policy and community and societal changes that resulted in certain human beings being placed into locations--both geographic and social--of high risk (Drabek 1989, p.260).

Quarantelli suggests that researchers should "conceptualize disasters as part of social change dynamics rather than social problems"(Quarantelli 1989, p.250), an idea which is supported by Short (1989). This limited concensus does not, however, signal the end to the definitional debate.

In 1989 a special issue of the International Journal of Mass Emergencies and Disasters focused on the role which classification techniques may play in disaster research and thus contributed to the definitional debate. The guest

editor of the issue recognized that asking: what is a disaster, "leads inevitably to problems of taxonomy in studies of disasters, the hazards to which they relate, and the social structures which are antecedent and consequent of both"(Kreps 1989, p.216). Kreps provides this definition of 'disasters':

> nonroutine events in which societies or their larger subsystems (e.g., regions, 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 (Kreps 1989, p.219).

This definition is then used to support an argument in favor of developing multiple taxonomies in terms of events, impacts, social units, and responses. The journal issue includes responses to Kreps, provided by Quarantelli (1989), Drabek (1989), and Turner (1989). While all three of these responding authors find some difficulty with the proposed taxonomy, there is consensus that the fundamental question remains: what is a disaster?

The diversity which Fritz identified in 1968 still remains and a quote from Britton and Oliver, originally intended for the insurance industry, sums this up.

> Large-scale impact occasions which produce unanticipated, unexpected, unscheduled, unusual and often unmanageable societal consequences are referred to by a variety of expressions. Event, danger, hazard, incident, menace, peril or threat may represent the agent of disruption. The results of their occurrences have been referred to as accident, act of God, calamity, cataclysm, catastrophe, disaster, emergency, misadventure, misfortune or tragedy (Britton and Oliver 1991, p.1).

This statement, recognizing the variety of terms that may be used in a discussion of disasters, leads to the definitional debate's implications to practice. It is clear from this though, that the theoretical side of the field is still in the process of developing consensus on the definition of disaster as well as trying to articulate just what a disaster is (Drabek 1986). This process will continue until an acceptable definition is formulated for social science research and the field realizes that no single definition will satisfy the needs of all those involved. Britton and Oliver do make the important observation that

> the definition of a disaster for the researcher (and employed by some disaster management organizations), usually incorporates a statement of scale, time and the overall degree of disruption relative to the resources of the total community (the 'demand-capability' ratio). These three attributes indicate the potential loss from disaster in terms of the community's capacity to accommodate to the impact and to consequently recover from it within a tolerable interval. Compared with some other types of social crisis occasions [presumably accidents and emergencies, as defined by Britton (1986)], the ability of a community to overcome disaster often cannot be achieved without help from additional, primarily external, resources (Britton and Oliver 1991, p.2).

This provides an excellent summary of the primary components of the current 'disaster' definition with an emphasis on the widely adopted concept of a disaster being an event beyond the coping abilities of the affected community (cf. Kates 1971; White 1974; Turner 1976; Haas, Kates and Bowden 1977; Whittow,1979; Foster 1980; Britton 1986). Thus the research, discussion and argument of the past thirty years have not yielded a final answer, but rather raised more questions by employing new terms.

2.4.5. Hazards as Potential Disasters

Inherent in any discussion of disasters and disaster management is the concept of hazards. Hazards are the potential interactions of the human-use system and the environment which would result in a disaster if the interaction actually occurred. Therefore a hazard is a dangerous event of natural or technological origin that has either not yet occurred or has occurred without sufficiently interacting with the human-use system to be considered a disaster. A community may be aware that a tornado could strike, for example, and would therefore consider tornados to be a hazard. Furthermore, a chemical spill near the community may create a toxic cloud which would also be a hazard until it either: dispersed and was no longer a hazard; or affected the town and became a disaster. Therefore successful disaster management must involve a consideration hazards.

The term has evolved in parallel to 'disaster' and has acquired unique and specific meaning within the disaster management lexicon. It is important to differentiate between hazards and disasters because their meanings are no longer considered interchangeable within the current literature. This was not always the case, however. Both Kates (1971) and White (1974) refer to natural hazards as an interaction of the human-use and natural systems in which extreme events in the natural system exceeded the coping capacity of the human-use system. In doing so they have provided a definition of disaster and have equated it with hazard. While natural hazards are undeniably linked to natural disasters, they are not synonymous nor necessarily sequencial.

An improved definition of hazard was articulated by Harriss, Hohenemser and Kates in 1978.

> Hazards are threats to humans and what they value: life, well being, material goods, and environment. Today hazards originating in both nature and technology are a major concern in developing and industrial nations alike. Coping with hazards involves a wide range of adjustments from learning to live with hazard, to sharing the burden of hazard, to controlling and preventing death, injury, property loss, and damage to human and natural environments (Harriss, Hohenemser and Kates 1978, p.6).

This definition of hazard is also significant for its insight regarding: the natural and technological origins of hazards; the international concern generated by hazards; and the relationship to coping within the human-use system. This last point is critical to the field of disaster management as the practice must entail aspects of hazard management to be entirely effective.

The importance of hazards to disaster management was reinforced by Fischhoff, Hohenemser, Kasperson, and Kates (1978, see Chapter 1, section 1.4.1 above for quotation). In their work on technological hazards they recognized that hazards are divided into events and consequences and therefore disaster management was presented with three options: prevention of the event; prevention of the consequence; and efforts to lessen the harmful effects of the consequences. The same point was made again seven years later (Kates, Hohenemser, and Kasperson 1985) demonstrating its continuing relevance.

The progression from natural hazard to disaster was expressed by Heathcote (Heathcote and Thom 1979) who employed a definition of natural hazard

that was very similar to those of Kate (1971) and White (1974). For research purposes Heathcote defined natural hazards as

> extreme geophysical events greatly exceeding normal human expectations in terms of their magnitude and frequency, and causing significant material damage to man and his works with possible loss of life. As such they were recognized to occur as an interaction between systems of human resource management and systems of geophysical events. Particularly serious manifestations of such natural hazards at specific times and places have been identified as natural disasters (Heathcote 1979, p.3).

The idea of a hazard exceeding the expectations of the human-use system is a major development on earlier definitions that did not consider this factor. Heathcote's definition recognizes that the human-use system may expect and be prepared for some natural extremes. He also relates the natural extremes to the human-use system which is likely to experience them. Thus some exterme events, such as a particularily heavy snowfall in a city which is accustomed to snow, may not be considered a hazard, whereas the same snowfall in a normally warmer city may be an extreme event for which its inhabitants are not reasonably prepared. Therefore Heathcote's definition implies that hazards are, to some extent, culturally determined and dependent on the pre-existing conditions. Furthermore, the last sentence of the above quote identifies a natural disaster as a manifestation or an actual occurrence of an interaction between the human-use and natural systems that has resulted in harm to the human-use system. This begins to establishes the distinction between a hazard and a disaster.

In the same book (Heathcote and Thom 1979) White introduces an interactive model of natural hazards using examples of events to support his

ideas. For White natural hazards are "any extreme events in natural systems which have the potentiality of causing major perturbations in social systems"(p.15) and White finds it "difficult to separate hazards that result from perturbations in physical and biological systems from those caused by perturbations in social systems: the effects are always interactive"(p.16). Thus White reiterates his earlier position that natural hazards are the result of an interaction between the human-use and natural systems (White 1974). White also recognizes that "if a society uses a natural system such as water or land, it generally does so because of some long term average net benefit" and that these "benefits may be changed to disbenefits or losses by the extreme event"(p.16). Therefore, in White's interactive model, "the hazard results from this tradeoff of potential benefits with the costs of the adjustment and the uncertainty of the magnitude and time of occurrence of any particular extreme"(p.16).

The important role of the interaction concept was highlighted by Burton, Kates and White (1978). They wrote that

> although the hazard results from the interaction of natural and social systems, the two cannot be equated as causes. Natural systems are neither benevolent nor maliciously motivated toward their members: they are neutral, in the sense that they neither prescribe nor set powerful constraints on what can be done with them. It is people who transform the environment into resources and hazards, by using natural features for economic, social, and aesthetic purposes (Burton, Kates, and White 1978, pp.19-20).

This statement places the onus on the human-use system for creating hazards by exposing itself to the extremes of nature.

A similar understanding of natural hazards and resources is put forward by Parker and Harding who stated that

> natural hazards are extreme natural events which, when interacting with social systems, produce negative or damaging effects. Natural resources are the beneficial effects of such man-environment interactions. Both human use and natural event systems are necessary for the creation of natural hazards and natural resources, and often the pursuit of resources creates hazards (Parker and Harding 1979, p.307).

Crozier (1981) defined a natural hazard as being "brought about by a degree of exposure to an environmental agent for which the community is not totally prepared"(Crozier 1981, p.106). With these definitions, and the support of White's interactive model, it appears that a degree of consensus had been reached on the definition of natural hazard by the beginning of the 1980's. The next phase in the evolution of the concept was the question of hazard origin.

The literature produced in the 1980's began to differentiate between hazards on the basis of their origin. Hazards were described as either natural and technological, though their commonalties were not forgotten.

> Both types of hazards [technological and natural] are commonly regarded as potential sources of physical and psychological discomfort, which people attempt to reduce through a combination of cognitive and behavioral adaptations (Preston, Taylor and Hodge 1983, p.144).

It is worth noting that the physical and psychological aspects are identified separately in this definition and that adaptations may be cognitive or behavioral. The process of differentiating between natural and technological

hazards created a need for a fundamental definition of hazard that was not linked to nature. Thus hazards were defined as "threats to humans and what they value"(Kates, Hohenemser, and Kasperson 1985, p.21), specifically: "life, well-being, material goods and environment"(Kasperson and Pijawaka 1985, p.8).

Technological hazards are conceptualized by Kates, Hohenemser, and Kasperson (1985) as

> causal sequences of events that originate in human needs and wants and evolve in time to choice of technology, release of energy and materials, and possible human harm. Central to this idea of hazard is that technology, in its normal operation, may release energy or materials with sufficient intensity/concentration to threaten or cause harm (Kates, Hohenemser, and Kasperson 1985, p.21).

This builds upon the understanding of hazards as a sequence of events and consequences (Fischhoff, Hohenemser, Kasperson, and Kates 1978). The appreciation of the beneficial aspects of what may be a hazardous activity is noteworthy when compared with White's interactive model. These definitions also share a common implication that a natural or technological event is solely related to a natural or technological hazard or disaster. This is not necessarily the case as "few hazards [or disasters] can be characterized as exclusively natural, social, or technological in origin, since all these elements interact in most real situations"(Tuller in Kates, Hohenemser, and Kasperson 1985, p.157).

This interactive concept of hazards was further explored by Ericksen and Barbour (1985) who defined hazard as the "potential for disaster"(p.132) and stated that a

> natural hazard is the *relationship* that can be seen between a potential natural event in a given area and the actual or potential human occupation or use of that area (Ericksen and Barbour 1985, p.132)

This was represented in two Venn diagrams (Figure 2.1), the first of which depicted a natural hazard as the overlap of a potential or actual human use and a potential extreme natural event. The second diagram shows actual human use and an actual extreme natural event with the overlap described as a disaster.

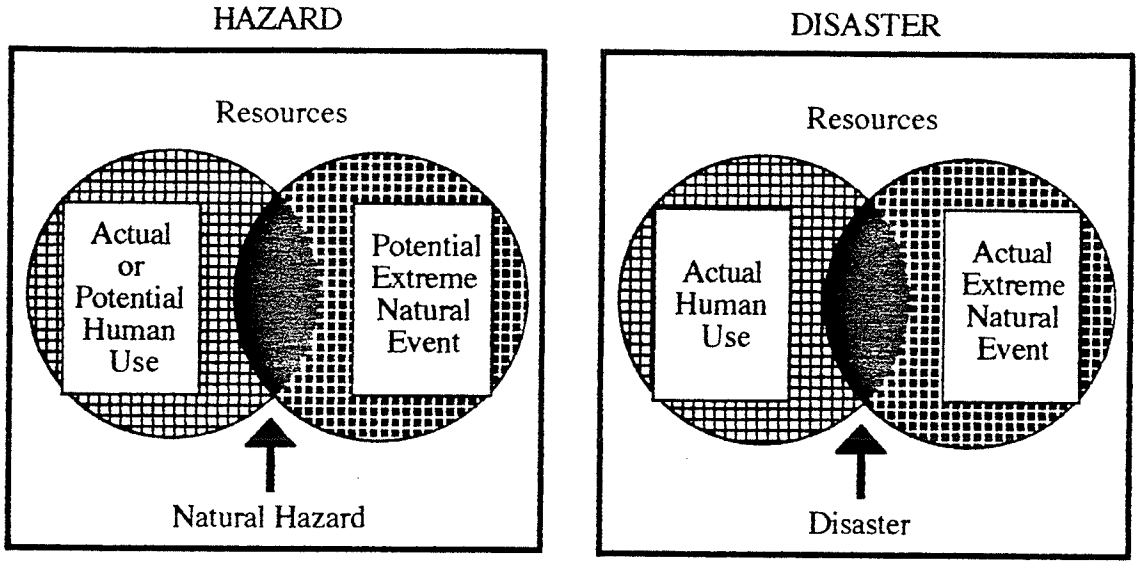

FIGURE 2.1
(After Ericksen and Barbour 1985)

The authors also recognize the dynamic nature of hazards. This concept is worth considering as it has important implications for urban planning. The argument forwarded by Ericksen and Barbour is that

> if the hazard is the interaction between the potential natural event and the human use (actual or potential) of the area in question, then any change of scale in either event or use will alter the effect of the hazard. Thus, the hazard is both dynamic and functional (Ericksen and Barbour 1985, p.132)

Given this, it is reasonable to suggest that managing changes in the human-use system is a viable method of managing hazards.

Britton and Oliver have differentiated three hazard origins. In their view hazards can be:

> [1] [of] natural origin; [2] those associated with failures or misuse of technological processes; and [3] those arising from the misapplication of technology, medicine or biology to inadvertently or intentionally cause harm to other people (Britton and Oliver 1991, p.3)

The remainder of this work, which was produced for the insurance industry, focuses on the first two hazard origins. The authors point out that one difference between natural and technological hazards is that the former results from a lack of control whereas the latter results from a loss of control. They also recognize that many natural hazards are of questionable natural origin, due to the major role that interaction with the human-use system plays in creating a hazard.

While the common aspects between natural and technological hazards have increasingly prompted the disaster management field to adopt an all-hazard approach, Britton and Oliver (1991) consider the two hazard origins separately because the distinct qualities of the two hazard types are of direct relevance to those organizations involved in hazard adjustments (such as the

insurance industry, disaster management agencies, and community and urban planners). Another approach to the differences between disasters of natural and human origin was taken by Baum (et al 1992) in a study of the chronic stress in a community following events of both types. The results of this preliminary studied support the idea that there are significant differences between natural and technological hazards and disasters.

2.4.6. Risk as the Probability of Disaster

For a possible event to constitute a hazard there must be a chance that the event will impact a vulnerable community. Risk is the probability of a particular event impacting a particular community. While some researchers have presented different interpretations of risk (cf. Burton, Kates, and White 1978; Boughton 1991), it is this reference to the likelyhood of an event occuring that has the widest acceptance. Kates, Hohenemser, and Kasperson defined risk as "quantitative measures of hazard consequences, usually expressed as conditional probabilities of experiencing harm" (1985, p.21) though this was expanded by Slovic, Fischhoff, and Lichtenstien to "include a wide range of cognitive dimensions that extend well beyond [this] idea of risk" (in Kates, Hohenemser, and Kasperson 1985, p.91).

More succinctly, "risk, as differentiated from hazard, may be thought of as the probability that a particular technology or activity will lead to a specific consequence over time or activity unit"(Kasperson and Pijawaka 1985, p.8). This definition of risk is independent of the origin of the hazard as the activity involved may simply be the occupation of a particular area. Similarly, Lawrence defined risk as the probability that "a potential situation [a hazard] which will cause damage to people, property and environment" (1981, p.109) will be realized. White explains that

> any natural system is subject to fluctuations producing extremes for which reoccurrence probabilities can be estimated on the basis of recorded experience or hypothesized combinations of future events (1979, p.16)

and thus provides the basis for risk assessment which is an important component of disaster management. For the purpose of this thesis it is sufficent to understand that risk is the probability that a hazard will be manifested as a disaster.

2.4.7. Vulnerability and At-Risk Communities

Risk, however, should not be confused with vulnerability which refers to the resources and coping abilities of a specific community to a specific hazard. The effects of a disaster are relative to the affected community's resources or vulnerability. Disasters of similar intensity may cause harm to different degrees depending on the vulnerability of the community, or the portion thereof, that is affected. 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

There is an erroneous view that not only do "bigger places have more resources—social, economic, human, political—with which to deal with disasters" (Wright et al 1979, p.206) but that these resources are equally distributed throughout the community and are equally accessible to all the inhabitants. This, unfortunately, is not true. Large communities are not socially and economically homogenous but are rather a collection of different groups, sometimes geographically linked, as in an urban core neighbourhood, sometimes linked by a common disadvantage. Disasters do not treat everyone as equals and therefore disaster management strategies

must also place more emphasis on those who are in greater need of coping assistance.

While a community which is unprepared for or vulnerable to a particular disaster is often referred to as being an at-risk community, this reflects the fact that similar events will affect communities differently rather than the statistical likelyhood of the event occurring. It is important, however, to also understand that a community may be considered at-risk because its social position, and thus often its geographical location, exposes it to more hazards. This is particularily true of lower status communities within a larger urban setting being exposed to technological hazards.

2.4.8. The Definitions in Practice

As introduced above, the manner in which various terms, concepts, and definitions are applied in the practice of disaster management has significant implications for the effectiveness of that practice. Furthermore, this variety is more pronounced if the other influencing fields of study, such as engineering or the earth sciences, are included. The practitioner is faced with widely diverse interpretations of what a disaster is, what is entailed in identifying a hazard, and how to determine risk. The amount of discussion and even controversy surrounding these definitions is likely to lead the practitioner to a rationalization that it does not matter how the academic literature defines disasters or hazards. It may be assumed by the practitioner that a disaster will be obvious when it happens and its title is irrelevant. This one of the major implications arising out of the definitional debate, although the consequences of an appropriate definition are much more important than the words or syntax. The selected definition orientates the type and degree of resoures made available to the practitioners by the government.

One reference document recently produced in Ontario (Ontario Ministry of the Solicitor General 1991) provides an example of how the definition and understanding of terms can directly affect the direction and effectiveness of disaster management practice. The introduction of this guidebook distinguishes between prevention (ie., efforts which reduce risk) and planning (ie., efforts which reduce the seriousness of the consequences). While this does reflect the recognition of events and consequences which is present within the literature (Fischhoff, Hohenemser, Kasperson, and Kates 1978; Kates, Hohenemser, and Kasperson 1985), the booklet goes on to distinguish events which can be prevented from those which cannot. Technological or "man-made" events are listed among the preventable situations while natural events or "Acts-of-God" are primarily unpreventable. This approach fails to recognize the role of the human-use system in the causal sequence of hazard (Kates, Hohenemser, and Kasperson 1985), and thus eliminates one course of prevention.

This view of natural disasters as solely "Acts-of-God" is partially contradicted later in the booklet, when increasing population density is acknowledged as a reason for increasing levels of risk from natural events. Despite this, the connection between limiting the exposure of the human-use system to a natural hazard and thus lessening the risk of a disaster is not made. The guidebook does note however that the increasing complexity of modern society, especially in terms of its dependence on technology, is another contributing factor to the growth in the number of hazardous situations, an attitude that is also supportable within the literature (Perrow 1984).

Adding to the confusion generated by these conflicting interpretations of hazards and disasters, the booklet defines an emergency simply as "a major event which requires a co-ordinated response from a number of agencies"(Ontario Ministry of the Solicitor General 1991, p.3), a definition which could be applied to almost any large event. These points demonstrate that defining and understanding terms is crucial to effective practice. The term 'emergency' is widely used within the practice as a more encompassing adjective than disaster (i.e., emergency measures organizations; community emergency plan; Emergency Preparedness Canada). In this regard the term 'emergency' is used as a synonym for disaster and should not be strictly interpreted as it is in the disaster management literature (i.e., Britton 1986).

Another pressing concern of the disaster management researchers is that the practical side of the field will become too focused on technological fixes to the physical and locational problems associated with hazards (Britton 1991). The social emphasis that is currently gaining acceptance within the literature must be carried into practice to balance this physical orientation. To this end Quarantelli states that "prevention and mitigation [preparedness] must stress social rather than physical solutions" (1988, p.75) and that a proactive planning process is a key component to achieving the goals of disaster management.

The definitional debate also figures in the development of the goals of disaster management. Without an acceptable definition, or at least an open-minded understanding of the concepts entailed in a definition, the practitioner will not be able to achieve consensus on the goals nor the technology to employ. Without agreement on the goals and without knowledge of the appropriate technologies to achieve those goals, the

disaster management practitioner must take on the task of problem finding (Christensen 1985; Kartez and Lindell 1987). This is a situation that is also common in the field of urban planning.

Thus the need for an appreciation of the problem becomes a key to developing goals and determining appropriate solutions or technologies. This alone should be sufficient to convince the skeptical practitioner that it is not enough to recognize a disaster when it arrives. Recognition of the uncertainty involved in problem finding and developing goals and solutions, depends upon establishing what a disaster is prior to its occurrence.

The definitional debate figures into the practice of disaster management in a very fundamental way. In order to plan or manage something effectively it is necessary that there be a clear definition of both the problem and the solutions. This does not mean however that the practitioner must rely on the theoretical literature for precise definitions of the terms involved, only that consideration is given to the concepts, as promoted in the literature, prior to establishing functional definitions. Given this, and the current position of the definitional debate, it is reasonable to assume that disaster management practitioner will turn their efforts to the social aspects of disaster and ally themselves with other professions, such as urban planning, who deal with similar issues.

Such a change in view regarding disasters will reflect the literature's current direction of shifting responsibility for disasters from 'Acts-of-God' to the intentional decisions of society that place the human-use system at risk. If this view is adopted, disasters may be seen as inevitable outcomes of the past accepted decision-making process. The means to eliminate, or at least limit

hazards in the future will be more obviously found in adapting the decision-making process, rather than developing methods of reacting to its failures.

2.4.9. Summary of the Lexicon

The question of what is a disaster remains unresolved though the importance of developing an understanding of disaster has been established for both the practitioner and the academic. The dual nature of the definition of disaster needs to be recognized so that the linkages between theory and practice do not become tangled in semantics. The implications of the definition to the problem of uncertainty make the definition a critical component in resolving one of the underlying issues in disaster management practice.

The definitional debate must also be resolved so that social research can begin to utilize a standard understanding of the term 'disaster' and therefore eliminate the need to preface research with explanations of how the term was employed. When consensus on this has been obtained the field of study will be in a better position to explore its internal issues and to expand its efforts to address external issues. This will insure that disaster management can achieve its current goals and increase its mandate in the future.

Disasters and hazards are products of the interaction of the social human-use system and the natural and built environments. A hazard is an interaction that has a potential for causing harm whereas a disaster is when such an interaction actually results in harm to the human-use system. While the intricacies of defining these terms have been discussed above, the fundamental basis for modern disaster management is that disasters are a social product.

It is impossible for the human-use system to exist without interacting with the natural environment from which it draws its resources. Furthermore, it is impossible for society to separate itself from the built environment that is the result of previous human activity. The human-use system is inevitably and irrevocably intertwined with the processes and events of the environments in which it exists and therefore the management of this interaction must be an ongoing process. Disaster management is the human-use system's attempt to control and to mitigate the nocive aspects of these interactions.

Disaster management theory, rooted in sociology and other social sciences, remains an underutilized resource in practice. The need to better appreciate the nature of hazards and disasters is fundamental to achieving success in practice. The current document-based, emergency response orientation of the practicing disaster manager must be adjusted to incorporate a planning process aimed at the obviation of hazards. This need for integration is further developed in Chapter Three.

Disaster management, in both theory and practice, is faced with two future paths: maintenance of the status quo with the risk of stagnation and increasing irrelevance; or movement toward achieving a more progressive, proactive approach to the planing process. The theoretician can continue to examine the social aspects of disaster as a means of gaining insight into social processes without attempting to translate these efforts into practical suggestions. The practitioner can continue to focus on picking up the pieces of society after a disaster rather than protecting the whole society in the face of hazards. While these future courses may yield some satisfactory results, they are limited by their goals. They do not represent growth and improvement within the field. Disaster management has a critical role to

play in guiding the activities of the human-use system and in influencing its interactions with its environments. As an applied study area, in theory and in practice, disaster management must recognize this role before it can fully achieve the goal that is inherent in its name.

2.5. Identifying a Common Fundemental Goal

Given the fundemental goals of urban planning and disaster management it is possible to conceive a common goal between the fields. To recapitulate briefly, urban planning is essentially concerned with managing the interaction between the human-use system and the environment in which it operates. The theory of planning is to identify desired future outcomes of this interaction and to promote positive actions that will lead to preferred results. The proactive nature of the planning process is often hindered in practice by the many external forces which influence the decision-making process. However, the fundamental goal of urban planning remains one of guiding and controlling the interaction between human activities and the environment within the framework of the existing social, environmental and political constraints.

Disaster management, on the other hand, seeks to address only the potentially harmful outcomes of the same interaction process. Disaster management's approach to the interaction focuses on prevention, preparedness, response, and recovery. While the reactive strategies of response and recovery are allocated more attention in practice than the more proactive prevention and preparedness efforts, the underlying goal of all disaster management efforts is to lessen the negative outcomes of the

interaction and, in doing so, lessen the potential for harm to the human-use system.

Hence, both urban planning and disaster management attempt to secure a better future for the human-use system of which they a part. Urban planning pursues this goal by identifying and encouraging positive outcomes from the interaction of the human-use system and the natural and built environments, whereas disaster management identifies and attempts to deflect the negative outcomes of this interaction. However, successful disaster management, without the intervention of urban planning, only insures the maintenance of the status quo in the interaction and is unlikely to achieve full success in its proactive prevention efforts. Similarily, urban planning which fails to recognize and incorporate the efforts of disaster management in its decision-making process is in danger of being set back by a negative outcome and, at worst, of increasing the risk to the human-use system. Only through integration and cooperation can urban planning and disaster management both achieve their fundamental goal of providing a better, safer future.

Urban planning and disaster management share a common goal, one of the basic requirements of an interface between two fields of study. An appreciation of this shared goal leads, in Chapter Three, to the examination of the common means and methods employed by each field. This will expose opportunities to improve the effectiveness of both efforts through an exchange of theories and practices and through the possibility of increased coordination of activities.

CHAPTER THREE:
The Planning Process in Practice

3.1. Introduction

This chapter introduces the commonalties between the practical applications of urban planning and disaster management and recognizes the possible benefits of these commonalties. It begins by examining the current practice of disaster management with special attention to the contingency planning process. Having identified the potential for improvement in disaster mangement's approach to planning, it is then easier to develop the benefits of intergating disaster management with urban planning. The practice of urban planning is then briefly reviewed to establish the commonalities and to further explore the mutual benefits of a proactive planning process aimed at achieving the common fundemental goal of the two fields.

The role of planning theory is examined in respect to the benefits that may be realized through an increase in interaction between the fields. Theories *of* planning, the normative theories of how to plan, are discussed as a means of improving disaster management. The importance of incorporating disaster management's concerns into theories *in* planning, the substantive theories on which urban planning decisions are based, is then explored. This exchange of theory is critical to the achievement of the common fundamental goals of the two fields and is the most important point to be raised by this thesis.

The task of coping with uncertainty is examined from the perspective of both fields. Again the mutual benefits of an integrated approach to this problem are highlighted. Thus Chapter Three, through this discussion of shared practices and the potential benefits of coordinating these efforts, further establishes that an interface exist beween the two fields.

3.2. The Practice of Disaster Management

The theory of disaster management has been discussed in Chapter Two and its relevance to practice has been established. However, the current practice of disaster management does retain some aspects that are worthy of separate discussion. Not all the research theory is adopted into practice, nor are all the practical techniques backed by research and therefore it is useful to examine some of the dominate practical trends. Two major themes are to be considered: the importance placed on producing documents in the current practice; and the information sources for planning.

3.2.1. Contingency Planning and the Emergency Plan

The practice of disaster management currently employs single-use contingency planning, as discussed in Chapter One, for the preparation of disaster or emergency plans. Contingency planning, an approach which is common in organizations which face uncertainty, is "the preparation, in advance, of a course of action to meet a situation that is not expected, but that, if it transpires, will have a significant impact" (O'Connor 1978, p.13). The actions incorporated in the plan are to be taken only when the contingency, for which they were specifically developed, occurs. Contingency planning does not actively pursue alternatives to possible

circumstances but, rather, predetermines appropriate responses. In this sense contingency planning is reactive though it does assist disaster management practitioners in their preparedness and response tasks.

Contingency planning usually results in the production of a documented plan. In the case of disaster management these documents are intended to provide a community with "definite and functional plans for the most efficient and effective use of resources in times of emergency" (Emergency Preparedness Canada 1988, Document 1009, p.1). The profession of disaster management, as a result of the importance attached to these documents, remains focused on responding to the consequences of a disaster rather than on other possible options, especially in the prevention and preparedness phases. The introduction to a community emergency plan is likely to include a statement such as:

> this document will not prevent nor reduce the possibility of an emergency occurring. It will aid in providing a prompt and co-ordinated response, thereby reducing human suffering and loss or damage to property and the environment (Town of Selkirk, 1988, p.1),

which establishes the intent and limits of the plan.

The contingency planning approach to disaster management limits the consideration of actions which may be taken prior to a disaster occasion. Such preventative or preparedness actions would be in response to recognized hazards but the disaster management practice has not fully acknowledged hazards as separate phenomena. Instead the practice considers hazards only as disasters-in-waiting or "potential disaster

situations"(Emergency Preparedness Canada 1988, Document 1009, p.1) and will not respond to them until they are manifested upon the community.

Contingency planning is the focus of an article examining transportation disruptions (Meyer and Belobaba, 1982). The authors submit three characteristics of the contingency planning process which may be paraphrased as:(1) a contingency planning effort can become politicized because of "the political nature of most crises"; (2) there is an "emphasis on crisis management and program implementation"; and (3) "crisis situations often present unique opportunities to implement actions which under normal circumstances would not be adopted" (p.464). These characteristics complement the suggestion derived from Kartez (1984) that contingency planning may be another link between the fields of urban planning and disaster management.

The efforts of a disaster management office are commonly divided into three stages: research and planning; education and training; and emergency operations. Unfortunately, these stages may be better described as: determining responses; practicing responses; and responding. The research stage attempts to identify the "potential disasters", to inventory the available community resources and to assess all foreseeable needs. The planning, based on this research, aims to clarify and co-ordinate the assignment of responsibility for specific positions, tasks, and functions. Standard operating procedures, lines of authority and succession, and other logistical concerns are also addressed in the planning stage.

The Manitoba Emergency Measures Organization presents its planning process as consisting of eight steps:

1) deciding to plan
2) appointing an emergency coordinator, usually the community's chief executive officer
3) appointing a planning committee, usually consisting of members of the emergency services and selected elected officials
4) preparing the emergency plan
5) approval of the plan by the community's local government, usually the town or municipal council
6) publishing and distributing numbered copies of the approved plan to only those persons who have a direct need for a copy
7) informing and educating the public of their expected role in the event of an emergency
8) begin training responders to use the plan and exercising the plan to test its effectiveness

(Lindsay 1992)

While this type of document preparation procedure is a form of decision-making-in-advance, it is not a process for making proactive decisions to influence future events. It is, rather, a process for preparing reactions to possible future events.

The training and education activities of the disaster management practice are focused on preparing the emergency measures staff to operationalize the emergency plan. Training is often supplied through higher levels of government and is usually targeted to specific positions within the government. For example, Emergency Preparedness Canada offers courses to elected municipal officials and to emergency planning staff, though not jointly. Any public education efforts are aimed at insuring that the directives and recommendations of the emergency measures organization are followed in times of emergency.

In current disaster management practice the public is not normally involved in the planning process, nor is the public consulted in the co-ordination of emergency response. Elected officials are involved as representatives of their constituents, but this does not fully meet the needs of public involvement. While the public does have a contribution to make to disaster management and an informed population is better prepared to cope, the practitioner is often constrained by a lack of resources to capitalize on the benefits of public involvement.

While public involvement is not always easy to garner, issues which may affect the property values or the residential nature of a community are more likely to attract the attention of the involved residents. Disaster management is increasingly concerned with such issues and therefore a lack of public interest is not a valid excuse for not offering more opportunities for involvement. Disaster management is in an excellent position to access the resources represented by active public support but needs to develop and implement policies to encourage public involvement.

The plan, as developed and practiced, is put into operation only in the event of an emergency. The emergency plans developed by most cities are primarily a framework in which the response activities of the various municipal departments are conducted. Inherent in this is the establishment of a control committee that will oversee the responses of the municipal departments. Each department is expected to have prepared and practiced its own standard operating procedures and the task of the emergency plan is to co-ordinate these responses and thus increases the effectiveness of the response.

Emergency plans do serve a very important purpose in the practice of disaster management. They achieve their aim of co-ordinating the response to an emergency and thus minimize the harmful effects when an event occurs. They are not, however, the only method of managing the interaction between the human-use system and threatening environmental events, whether of natural or human origin. For disaster management to attain a higher level of success it must investigate methods of preventing hazardous events from having an impact on the human-use system. It must also recognize that "emergency planning is a process, not a product" (Ontario Ministry of the Solicitor General 1991, p.5). While there are signs that this attitude is gaining some acceptance, it is imperative that a process orientation be adopted throughout the practice.

3.2.2. Information Sources

Disaster management must seek out a broad base of information on which to develop its policies. Both physical and social factors must be considered before determining the appropriate actions to be undertaken. Disaster management must turn to various physical sciences disciplines such as: climatology, for historical extremes and estimated re-occurrence periods of climatic events; topographical studies, which provide insight into the relief and terrain of an area and may expose floodplains or avalanche zones; and the earth sciences including geology, seismology, vulcanology, and hydrology. All of these fields may claim their own vast bodies of research literature. The practice of disaster management does not need to incorporate all of this information but must be prepared to utilize it as a resource in planning efforts.

The human or social factors which influence disasters are as diverse as the physical. Demographic, political, cultural, and economic factors may all play a part in determining which portions of the human-use system and which populations are most at risk from particular hazards. Practitioners must be prepared to consider these factors in all phases of disaster management.

Past experience, while an insufficient basis for future decisions, does provide examples of when overlooked social factors have affected the success of disaster response activities. On October 17th, 1989 the Loma Preita earthquake rocked the San Francisco/Oakland area of California. According to Henry Renteria, the Emergency Services Manager in Oakland, this earthquake resulted in the loss of 95% of Oakland's low income housing, mostly older hotels of vulnerable brick construction built before the introduction earthquake zoning and construction regulations (Lindsay 1991).

Partially as a result of this influx of low income citizens, who lacked the fiscal and social resources to cope with their loss of housing, the temporary shelter system was overwhelmed. High school gymnasiums were designated as relief shelters but were intended for 3 to 5 day occupations while victims arranged alternative housing. The actual events dictated that some shelters remained open for over 60 days and saw their populations triple, rather than decline. The difficulties of coping with the numbers of homeless were compounded by street gangs, prostitution, and other vice activities that flourished in the shelters.

In Renteria's opinion, this sheltering problem was not indicative of Oakland's overall response or resources (Lindsay, 1991). Prior arrangements insured

an adequate food supply to the shelters and other needs were met through donations. The problems arose from failing to target the appropriate at risk population and, instead, planning for a portion of population that was not as likely to require extensive support. This example demonstrates how social factors, such as housing stock and fiscal resources, are as important to successful disaster management as are the physical factors that encouraged the adoption earthquake proof building codes for new construction.

If disaster management is to be successful in going beyond its present response orientation it must begin to incorporate the social factors into a proactive planning process. By recognizing these social factors the interaction between the human-use system and the natural and built environments may be better understood and therefore easier to manage. Many of the same factors may also influence the scenarios that are the basis for the current contingency planning approach and therefore improvements in gathering and interpreting such information will aid this aspect of disaster management as well.

3.3. The Practice of Urban Planning

Urban planning is now an accepted component of managing society's growth and future. Through the application of a planning process, practitioners are able to determine and initiate a course of action which is seen as the most likely to yield the desired result. There is no firm concensus on the ideal planning model in either urban planning theory or practice. Most planning models are built around a process of goal setting, action development, implementation, and review.

Hodge (1986) discusses one such model of the planning process which he refers to as the community planning model. Although it is not the only, nor necessarily the best planning model, it does exhibit the primary componets to be found in other models. According to Hodge, community planning "is the process of a *community* deciding upon its future environment" and furthermore, "community planning is not just planning *for* a community, it is equally concerned with planning *by* a community" (1986, p.315). The community planning model described by Hodge, while a simplistic representation of the proactive planning process, is well suited to the purpose of understanding the planning process even though it may not be fully realized in practice.

The general model of the community planning process begins when the community expresses a need to improve its environment. While in theory this need may be based on conjecture, in practice it is usually in response to unacceptable conditions. Ideally there is concenus on this need and the process can proceed to identify the problems which underlie the expressed need. With the problems recognized it is possible to articulate goals. These goals are often in the form of desired futures which the community would prefer over either a continuance of the current situation or over further decline.

In order to successfully set reasonable and achievable goals it is important to survey the current community conditions and make predictions on how these conditions will develop in the future. With this information it is possible to design alternative plans to suit future conditions that can be compared and evaluated. From among these alternative plans one preferred plan is then adopted. This process does not mean that only one alternative is viable but

rather that one alternative preferred over the others, given the available information and resources. Nor is the selected plan limited to a static set of recommendations or prescriptions laid out in a document. The successful plan must include a program of implementation and a timeframe for its proposed actions. Thus planning is a dynamic, procative process which is concerned with determining a course of actions to be implimented to either resolve a problem or to ensure that a possible problem does not arise.

There are also feedback loops built into this essentially linear process. Ongoing monitoring of current trends assists the practitioner in developing practical alternatives and reviewing outcomes of the implemented plans provides information that is useful in evaluating further proposals. This review step links implementation back to problem identification and goal articulation thus allowing the practitioner to make necessary adjustments to changing conditions. Future surveys of community conditions may result in the expression of new needs and therefore the process will begin anew. The evaluation of alternative plans may also result in the identification of new problems or in the definition of new goals (Hodge 1986, p.175).

These steps, including feedback, are typical of other policy analysis decision models (Friedman, 1987) but the emphasis in this model is the community involvement. The literature on the planning process has developed in stages as new theories build upon previous work, only to be again challenged by new ideas. The theory of rational comprehensive planning (Altshuler 1965), having resulted from the synthesis of the city beautiful and city functional movements early in this century (Banai 1988), dominated the theory of planning until questioned by those supporting disjointed incrementalism or "successive limited comparisons" (Lindblom 1959, p.81). Mixed scanning

sought to incorporate aspects of both comprehensive and incrementalist approaches (Etzioni 1967). These models differ in their approach to the information required for decision making and the time horizon for those decisions.

There are many decision-making models which are explored in great detail in urban planning literature as well as other fields which are involved with advanced decision-making and policy development. Gaming theory (Myerson 1991) and choice theory (Albrecht and Lim 1986) are examples of alternative forms of decision-making which have been recently examined in relation to urban planning. While the ideal planning model has not yet been found, if its attainable at all, there is consensus that taking action in the present and striving for a better future is preferable to waiting for conditions to deteriorate and trying to resolve problems after they have occurred.

3.4. The Mutual Benefits of Planning Theory

While the literature resulting from research on the planning process is often considered simply as planning theory, it is important to note that urban planning is not the sole proprietor of the process of planning. Other disciplines and professions, particularily organizational and business management, also employ the process of decision-making in advance. Therefore

> a major distinction must be made between theories of the planning process—procedural theories—and theories concerning phenomena with which planning is concerned (Hightower 1969, p.326).

Galloway and Mahayni (1977) differentiate between "normative theories of planning and theoretical propositions that pertain to the morphology of the city itself" (p.63), building on the earlier work of Hightower (1969). The distinction is further explained

> as a theory *of* planning as opposed to a theory *in* planning. The former presents the process of planning, including its ideology, values, purposes, and principles. The latter presents descriptive and predictive theories that address the structure and functioning of a city (Galloway and Mahayni 1977, p.63).

This distinction is very important to the understanding of how urban planning theory may benefit other areas of study and practice, particularly disaster management, and how urban planning practice can be improved through incorporating knowledge gleaned from other fields.

3.4.1. The Need for Theories *of* Planning in Disaster Management

Theory *of* planning literature focuses on social decision-making models. It is this area of planning theory which may be of the most benefit to disaster management. To successfully achieve disaster prevention and preparedness it is necessary for disaster management practitioners to articulate goals and to initiate actions in the present which will improve the likelihood of those goals being realized. This is the essence of proactive planning and it requires a decision-making framework beyond the potential needs and resources assessment that is generally promoted in disaster management practice.

The practice of disaster management must progress towards taking an active role in the management of the human-use system's interaction with its

environment or else must be content with perfecting the job of 'mopping up' after a disaster. Proactive efforts aimed at reducing or eliminating hazards, or at increasing the level of readiness and coping capabilities of an at-risk population, ease the task of dealing with the aftermath of a disaster. Therefore it is logical for disaster management practice to endorse an active approach to prevention and preparedness, if only to improve response capabilities.

Disaster management practice must begin to plan actions rather than focusing on the reactive documentation. The contingency planning model is the source of this orientation and therefore disaster management practitioners must look to alternative decsion-making models. This is a lesson that disaster management can take from the urban planning literature that has slowly come to the realization that its practitioners may not utilize one model exclusively and may actually rely on a range of models to meet varying needs. "No set of concepts or ideas has emerged that convinces a majority of practitioners or theorists that *the* theory of planning has been found" (Hemmens 1980, p.259). Disaster management practice must begin to adopt proactive planning models if it is to achieve full success.

3.4.2. Proactive Planning as a Disaster Management Policy

Policies guide and regulate the behavior of individuals or organizations, especially with regard to the decision-making processes.

> Policies make regular what otherwise would be random, chaotic or arbitrary decisionmaking or actions. As premises for decisionmaking, policies provide guidance, direction and a degree of predictability to the behavior of individuals, groups and organizations (Hyman and Miller 1985, p.43).

Policies for disaster management therefore guide the decision-making process of those individuals or organizations involved in preparing for and responding to disasters. When governments employ a decision-making framework it is known as public policy. "Public policy is the broad framework of ideas and values within which decisions are taken and action, or inaction, is pursued by governments in relation to some issue or problem" (Brooks 1989, p.16). The public policy regarding disaster management is important as governments are commonly held responsible for the welfare of the public.

Different social systems respond to specific disasters in varying ways but they do exhibit some common response phases which have been studied and developed in the disaster studies literature (Drabek 1986). Among these response phases is preparedness, which Drabek contrasts against mitigation as being activities "predicated on the assumption that disasters of various forms will occur, but that their negative consequences may be reduced" (p.21), whereas mitigation acts seek to eliminate or reduce the probability of disasters and their effects. Planning for potential disasters is a subheading of the preparedness phase and is referred to as "the basic premise implicit in the concept of 'comprehensive emergency management'" (p.45) at the community system level. In this context planning is considered as an individual component of a larger disaster response program.

Any activity which involves the consideration of future events and initiates actions based on this consideration, either in an attempt to influence those events or to prepare a response to their occurrence, could be viewed as being involved in proactive planning. Therefore this concept of planning takes on added significance as a policy to be adopted within the larger disaster

management framework. Given this significance it is not surprising that disaster studies researchers have built up a body of literature regarding the planning process and its role not only in the preparedness phase but in other response and management phases as well.

Societies may adopt different measures to cope with disasters. In general terms these measures can be considered as either interventionist or fatalist (Britton 1989a). A fatalistic approach to disasters involves regarding the impact and losses as inevitable whereas an interventionist approach involves positive adjustments including modifying the hazard, modifying the human use system, and reducing hazard losses (p.108). The fatalist, 'do-nothing' approach may not always be the result of a lack of understanding or appreciation about the hazards, as one might expect, but in fact may be a rational option for coping. One instance of this cited by Britton (1989a) is the 'Sit-Back-And-Wait" approach which relies on the generosity of government relief. In either case though these fatalist approaches do not involve taking actions towards achieving decided upon goals. Interventionist approaches do undertake such actions and therefore are involved in the process of planning.

The fatalist approach should not be seen to suggest that there will not be a response when a hazard impact occurs or an effort to manage the disaster will not take place. However, as Kreps (1991) points out, "responding to an event is very different from responding to the *possibility* of an event" (p.30). If the *possibility* of an event has not created the response within a community to undertake a policy of planning (or preparedness as Kreps applies the term) improvisation must be relied upon for the management of an actual event. This is not say that improvisation is an inappropriate

response but rather to support the necessity of both preparedness and improvisation in achieving effective disaster management. This reliance is highlighted by Kreps (1991) who states that

> without improvisation, emergency management loses flexibility in the face of changing conditions. Without preparedness [planning], emergency management loses clarity and efficiency in meeting essential disaster-related demands. Equally important, improvisation and preparedness go hand in hand (p.33).

The application of the planning process is clearly a policy decision. The alternative is to do nothing until a disaster occurs then to cope through improvisation. Intervening through a process of goal-oriented decision making, whether those decisions address the hazard, the human use system, and/or the potential for losses, involves implementing a policy of planning. That is to say that the planning process is accepted as a guide for decision-making in disaster management.

Four broad policy options available to public decision makers for addressing the problems of environmental or natural hazards are presented by Rossi, Wright, and Weber-Burdin (1982). The first of these is the free-market approach which asserts that "people have the right to locate in hazardous areas if they want to, so long as they are willing to live with the consequences of that decision" and that "the government is not responsible for protecting [these] people" (pp.4-5). One problem identified with this policy is the public's inability to identify and understand all the hazards which they may face. Another difficulty is the public sympathy arising after a disaster which normally results in financial aid and relief for the stricken

community and thus returns the responsibility and the costs to the government.

The second policy option flows out of this last point regarding aid. In the view of Rossi and his colleagues

> the basic effect of policies emphasizing governmental assistance in the postdisaster period is to lift the burden of environmental risk from the shoulders of the individuals and communities who, through their choices ,have assumed it, and spread that risk over the entire tax-paying population (1982, p.6).

Such policies are seen as counterproductive as they actually encourage the development of hazardous land and perpetuate the belief that the public is not responsible for its own actions because the government will continue to cover any losses incurred, should these actions result in a disaster. This policy option and its pitfalls are also considered by Britton (1989a) in his discussion of the 'Sit-By-And-Wait' tendency. The idea of inaction as a policy decision is supported by Brooks (1989) who stresses that, in some cases, a public policy may be a guiding principle for state inaction (p.18).

The third option to be considered involves the physical containment or control of the hazard itself. These structural mitigation techniques also have negative repercussions. They tend to encourage further development of the hazardous area which is considered safe following the application of a 'technical fix'. The degree to which these areas are in fact protected, as determined by the design standards of the technology, is questionable. A false sense of security is often the result and, in the event of a failure of the control technology, the government is likely to resort again to relief efforts

thereby further entrenching the idea that disasters and the subsequent aid are inevitable.

The final policy option put forward by Rossi deals with non-structural mitigation measures, especially what are broadly termed land-use management practices. These practices are seen to include both city planning principles as well as construction standards. Discouraging development within hazardous areas while assuring that any structures which are built conform to design standards is the basis for this policy option. Problems with justifying the costs and developing the political will to enact these measures beleaguer the option.

However, this last option most clearly showcases the proactive planning process in the role of a hazard mitigation policy choice. This was the intent of reviewing the above policy options as it was important to establish that the concept of proactive planning is a distinct alternative to contingency planning for disaster management. It has also raised a number of the hindrances to adopting and implementing this policy course which will be expanded further below.

3.4.3. Disaster Management as a Theory *in* Planning

Urban planners rely on a broad spectrum of models and theories to assist in their decision-making. These theories *in* planning provide the planner with information about a community and with a framework in which to understand its implications for the future development of the community. Models, such as those which chart neighbourhood change (Knox 1987), are important as they allow the planner to make reasonable and supportable

predictions regarding the general future of a community, or a portion thereof, and this foresight is essential to the process of planning.

Most aspects of community growth are modeled and considered in the planning process. One area that has not been incorporated into planning practice in any standard form is community safety, especially in regards to natural and technological hazards. While road and pedestrian safety has always been an important part of modern physical planning, and crime prevention and personal safety, particularly of women, is a developing issue as it relates to community and site design, there is very little consideration given to hazards in urban planning practice. The history of modern planning is also closely tied to public health and quality of life but this concern is directed at individuals within the population rather than at the community as a whole.

Urban planning practice must begin to factor this different catagory of hazards into its decisions. While disasters may not be as recurrent a problem as traffic congestion, nor as predictable, the potential for large-scale disruptive effects warrant concern. Urban planning has a goal of managing change to achieve a better future for the community. This goal will never be reached if community's future is marred by disaster. Integrating disaster management into the decision-making process therefore improves the process by providing more information and improving the potential for realizing other proposals. Furthermore, urban planners have a responsibility to the safety of the community and should, at the very least, ensure that no action is taken, with the intent of improving the community's prospects, which may actually increase the community's risk of experiencing a disaster.

3.4.4. Common Fiscal Considerations

Disasters are undesirable events even though there is evidence to suggest that the influx of recovery money may be of some benefit (Dacy and Kunreuther 1969; Chang 1983). It has also been suggested that the recovery assistance may even be greater than the actual damage costs (Haas, Kates, and Bowden 1979) and that the long term effects on a community may, on specific occasions, prove inconsequential (Friesema et al. 1979). Despite the opportunities created for the construction industry and the municipal income generated by taxing recovery spending, it is hard to believe that any community would truly be better off following a disaster, especially if the community could access the same resources without having to experience the personal and collective losses.

Common sense suggests that a community should obtain funding for preventative measures which also improve the general condition of the community, perhaps for the clean-up of an abandoned industrial site or for the purchase of floodplains for park space, rather than waiting until a disaster strikes and spending the money to restore the status quo. In this regard urban planning is in a position to direct and support proactive spending. Urban planning can draw on fiscal resources, on the behalf of disaster management, to fund improvements which benefit the community while addressing the hazards. This is an example of where one field's pursuit of the common goal can further the other's efforts.

3.4.5. Land use Management and Social Policy

Land use management and social policy development are two aspects of urban planning practice that are particularly well suited for including hazards

among their concerns. Furthermore, disaster management may act as a catalyst for improving these aspects by emphasizing their connections. While urban planning is often divided into physical and social branches it is important to recognize that they are, in fact, inseparable.

> Physical relations and conditions have no meaning or quality apart from the way they serve their users. But this is forgotten every time a physical condition is described as good or bad without relation to a specified group of users. High density, low density, green belts, mixed uses, cluster developments, centralized or decentralized business centers are per se neither good or bad. They describe physical relations or conditions, but take on value only when seen in terms of their social, economic, psychological, physiological, or aesthetic effects upon different users (Davidoff 1965, p.336).

Davidoff makes it clear that the process of physical planning is more important than its products alone. The connection between the physical use of the land, such as industrial or residential land-use, and the social use of the land, such as low density, upper class housing, cannot be separated nor forgotten.

Urban planning can not be successful if it does not consider the implications of physical planning decisions on the social component of the community. These implications may vary greatly from area to area with differing social and economic factors, especially in cities where distinct neighbourhoods or districts correspond to different social conditions. This is also important when factoring hazards into land-use decisions. Land-uses may pose hazards to other uses and users. Furthermore, the hazards may differ or the risk may increase when different portions of the community's population are exposed.

Therefore the same social and economic factors which create implications for land-use decisions in general may also have an impact on the safety of the community.

3.4.6. Social Policy Concerns in Disaster Management

Vulnerablity reflects a community's ability to prepare for and cope with a disaster. The theories employed in urban planning often reflect the disparity of resources which influences vulnerability. Successful urban planning practice requires that social and economic variables, among others, are considered in the planning process. Therefore urban planning's approach to the diversity of large communities will also benefit disaster management. Successful disaster management recognizes that the social and economic conditions which force portions of the population to live in proximity to hazardous land-uses also influence the ability of that portion of the population to respond to and cope with a disaster.

3.4.7. Land use as a Disaster Management Measure

Urban planning controls the use of land within a community as a method of managing the interaction between the human-use system and the environment as well as managing conflicts within the human-use system. "To use land use policy as a tool of social policy is not optional but inevitable" (de Neufville 1981, p.32). Land use has being recognized as the best link between the social and economic considerations of a community and the natural environment (Arora 1976; Pivo et al. 1990). Land-use management tools, particularily zoning, are the mainstay of physical planning practitioners and are often key factors in the success of social planning efforts.

Disaster management has also made use of land-use management to achieve its goal of limiting the negative effects of disasters. "Proper land use management in hazardous areas can reduce the negative effects [of a disaster] on a social system" (Baker and McPhee 1975, p.7). Disaster management and urban planning can mutually benefit by coordinating the management of land uses in a manner that serves the goals of both. There is already a link between environmental protection and land use (Baram 1976; McAllister 1973) which provides a valuable first step towards achieving this coordination.

Land use management has been applied as a disaster management measure in instances where the geographical boundaries of a hazard can be determined prior to a disaster, such as floodplains (Burby and French 1981; Kaiser et al. 1987), landslide prone slopes (Gordon and Klousner 1986), coastal regions (Godschalk and Cousins 1985), and active seismic areas (Berke et al. 1989). These applications require that risk be discriminated spatially through scientific research for land use to be effective, as demonstrated in studies on landslides (Bernknopf et al 1988; Brown 1991; Gordon and Klousner 1986). As a purposeful adjustment to environmental extremes (Mileti 1980) land use management may range from land use plans and building regulations (Anderson et al. 1990) to the relocation of substantial portions of the community (David and Mayer 1984).

It is critical that there is integration between disaster management and urban planning when considering land use as a means of achieving the fundamental goal of each. The need to integrate environmental protection with development has lead to the development of "a hybird of comprehensive planning called 'special area management planning'" (Healey and Zinn 1985,

p.305) in which urban planning's "ability to identify possible conflicts very early in the [development] process...means it may aid both environment and development simultaneously"(p.306). The potential for mutual benefit exists for urban planning and disaster management as well. A survey of urban planners in the United States showed that the integration of the traditional urban planning concerns of "market forces, infrastructure requirements, and other environmental constraints are all as important as [the hazard] risk in determining the appropriate distribution of land uses" (French and Issacson 1984, p.520). Coordinating decisions so that the goals of both disaster management and urban planning are served is key to the effective use of land use as a management tool (Gibb 1981).

This approach to managing hazards and disasters through land use regulation is not without its faults, however, and should not be considered the sole solution. While modifying human use, in part through regulating land use, is a viable strategy (Britton 1989) it is necessary to consider integrating all hazard modifications to prevent a modification from unintentionally causing harm (Ericksen 1981). The timing involved in applying land use regulations is another drawback of this approach. Areas which are at risk, such as floodplains, must be identified and regulated before the pressure to develop exceeds the pressure to manage the hazard (Driever and Vaughn 1988; Tierney 1989). When an area has already undergone some development it becomes difficult to institute controls on future development while having to overlook the existing uses (Walker and Macgill 1985). Furthermore, development pressures may overcome preexisting land use regulations if the demand for development is great enough, as demonstrated by the ineffective use of zoning to address seismic hazards in California (Palm 1987; Wyner

1984). Urban planning does have experience in implementing policies and is in a better position to enforce policies regarding development (Fleming, Varnes, and Schuster 1979).

Another concern of both urban planning and disaster management is the community's infrastructures. Referred to as lifelines, these are the "systems or networks which provide for the circulation of people, goods, services, and information upon which health, safety, comfort, and economic activity depend"(Platt 1991, p.173). Lifelines include water and sewer systems, public utilities, transportation and communication facilities, and other forms of public infrastructure (Baker and McPhee 1975; Platt 1991). Urban planning is already directly involved with the design and development of all urban infrastructure. Disaster management should seek to insure that these lifelines survive a disaster and thus facilitate recovery. The mutual benefit of planning lifelines, so that they serve the community efficiently and are sufficiently protected, lies not only in being able to continue to use them in the recovery process, but also in avoiding the expense of upgrading or replacing them after a disaster.

3.5. Two Approaches to Uncertainty in the Planning Process

3.5.1. Introduction

Urban planning and disaster management share common ends and means. They also share the one factor, uncertainty, which is common to all organizations that attempt to plan for the future. Regardless of the decision-making process utilized, once actions are decided upon they must then be successfully implemented. Urban planning and disaster management

employ two different approaches to coping with uncertainty. Both approaches have their own benefits. Combining the two will capitalize on their advantages providing a better method of dealing with uncertainty.

3.5.2. Uncertainty in the Implementation of Proactive Planning

Having established that a policy of adopting a proactive planning process is a distinct and viable option to disaster managers, the subsequent concern of following through on the policy in practice requires investigation. There are many factors which either hinder or aid in the implementation of public policy in general. Policy implementation is the carrying out or application of the policy, in contrast to the original creation or formulation of the policy by the appropriate authority. This distinction, though challenged in policy literature, remains important when considering policies at an elementary level (Mazmanian and Sabatier 1983).

The primary problem to be addressed in respect to implementing a policy of planning is the uncertainty involved. The urban planning profession has been dealing with the hurdle of uncertainty for decades (Lindblom 1959: Christensen 1985) and this interest has more recently crossed into disaster management (Kartez 1984: Kartez and Lindell 1987). The concept of uncertainty has also been incorporated into a taxonomy of ignorance by Smithson (1990) which is an important step as ignorance has been cited when discussing the lack of appropriate planning in disaster management (Lowrance 1983: Kreps 1991). To begin to understand how uncertainty hinders the implementation of the policy of planning it is necessary to become familiar with its role within the general planning process.

Uncertainty is inherent in the planning process even though the very nature of planning is associated with the rational development and initiation of actions with the intent of influencing future events and thus achieving desired goals (Self, 1981). This simple interpretation of the planning process echoes that of Wildavsky who suggests that "planning requires: (1) A specification of future objectives and (2) a series of related actions over time designed to achieve them" (1973, p.131). These definitional statements, as general as they are, both recognize the involvement of some degree of prediction or extrapolation of trends and outcomes.

However, as Wildavsky points out, "the present may be reluctant to give birth to the future" (p.128). This remains as true today as it did two decades ago and is echoed in current planning literature.

> Life in general, and planning in particular, are clearly more problematic in this period of rapid change, increasing turbulence, and considerable uncertainty. ... In the absence of a clearly defined and predictable future, planners must be prepared for a range of possible futures (Seasons 1991, p.31).

Not all uncertainty, however, is rooted to the unpredictability of the future. Uncertainty may also arise from unclear goals and methods. These last two are the sources of uncertainty which deserve a more detailed review.

Planning processes, which are in turn derived from different planning theories, need to be applied to differing circumstances in order to correctly address the uncertainties associated with those particular circumstances (Christensen 1985).

> A crucial planning task is to discover, assess, and address uncertainty. Traditionally, planning has

> assumed that both means and ends are known. This professional legacy biases planners toward planning processes that address such conditions of certainty and disguise actual conditions of uncertainty. Thus planners may easily misconstrue their problems and use inappropriate processes, which lead to ineffective or harmful results (p.63).

With this task in mind Christensen develops a four cell matrix of planning problems with goals (agreed/not-agreed) and technologies (known/unknown) as the dimensions (Figure 3.1). In this context the technologies refer to planning approaches or means through which the goals or ends are achieved. From a discussion of the four resulting combinations of uncertainty (known technology, agreed goal; unknown technology, agreed goal; known technology, no agreed goal; and unknown technology, no agreed goal) she builds support for prototypical contingent planning processes to address the four distinct types of planning problems and poses "public expectations of government's performance appropriate for each"(p.66). To summarize the implications of this, in her words,

> planning processes can be understood as addressing different conditions of uncertainty. Thus planners must assess the actual conditions of uncertainty that characterize the particular problem they are confronting and then select a style of planning that suits those conditions. By tailoring planning to real-world conditions, the planner is acting contingently. In doing so the planner copes rationally with uncertainty (p.69).

Christensen's reference to rationality does not infer that a planner can revert to the rational planning paradigm which has dominated planning theory since the 1950's (Lindblom 1959; Alexander 1984; Friedmann 1987) to cope

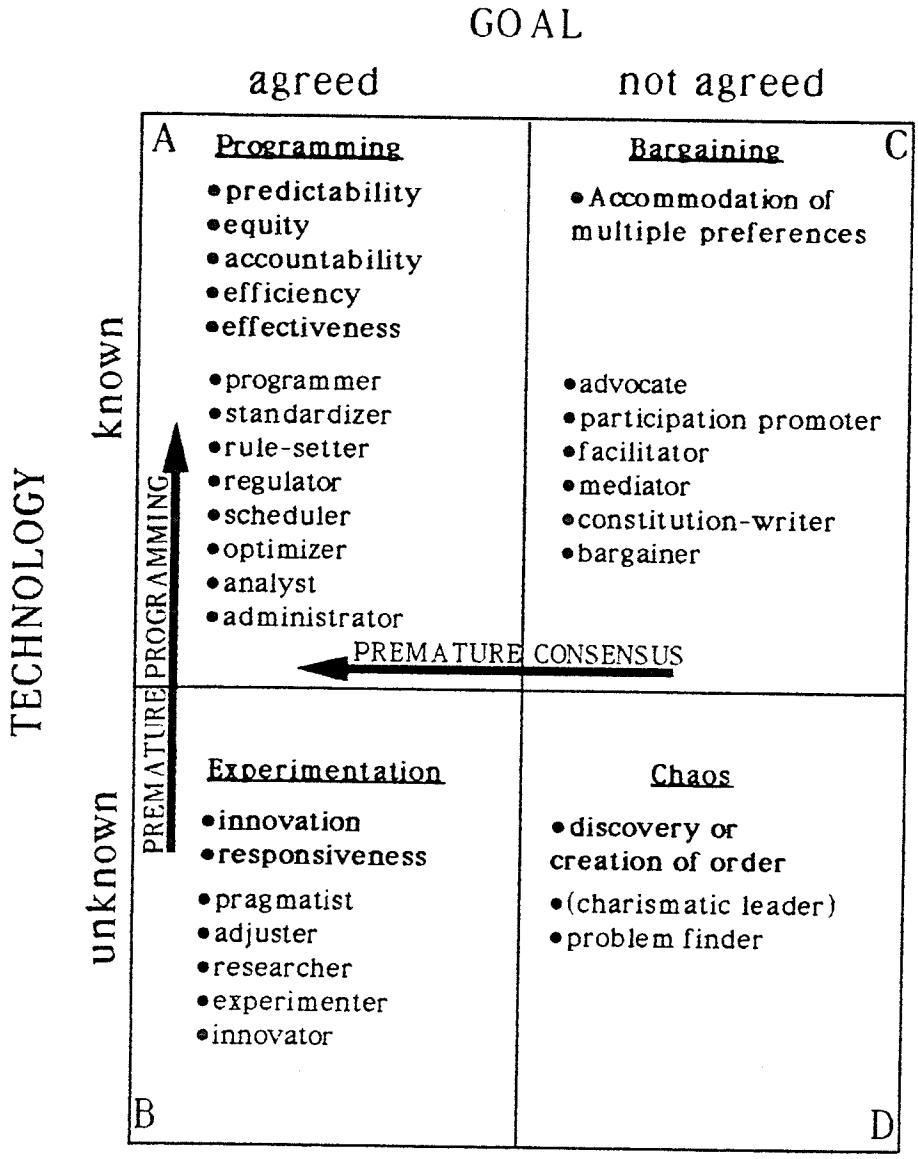

FIGURE 3.1

Prototype Planning Problem Matrix

Incorporating: Prototype Response Processes
- **public expectations of government**
- planning roles (for contingent planning)

POLICY CONSTRAINTS

Based on Christensen (1985, Figures 1-3)

with uncertainty. Nor does contingency planning rule out the appropriateness of improvisation (Kreps 1991) in some circumstances.

The implications for the implementation of planning are also focused on by Christensen. She discusses two policy constraints which are of particular interest in the disaster management context. The first of these is premature programming which occurs when,

> from a narrow set of alternatives, a particular proposed but unproven technology is selected, and then implemented through prescribed procedures and organizational mandates, as if the technology were already proven effective (p.69).

This constraint is contrasted with premature consensus. This second constraint operates along the goal dimension of Christensen's matrix and occurs when a goal, rather than a technology, is adopted as acceptable without appropriate consideration.

The importance of these two constraints to disaster management is clear. The first, premature programming, is at work when technological fixes or means are implemented without proper consideration being given to their potential impacts or ends, such as when flood prevention works encourage building on floodplains. Premature consensus may occur when the concerns of one vocal special interest group result in policy decisions which impact on other at risk groups which may not have the resources to present its concerns or to cope with a disaster.

Uncertainty lies at the root of many of the problems which face a community which is preparing for a disaster. The major concerns in achieving some

degree of preparedness center on experience and planning. Uncertainty is also a concern within the planning process itself.

> Critics blame failures to adopt strategies that anticipate the likely demands of a community disaster on a lack of experience, lack of planning, poor planning, and individuals' inability to learn from experience. To counter such criticisms, the local government approach to disaster management needs to be based on a conceptual framework that relates those factors to each other and to the objective of planning effectively for uncertain events (Kartez and Lindell, 1987, p.489).

The objective stated above, "planning for uncertain events", emphasizes the importance which uncertainty plays in effective disaster preparedness and management. Kartez and Lindell point out that "experience with uncertain events like disasters can be subject to highly variable interpretations [and] therefore an organization must process that experience through good planning to develop wise coping preparations"(p.490). Here the link between uncertainty and planning as a policy option is evident. A community or organization must recognize the uncertainties involved in its planning process and redress them appropriately.

This last statement is especially true for emergency organizations which must cope with situations of extreme uncertainty. Britton (1989b) observes that during

> extreme social crisis episodes, organizational decisional uncertainty is also at its most extreme, and the propensity for decisional stress is at its highest. It is not unusual, under these circumstances, for the decision-making capability of some organizations to alter substantially and, in some instances to decline. This is especially likely

> when the crisis episode relates to actual or threatened disaster impact (p.12).

When the context is stressed by the threat of disaster it is important to recognize that methods of decision-making which are suitable under normal circumstances become unmanageable. Neither the traditional comprehensive planning approach nor "muddling through" (Lindblom. 1959) may meet the decisional needs of the situation. An alternative to these which may be considered is contingency planning.

The contingent planning process, which was developed by Bryson (1983) and tested in a laboratory setting, was utilized by Kartez and Lindell (1987) to develop a model of local disaster planning. The findings of the original laboratory tests showed that "planners do behave contingently if given the choice" (Bryson 1983, p.254) however this choice was shown to be motivated primarily by political contingencies. Uncertainty as a contingency "can evoke a reflexive dependence on familiar strategies" (Kartez and Lindell 1987, p.496) which is an unsatisfactory response for governments faced with the unfamiliar and uncertain circumstances of a disaster. Uncertainty is present in both the problems which the planning process is employed to resolve and in the difficulties faced during the application of the process itself. Uncertainty within the planning process is not always recognized as a negative (Sherman and Livey 1992), so long as its presence is acknowledged. This acknowledgment is forthcoming in many areas of urban planning, especially when the environment is also involved (Szechenyi 1992).

3.5.3. Uncertainty in the Ignorance Taxonomy

Christensen (1985) pointed out that planners must recognize where uncertainty exists if they are to plan effectively. In order to successfully recognize how uncertainty is influencing the planning process it is important to develop an understanding of how it fits into the broader topic of ignorance. The taxonomy of ignorance, as explained by Smithson (1990), considers ignorance to be more than a lack of knowledge. Ignorance, in this context, is seen as a "social creation,... socially constructed and negotiated"(p.209), which incorporates uncertainty as a third level distinction.

Uncertainty, in this framework, is a type of incompleteness of information which is one component of an erroneous cognitive state. Uncertainty involves incompleteness in the degree of information, as compared to absence of any information. Since uncertainty therefore entails the presence of information which is to some degree incomplete, Smithson(1990) distinguishes three origins of uncertainty: ambiguity, probability, and vagueness.

As the first of these sources of uncertainty, ambiguity "entails multiple possible interpretations of a piece of information"(Smithson 1990, p.221). It is worth noting that Kartez and Lindell (1987) recognized that different interpretations of the same experience may adversely affect the planning process. The problems of precision in determining the probability of events creates Smithson's second source of uncertainty. Again disaster management research has expended considerable effort on investigating how probabilities are best incorporated into the planning process and how such

information should be presented to the public. The third source of uncertainty, vagueness, is divided into fuzziness of and/or nonspecificity of data. Smithson lists eight conditions under which data collection is questionable. All eight reflect a disaster-like situation though Smithson warns that even data collected under normal circumstances may be questionable.

3.5.4. Uncertainty as a Connection

Disasters, by their very nature, place a strain on the abilities of communities to cope. Faced with the prospect of a disaster a community must decide how and to what degree it will prepare for a disaster, assuming that the decision may be made at the community level and is not mandated to a higher level of government.. The community may decide to rely on its own adaptive capabilities and improvise a response when needed. It may place its trust in some higher authority, assuming that other levels of government will be prepared to respond and to provide relief. The community may decide that it must take on the responsibility of preparing itself and turn to a process of determining its goals, developing strategies to achieve these goals and taking actions to carry through these strategies. If this last course is chosen the community has adopted a framework for its decision-making, in fact it is attempting to implement a policy of planning.

Having made the decision to adopt the policy of planning for a disaster, society must face a number of factors which will influence its success in following through on its policy. A critical factor is the complex issue of the uncertainty involved in both the planning process and in disasters. Uncertainty, as it relates to ignorance, is concerned with the completeness of the information used in the decision-making process. In planning,

uncertainty can result in inappropriate decisions which may undermine the effectiveness of the process. For disaster management, especially in the area of community preparedness, this uncertainty extends to the ability of those involved to perceive and incorporate experiences into their planning efforts.

Two planning processes are employed by urban planning and disaster planning. Both fields rely on common research into organizational and social theory for an understanding of how the planning process operates in practice The importance of this is recognized by Kartez (1984) when he closes by stating that "we should remember that much of this seminal work in planning process theory originally was directed at the problems of organizing for uncertainty, risk, and crisis"(P.20). Similar sentiments regarding the importance of city planning theory are present in disaster management literature (Quarantelli 1988). However, each field focuses on a distinctly different approach to the shared problem of uncertainty. Urban planning utilizes the flexibility of a proactive approach while disaster management employs the contingency planning approach. Disaster management has had some limited success with contingecy planning by limiting the range of scenarios and developing event generic responses. If a proactive planning approach was used instead, disaster management may be able to eliminate the hazard scenarios for which a prevention alternative exists and thereby better focus its response efforts. Thus uncertainty may provide a critical link between these two fields and lead both to a better understanding of each other and themselves.

3.6. Summary

Disaster management and urban planning share many common means and methods. They both attempt to guide communities toward a better future, albeit by focusing on different attributes of the problem: urban planning practice promotes positive actions in the present to influence the future; whereas disaster management practice focuses on preventative or reactive actions to undesired events. They each recognize the need to address or modify both the human-use system and the environment in order to achieve their goals and employ land use regulation and social policies as means to this end.

The practice of both fields is faced with the constant challenge of overcoming uncertainty. Together they stand a better chance of meeting this challenge successfully. The sum of the combined experience of the two practices, with support from the theoretical literature, provides a strong base on which to deal with uncertainty.

Coordinating and integrating the efforts of disaster management and urban planning is essential to realizing their common goal. Burby et al. proposed that

> information and policy about natural hazards, their associated risks, and strategies to control those risks be included in comprehensive planning, and that in turn comprehensive plans serve as a mechanism through whic risk management poicy is determined, communicated, and effectuated (1991, p.79)

If the actions of urban planning and disaster management are not coordinated the chance increases that there will be conflict, detrimental to either or both,

and that their goal will not be reached. These consequences of a negative interaction must be avoided.. Disaster management and urban planning are closely linked through both means and ends, and yet are separated in theory and practice. Bringing the two closer together, thus strengthening the positive aspects of mutualism, should be the immediate aim of both professions.

CHAPTER FOUR:
A Shared Philosophy

4.1. Introduction

Urban planning and disaster management share the common goal of a safer future. They share some common means to achieving this end and will both benefit from further interaction. They also share a common philosophical outlook which their respective theory literature attempts to explain and their practitioners must deal with. This chapter examines this outlook by focusing on: the ethical justification for intervention; the role of public participation; and the importance of sustainability and environmental protection. All three of these distinct areas present opportunities for both fields to benefit from the other's successes and to learn from the other's experience. This will further strengthen the interface between urban planning and disaster management. Chapter Four reveals these opportunities and thus presents future research directions.

4.2. Ethics and the Justification of Intervention

4.2.1. The Ethics of Urban Planning and Disaster Management

Disaster management and urban planning both strive to make decisions which are best for the community they serve. This raises questions about the ability to determine what is best, the definition of community, and the right to make such decisions. The answers to these questions lie in the ethics

adopted by each field. Ethics, in this context, "provides principles and criteria by which we evaluate human behavior from a moral point of view" (Harper and Stein 1983, p.40). The practice of disaster management and urban planning are both justified through "these basic (moral) principles [which] can be applied to evaluate all government interventions" (Harper and Stein 1983, p.40).

Professional ethics can refer to either the value of the profession to society or to the practice of profession, which assumes its social value (Marcuse 1976).

> Occupational ethics begin by accepting the social utility of the occupation, and ask how that utility can best be enhanced. The assumption that a reputable planning profession is itself a matter of social value is unquestionable. But perhaps it is precisely in the values the occupation serves that the ethical difficulty lies (Marcuse 1976, p.271).

Given that such ethical difficulties may arise in both theory and practice, codes of ethics and of conduct have been established by the professional associations, such as the Canadian Institute of Planners (Hendler 1990). Urban planning, as a profession, has dealt with internal ethics covering the conduct of its practitioners through these means. However,

> professional ethics could logically go beyond their present narrow attention to client-serving, guild-related roles of planners to examine their real effect on the social, economic, and political system in which the planner's activities take place (Marcuse 1976, p.272).

The ability of urban planning decisions to affect the social system is the underlying strength of the profession. It may also become an ongoing concern, if this influence is not managed in an ethical manner. Different

moral principles may be used to approach this concern, each with its own benefits and drawbacks (Beatley 1984). Expanding the profession's moral commitment to the community and recognizing the potential effects of planning decisions within an ethical framework will hopefully be a step forward for the profession.

Marcuse argues, however, that "professional ethics are likely simply to render more efficient the services provided by planners to those presently with the power to use them" (1976, p.273). If this is so, those members of the community which do not have the power to make use of urban planning stand to suffer the consequences, intentional or not, of planning decisions initiated by others. Furthermore, those who are least able to influence planning decisions are also least likely to be able to cope with the consequences. Beatley (1989a) recognizes that environmental harm, such as pollution, "has particularly unjust implications for those lower-income social groups, because they are the least equipped to respond to such harms" (p.12) and therefore they suffer disproportionately.

To redress this injustice it is necessary to intervene in the decision-making process in a manner that considers those who are unable to promote their views and positions independently. Such intervention in the social system must be justified before it can be accepted by the community. The validation of intervention depends largely on an understanding of both public problems and the public good. Harper and Stein (1983) define the former by explaining that

> problems refer to individuals failing to meet their own goals. Social problems are those problems which some group regards as undesirable. Public

> problems are social problems in which government intervention is justified (p.45).

It is insufficient, if not tautological, to state that government intervention is justified in public problems which are themselves defined by that intervention. The second concept, that of the public interest, must also figure in the justification of intervention.

4.2.2. The Issue of the Public Interest

The public interest refers to the concept of what is best for society and is often called the public or common good. It has been argued that "responsibility to successors is one of the primary obligations of the city planning profession. Every plan presupposes a sense of obligation to the future and those who will live in it" (Bolan 1983, p.25), though this view does not go unchallenged (Beatley 1989a). Klosterman (1980) notes that

> planners' concern with the public interest reflects the concept's importance in political theory and other areas of policy making ...[but] many reject the concept as a vacuous phrase used only to promote the special interests of some over the equally valid interests of others...[while] others reject the pursuit of a unitary public interest as politically naive because it ignores the distributive effects of public policy (p.323).

This reaffirms that consideration of future generations is not the only component of the public interest. The concept is complex and still under debate.

Action in the public interest may be seen as either action in the interests of all individuals or as action in which "the interests of those individuals who benefit from the actions advocated should take precedence over the interests

of those individuals who bear the cost of the action" (Harper and Stein 1983, p.43). In this sense the public interest begins to recognize the socially disadvantaged as deserving action which may come at the cost of others. It is important to temper this view of the public good however. Harper and Stein (1983) also point out that

> the utilitarian's 'greater good' makes sense only if it is reduced to individuals achieving their own goals. The goal of enhancing happiness or reducing suffering thus must be constrained by respect for individual rights (p.42).

To support this statement the authors use the example of siting a hazardous nuclear plant near a residential area that is for the greater good of the community but endangers those nearby, thus violating their rights as individuals. Beatley (1989b) points out that "disaster management can be justified and defended on utilitarian ethics" (p.8) though he goes on to warn that "an untempered utilitarianism ...may lead to many results which strike us as simply unjust or unethical" (p.10).

The concept of the public interest thus becomes a balancing act between the rights of the individual and those of the population at large. Given the difficulty in finding this balance, it is not surprising that the decisions of urban planners "may concurrently produce some good *and* some harm" (Bolan 1983, p.27). Bolan cites the hypothetical task of siting a hazardous chemical plant in a community, with the promise of increased in employment and tax revenue but the hazard of toxic wastes, as an example of when an urban planner may be faced with a difficult ethical choice. He goes on to recognize that "in the past twenty-five years, planners have become increasingly aware of these conflicting results of their practice"

(p.27) and that this may be the most common decision-making context facing urban planners.

The importance of this conflict to disaster management is made evident in the examples chosen by Bolan (1983) and Harper and Stein (1983). Urban planning decisions are often justified by either the good that will result or by the technical validity of the decision process (Hoch 1984). Disaster management decisions focus on the prevention of harm while also relying on technical expertise to justify certain interventions. In theory it would appear that good urban planning decisions, supported by valid methods, would reflect disaster management's concerns. In practice this is not always the case.

Marcuse (1976) argues that planners "may have a more systematic approach to the 'public interest' than the average citizen, but this gives them no right actually to make decisions in public matters, nor any concomitant public responsibility" (p.270) and yet both urban planning and disaster management, in practice, make such decisions and carry the associated responsibility. The difference between practice and theory is also discussed by Bolan (1983) who writes that

> professionally, [urban planners] espouse to act beneficially for macro-level moral communities: the city, the region, the state. But such actions are always taken within the prescribed norms of micro-level moral communities: the planning department, the mayor's office, the city council. We [referring to urban planners] ideally aspire to have our professional practice contribute to broad-scale social improvement, but, on a practical level, we learn the behaviors that will help us to defend, survive and have effect on our immediate organizational setting. We learn the difference

> between an ideal ethic and a practical ethic quickly (Bolan 1983, p.31).

This contention that urban planners may consider personal matters when facing ethically difficult decisions must be remembered when evaluating such decisions from the disaster management viewpoint. The immediate benefits of allowing a controversial development, be they the aesthetics of a residential area in a scenic floodplain or the potential tax revenues from a hazardous industry, may override the safety concerns if these concerns are not embedded in the ethics of the decision makers. This argument also applies to the private sector (Jackson and Janssen 1990).

Despite the best intentions of any practitioner who is required to act on behalf of the public interest, there remains the questions of perception and interpretation. While it is not practical to determine the opinion of the entire population on every issue, it is important for both urban planning and disaster management that the direction and intensity of the current trends in the public interest are monitored and adopted into the planning process. This can be accomplished through an ongoing process of public education, consultation and participation that allows the public to determine its own best interests.

4.3. Community Participation in the Planning and Management Process

4.3.1. Introduction to Community Participation

The need to involve the public in the decision making process is critical to both urban planning and disaster management. Public participation and collaboration in the decision making process is the most legitimate source of community goals, from which an understanding of the public interest can be

derived (Altshuler 1965). It is also an "alternative to the conventional means of dealing with public acceptance problems" (Ducsik 1981, p.165) that may arise during the process, especially if the project is hazardous or otherwise unwanted. Public participation has a history of success in Canada though there is still resistance because "public participation amounts to citizens being able to *share the power* over planning decisions" (Hodge 1986, p.351). Despite this resistance, public participation is increasingly important in the decision making process.

4.3.2. Public Education and Community Empowerment

The public's role in managing the urban environment has been limited. Both urban planning and disaster management will benefit when the public begins to take a positive interest in their efforts. This understanding must be fostered through education and must lead to active participation in the planning process.

> To be helpful, the educational effort should make clear the limitations or choices imposed in planning by available resources, the time and cost of effectuating planning policies and programs, and the necessary involvement of most aspects of urban life (Branch 1974, p.152)

Furthermore, educating the public is most useful when the knowledge can be channeled back into positive action toward the goals of urban planning and disaster management. Unfortunately, the current role of such public empowerment is negative and creates adversity that must be overcome in the planning process. "Quality of life through empowerment of the individual requires responsible, participatory citizenship" (Weiler 1991, p.35). Such citizenship must be nurtured and welcomed in the planning process.

4.3.3. The NIMBY Phenomenon

This is the negative side to public participation which usually appears when a community or neighbourhood opposes the siting of a facility or service, or resists the implementation of specific measures or regulations, often without reasonable grounds. Urban planners have adopted the term NIMBY (Not-In-My-BackYard) which "refers to the protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood" (Dear 1991, p.288). Urban planners have had to develop strategies to overcome NIMBY sentiments in order to find locations for necessary facilities such as waste disposal sites.

This is one area of concern in which disaster management may currently contribute to the opposition rather than the solution. Public safety is a common argument against siting hazardous facilities and may represent a valid problem in some instances. It is therefore necessary for the decision process to include professional input from both disaster management and urban planning to assist in finding a suitable location and achieving community acceptance. Disaster management proposals involving measures or regulations meant to eliminate hazards or to decrease vulnerability may also meet with NIMBY opposition.

Using the case of siting hazardous or unwanted land-uses as a departure point, it is possible to argue that urban planners should incorporate disaster management in their decision process and that disaster management professionals should recognize the role urban planning plays in their efforts. The two fields influence each others decisions directly and frequently, yet there is no formal coordination. If coordination is not pursued urban

planning decisions may continue to inadvertently increase the risk of some groups (Britton and Lindsay, forthcoming) and disaster management may unnecessarily hinder necessary development. This coordination may take the form of a safety committee. The concept of the safety committee has support in the disaster management literature (Foster 1980; Laughy 1990) though it is not recognized as a method of integrating urban planning and disaster management. Chapter Five further explores this possibility.

4.4. Sustainability and Environmental Protection

Urban planning has had a concern for the environment since the founding movements of Geddes at the end of the last century, though this concern has been periodically overshadowed by other interests (Gerecke and Reid 1991). In the mid-1970's the environment was an issue that instigated a response from both public and private agencies (Kaiser et al. 1974; Healy and Zinn 1985). Today the concern is regaining its importance in the "public conscience" (Metcalfe 1991, p.60) and has fostered a "growing political response" (Szechenyi 1992, p.17). Traditional urban planning concerns, such as transportation (Bisson and Wilson 1991; McEachern 1991), are now being considered with respect to their environmental impacts, though these are often limited to pollution (Millar 1990). The recognition that "planners can help to reverse the trend of a decaying ecosystem, and can be at the leading edge of bringing 'sustainable development' to our communities" (Nawaz 1991. p.58) is spreading throughout the field with renewed vigor. The current connections between urban planning and environmental assessment are examined by Lawrence in an article (1992) which parallels the ideas of this thesis. Lawrence concludes that the integration of planning and environmental assessment holds a great potential for mutual benefits.

The concept of sustainable development was popularized in 1987 report of the World Commission on Environment and Development. The report states that

> humanity has the ability to make development sustainable — to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs (Bruntland 1987, p.8)

The report later recognizes that the development and introduction of new technologies, especially into nations that are unfamiliar with the level of technology, must be done with respect to the management of risk. This is equally important in more developed countries, where the economic pressure to capitalize on all possible resources may force a community to choose between development and the safety of itself and its environment. Richardson (1989) defines sustainable urban development as

> a process of change in the built environment which fosters economic development while conserving resources and promoting the health of the individual, the community and the ecosystem (p.14)

This lends further support to the common fundemental goal of working toward a better future while protecting the community and takes it a step further by including the ecosystem.

Urban planning and disaster management are linked by the ethic of making decisions in the best interest of the public. There is also this mutual concern with the environment. "Virtually all facets of [urban] planning, whether economic development, growth management, housing, or transportation, have direct impacts on the natural environment" (Beatley 1989a, p.2) and the

natural environment is a major factor in disaster management. Furthermore environmental ethics asks "questions of moral relationships and obligations between *humans* ... because they involve the use or misuse of natural environments and natural systems"(Beatley 1989a, p.3). These are the same questions asked in both the urban planning and disaster management literature on ethics.

> Integration of environmental protection into urban planning has made much progress, but the need for research into the social, political, and economic bases for applying technologies and consolidating decisions on divergent aspects of problems is very apparent (NASULGC 1990, p.33).

Similarily, disaster management must begin to address the same social, political and economic issues in relation to protecting the environment as it does in protecting the community. The common moral and ethical responsibility of the two professions, to both the public and the environment, is one of the strongest ties between the two.

4.5. Summary

Disaster management and urban planning share many commonalties. The ethical justification for intervention is based on the public interest for both. The literature justifying urban planning intervention often uses disaster management scenarios as examples. Disaster management can find support in the legal basis of zoning and land-use management to legitimate its intervention. The two fields promote each other in this sense and strengthening the connection further supports their individual positions.

An understanding of the public interest is essential to the success of both fields. A critical step towards this understanding is the participation of the public in the decision making process, especially at the goal development stage. The public has a tendency to become involved only when it perceives a threat, as demonstrated by the NIMBY phenomenon. Urban planning has had to deal with public opposition in the past and is now recognizing the benefits of capitalizing on public participation as a means of avoiding these difficulties. Disaster management must also respect the public interest and will benefit from adopting an open approach to public participation. Since the topics which disaster management deals with are likely to attract to public, urban planning will benefit by using disaster management as a forum. Personal safety is one example of how urban planning is using a concern to encourage public participation while addressing an important issue. Again a united approach will benefit both urban planning and disaster management.

CHAPTER FIVE:
Conclusion

5.1. Introduction

This thesis has presented commonalties between urban planning and disaster management. These commonalties in goals, means, and issues have been drawn from both the theory and practice of the two fields. It has also identified areas of overlap that are mutually reinforcing. What is need, however, is a forum to harness the benefits of these connections.

Every community is a unique combination of natural features and human activities in a constant flux of interaction. Different methods of managing this interaction have been developed, each reflecting different political, social, and economic conditions. It is unreasonable to assume that one method of connecting urban planning and disaster management will succeed in every community. It is more important for the method to be responsive to the system in which it will operate than for it to be standardized. The experiences of other communities may prove helpful but a community cannot adopt another community's program without tailoring it to their specific needs. Urban planning practitioners have learned that one community's solution may not solve a similar problem in another community because of this diversity.

The task of integrating and coordinating urban planning and disaster management must be undertaken by each community in a manner which will

complement the existing management and planning framework. Therefore this final chapter does not attempt to impose any one method of achieving increased connection. It does, however, examine the concept of the safety committee as a possible step towards successful integration and outlines how such a committee may be developed. This discussion is intended to present one alternative approach to bringing the two fields together in practice and therefore should not be interpreted as providing the final solution.

5.2. The Safety Committee as a Forum for Coordination

There must be integration and coordination if disaster management and urban planning are to achieve their mutual goal of a better future. Both fields must develop ways of including the other in their own internal decision making process and, by doing so, improve these processes. It is necessary to consider the least desirable outcomes throughout the process of identifying possible future outcomes and taking actions which will lead to the most preferred alternative. This is the essence of the planning process.

Improving the practice of disaster management provides an important step toward a better future by reducing or even eliminating many of the undesired alternatives from the urban planning process. This allows urban planning to focus on actions which will enhance development towards the preferred alternatives. Urban planning also plays a role in improving the practice of disaster management. This requires the recognition and incorporation of disaster management concerns in urban planning decisions. Thus the benefits are mutually supportive. Better urban planning improves disaster

management which, in turn, leads to better urban planning. Once this cycle is put in motion it will continue to benefit both fields.

There are three essential factors for a community to be properly prepared to manage disaster: First, safety become a consideration in all public decisions, especially in urban planning decisions which have the potential to either improve or reduce safety. Secondly, the effort must be an ongoing process which is not focused solely on an end product, such as an emergency plan, but rather on continually improving the safety of the community. Finally, the public must be directly involved throughout the process. The practice of disaster management will be improved if these three factors are addressed and, as stated above, this will lead to a corresponding improvement in urban planning.

Drabek (1986) recognizes three weaknesses in disaster planning: 1) the lack of coordination between disaster planning and the day-to-day urban planning process; 2) an overemphasis on the product rather than the process of planning and; 3) a lack of consideration for human aspects and concerns in the decision making process (p.53). These weaknesses are symptomatic of the failings of disaster management efforts which do not utilize a community based process and reflect the lack of integration with urban planning.

If a community is to be prepared for disasters it must have a framework in which to develop and then administer a disaster management process. This must be centered on coordination with the urban planning decision making process. The idea of integrating disaster management and urban planning is critical (Kartez and Lindell, 1987; Foster, 1980). The establishment of a safety committee has been suggested in the past (Foster 1980, Laughy 1990)

but these have failed to facilitate the integration of the community planning process and the disaster management process.

To succeed in coordinating and integrating disaster management and urban planning decisions a safety committee must be in an organizational position to influence the decisions of both processes. Such a position would create a link between these two decision making authorities and increase communication leading to the more effective and comprehensive resolution of the issues. The exact role of the safety committee in the local government will depend on nature of the government's structure.

The safety committee will need to review and comment on both urban planning and disaster management proposals in their earliest stages. This will guarantee that conflicts are resolved and that actions, and thus expenses, are coordinated and efficient. The committee will influence the decisions of both processes, direct joint ventures, and ensure that community safety remains the first priority in all decision making. Developing the operational framework of such a safety committee will be the responsibility of the local government. The committee must have the ongoing support of the government and the public to enable it to successfully meet the challenge of integrating urban planning and disaster management.

5.2.1. Composition of the Safety Committee

Foster (1980) envisioned a safety committee which incorporated a "wide variety of expertise" and provided a holistic approach to the task of developing comprehensive plans which he felt must "include safety as one of their main goals" (p.4). Foster's proposed committee focuses on the technical expertise of individuals to assist in hazard identification at the cost

of including members with planning skills. The important concept of establishing a safety committee is not, however, diminished.

A safety committee must be representative of its community and knowledgeable of the disaster issues. It must also have a built in system of maintaining that representation and knowledge. The community must be kept informed of the committee's actions and their reasons to ensure that decisions address public concerns. The community must also have avenues of participation in the decision making process and in the implementation of those decisions. Should circumstances force the safety committee to make decisions without fully consulting the public, the community must retain a right to ratify such decisions. While this focus on community involvement may appear to create unnecessary hurdles for the safety committee it is essential if the committee's work is to be successful.

To reflect the community involvement the safety committee will be comprised of members from the different interest groups in the community. This diversity is important when the varying views and perceptions of risks are considered (Green et al, 1991). The narrower view of a safety committee's composition is a drawback to other versions which omit many key participants. One of the most important tasks of the safety committee is to maintain awareness of safety issues and diversity allows this awareness to be disseminated.

The safety committee's roster will include elected officials to represent the governing body. It will also need to have urban planners, emergency services personnel, and other public servants representing their respective services and providing technical skills and support. Private sector

representatives will attend to promote business and industry interests while soliciting feedback on how they can further the committee's goals. The media's presence will assist in maintaining community attention and awareness while fostering a rapport between the safety committee and the media. The safety committee will be ultimately responsible to the community at large and therefore community involvement is very important to the success of the committee.

This is not intended as a definitive list of members. Each community will tailor its safety committee to best meet its needs and to successfully compliment the disaster management and urban planning processes. It is important that the safety committee is comprised of identifiable positions and does not have its functions or attentions centered on an individual personality. This insures a continuation of the process and will not link the process to one term of office or any other temporal limit. It is essential that the process is understood by the community to be ongoing and the responsibility belongs to the community itself.

The safety committee may decide to develop sub-committees consisting of general members and invited experts to address specific issues. Sub-committees will be a way for the community to access the scientific and technical knowledge needed to properly develop and evaluate preparedness measures (Britton, 1987). All findings and recommendations of these sub-committees, or any other peripheral discussion groups, will be presented and discussed by the safety committee to insure a holistic approach. It is important for the public to recognize the safety committee as the central source of information and decisions.

Groups which present unique difficulties to the disaster management process such as children, the elderly, and the physically and mentally challenged (Snyder, 1991; Parr, 1987; Lafond, 1985) require specific attention. These groups must be assessed as a distinct segment of the community as they may be more susceptible to some environmental agents and may not utilize the same coping strategies as the rest of the community. The problems presented by these groups must be addressed with care and the ongoing involvement of the groups in the planning process is very important. The safety committee must be aware of how specific at-risk groups fit into the community and plan appropriately for their special needs while maintaining a perspective of the wider community.

5.2.2. Public Participation in the Safety Committee

The most important component of the safety committee is the general public. This cannot be over stressed. The public must be encouraged to participate at all stages of the process. This is in response to the errors of

> current counter disaster management measures [that] have deliberately prevented the general public from becoming active participants in all but one part of the disaster impact process. The public's role [has been] officially viewed to be reacting to instructions (Britton, 1987, p.153).

These comments, written in response to the Australian situation, could be applied to most disaster management efforts. The safety committee must include members of the public and continually seek out community input for it to successfully administer the disaster management process.

Interested members of the public will be encouraged to become involved with the safety committee and will always be welcome. It is essential that

the residents are a part of the process for the community to achieve preparedness. Britton (1987) further recognizes

> that successful disaster planning requires total community involvement. ... Public involvement creates significant opportunities for awareness creation, and generates interest to maintain involvement (p.157).

Public input will be incorporated throughout and thus the community will become familiar with the ongoing process of disaster management. This familiarity will prove to be an important asset itself when the safety committee begins to present its findings to the community.

The safety committee will play a pivotal role in the future of the community. It must be prepared to face the challenge of diverse forces which affect the community and are prone to rapid change. Urban planning practitioners have realized that the process of decision making is very difficult in the modern urban community. Every community is complex and dynamic with many levels of interaction between divergent interests and issues. The uncertainty which surrounds any planning process is further compounded in this context. The safety committee will have to cope with this uncertainty and develop methods to ensure the successful implementation of its policies and recommendations. Once again the experiences of both urban planning and disaster management can contribute to this success.

5.3. The Interface of Two Fields

There is an interface between urban planning and disaster management. The two fields of study share many common goals, practices, theories, and

challenges. In response to a need for such research, as expressed in the literature of both fields, this thesis has explored the strongest of these links and suggested that both fields will benefit from increased connection and cooperation. This thesis has also identified how the two fields may begin to coordinate their efforts and thus achieve their mutual goal of providing a better, safer future for the community.

Chapter One has shown that both fields have identified the possibility of an interface though have not actively promoted its development. The two fields have failed to expand upon the opportunities presented by the interface because the commonalties between them, especially their common goals and means, were not acknowledged. The primary task of the thesis has therefore been to identify commonalties in order to define and highlight the interface.

To achieve this, Chapter Two explored how the commonalties in theory and history support the guiding principles of both fields and discovered a common fundamental goal. Establishing that the two fields share a common, underlying reason for their activities is the most important step to proving that an interface exists because the commonalties in means and philosophy are meaningless without a shared goal.

The means employed by each field to achieve their respective objectives were examined in Chapter Three. This further reinforced the importance of integrating the planning process of the two fields and the necessity, indeed the urgency, of developing stronger linkages. The common philosophy of both fields was discussed in Chapter Four resulting in a better appreciation of how they will mutually benefit from such a relationship. This examination of the common goals, means and philosophy directs the fields

towards a closer symbiotic relationship in which their interdependencies are reinforced.

Finally, Chapter Five discussed a possible means of initiating an interlocking relationship, based on mutualism, between the two fields. While the establishment of a safety committee is encouraged, it is not intended as a final solution. The total integration of disaster management into urban planning, with the mutually beneficial result of improving the planning process and increasing the efficiency of both efforts, must remain the ultimate aim of every community. It must be remembered that the safety committee concept, as discussed above, is only a bridgehead providing an initial step towards complete integration. It is one method of bringing the two practices together in an atmosphere of cooperation that will assist them in recognizing and utilizing the opportunities inherent in the interface of the two fields.

It is clear that there is an interface between the fields of urban planning and disaster management. Currently, however, the two fields operate in parallel, failing to connect despite seeking similar goals. Their differing practical approaches also separate their decision making process and hinder the ability of each to achieve complete success. In practice this separation may even result in negative connections when the decisions and actions of one field impede the efforts of the other. While avoiding such instances should be sufficient reason for coordination there are, fortunately, even more positive justifications for developing a symbiotic relationship.

Seeking a desired future objective is the basis for any planning effort. It is the application and timing of actions which distinguish between different

planning approaches. In the case of urban planning and disaster management, two fields sharing a common goal, it is their approach to the planning process that is critical in separating them. Urban planning currently employs a proactive approach in which a course of actions is determined and then undertaken to ensure a desired outcome. This requires, however, that the desired outcome is properly identified and that undesired outcomes are avoided or eliminated. Currently, urban planning lacks a comprehensive understanding of how its decisions influence interactions between society and the environment and the possibility of negative outcomes. In this respect urban planning stands to benefit from closer ties to the field that is directly focused on these negative outcomes, namely disaster management.

Disaster management, in contrast to urban planning, develops a course of actions to be undertaken only if an undesired outcome is imminent. While this contingency planning approach is suitable for some aspects of the preparedness and response phases of disaster management, it fails to incorporate preventative action which may offer the most efficiency. Effective preventative actions require that the human-use system is properly guided away from hazardous activity. Urban planning is the field mandated to guide the human-use system and is therefore the most appropriate field to implement preventative disaster management actions. Improving the effectiveness of preventative actions reduces the demands placed on the later management phases of preparedness, response, and recovery. Thus integration with urban planning improves all aspects of disaster management.

There is not only an interface between urban planning and disaster management, there is an interdependency. Each field needs the other to successfully accomplish its own objectives. Furthermore, they are both striving toward the common fundamental goal of a safe future for the community, a goal which will only be reached if urban planning and disaster management first succeed in establishing an integrated, symbiotic relationship built on mutualism and cooperation. The current isolation can not be allowed to continue. The fields of urban planning and disaster management, in theory and in practice, must recognize that an interface exists and that active cooperation and coordination are critical to their mutual success and, thus, to the safety and future of the community.

BIBLIOGRAPHY

Albrecht Johann and Gill-Chin Lim. 1986. "A Search for Alternative Planning Theory: Use of Critical Theory". Journal of Architectural and Planning Research. 3(2) pp.117-131

Aldrich, Howard and Peter Marsden. 1988. "Environments and Organizations". Chapter 11 in Smelser, Neil (ed.). Handbook of Sociology. Newbury Park: SAGE Publications. pp.361-392

Alexander, Earnest. 1984. "After Rationality, What? A Review of Responses to Paradigm Breakdown". Journal of the American Planning Association. 50(1) pp.62-69

Altshuler, Alan. 1965. "The Goals of Comprehensive Planning". Journal of the American Institute of Planners. 31(3) pp.186-195

Anderson, Peter, Nathan Edelson, Betty Hansen, Ruth Harding, Kari Huhtala, and Laurie Laughy. 1990. Hazard Management Planning in British Columbia: Issues and Challenges. Emergency Preparedness Planning Series. University of British Columbia Center for Human Settlements

Anderson, Richard. 1987. "Community Planning for Small-Quantity Hazardous Waste Generators". Journal of the American Planning Association. 48(3) pp.454-465

Arora, Chauth. 1976. "Land-Use Maps for Town Planners". in Laconte, Pierre. ed. 1976. The Environment of Human Settlements: Human Well-being in Cities. Proceedings of the Conference held in Brussels, Belgium, April, 1976. Volume 1 Oxford: Pergamon Press. pp.197-220

Bacon, Edmund. 1974. Design of Cities. New York: Penguin Books.

Baker, Earl and Joe McPhee. 1975. Land Use Management and Regulation in Hazardous Areas: A Research Assessment. Program in Technology, Environment and Man. Monograph #NSF-RA-E-75-008. Institute of Behavioral Science. The University of Colorado.

Banai, Reza. 1988. "Planning Paradigms: Contradictions and Synthesis". The Journal of Architectural and Planning Research. 5(1) pp.14-34

Baram, Michael. 1976. Environmemtal Law and the Siting of Facilities: Issues in Land Use and Coastal Zone Management. Ballinger Publishing Co. Cambridge

Barkun, M. 1974. Disaster and the Millennium. New Haven: Yale University Press.

Barnett, Jonathan. 1986. The Elusive City: Five Centuries of Design, Ambition and Miscalculation. New York: Harper & Row, Publishers.

Barton, Allen. 1969. Communities in Disaster: A Sociological Analysis of Collective Stress Situations. Garden City, N.Y.: Doubleday.

Barton, John and Johanna Wellheiser (eds.). An Ounce of Prevention: a Handbook on Disaster Contingency Planning for Archives, Libraries and Record Centers. Toronto: Toronto Area Archivists Group.

Beatley, Timothy. 1984. "Applying Moral Principles to Growth Management". Journal of the American Planning Association. 50(4) pp.459-469

_____. 1989a. "Environmental Ethics and Planning Theory". Journal of Planning Literature. 4(1) pp.1-32

_____. 1989b. "Towards a Moral Philosophy of Natural Disaster Mitigation". International Journal of Mass Emergencies and Disasters. 7(1) pp.5-32

Berke, Philip, Timothy Beatley, and Suzanne White. 1989. "Influences on Local Adoption of Planning Measures for Earthquake Hazard Mitigation". International Journal of Mass Emergencies and Disaster. 7(1) pp. 33-56

Bernknopf, R., D. Brookshire, R. Campbell, and C. Shaprio. 1988. "An Economic and Geographic Appraisal of a Spatial Natural Hazard Risk: A Study of Landslide Mitigation Rules". Environment and Planning:A. Pion Ltd., London, 20(5), pp.621-631

Bisson, B. and F. Wilson. 1991. "Transportation and the Environment - Finding the Right Balance". a paper prepared by the University of New Brunswick Transportation Group for the 1991 Transportation Association of Canada Annual Conference in Winnipeg.

Bolan, Richard. 1974. "Mapping the Planning Theory Terrain" in Godschalk, David. (ed.) 1974. Planning in America: Learning from Turbulence. Washington: American Institute of Planners. pp.13-34

Bolan, Richard. 1983. "The Structure of Ethical Choice in Planning Practice". Journal of Planning Education and Research. 3(1) pp.23-34

Branch, Melville. 1974. Planning Urban Environment. Stroudsburg: Dowden, Hutchinson & Ross, Inc.

Britton, Neil. 1985. The State/Territory Emergency Service as a Constrained Organization within the Australian Disaster Management System. PhD. Thesis. Department of Behavioral Sciences at James Cook University of North Queensland

_____. 1986. " Developing an Understanding of Disaster". Australian & New Zealand Journal of Sociology. 22(2) pp. 254-271

_____. 1987. "Flood Disasters: are we on the right track with our current mitigation practices?". Proceedings of the 27th Annual Flood Mitigation Conference. Penrith. pp.139-162

_____. 1989(a). "Community Attitudes to Natural Hazard Insurance: What are the Salient Facts", in Oliver, John and Neil Britton. (eds.). Natural Hazards and Reinsurance. Proceedings of a Seminar sponsored by Sterling Offices (Australia) Ltd, pp.107-121

_____. 1989(b). "Decision-making In Emergency Organizations Under Conditions of Crisis and Uncertainty". paper prepared for Risk Perception and Response in Australia, Proceedings of a workshop at the Australian Counter Disaster College, Mt Macedon, July 1989, for The Center for Resource and Environmental Studies, The Australian National, Canberra

_____.1991. Organizational and Community Response to a Technological Emergency: Case Study of a Major Incident within a Metropolitan Australian City. Occasional Paper No.6. Armidale: Centre for Disaster Management, University of New England

_____.and John Lindsay. forthcoming. "Integrating City Planning and Emergency Preparedness: Some of the Reasons Why"

_____. and John Oliver. 1991. "Introduction: The Meanings of Hazard." in Britton, Neil and John Oliver (eds.) Natural and Technological Hazards: Implications for the Insurance Industry. Proceedings of a Seminar sponsored by Sterling Offices (Australia) Ltd

Brooks, Stephen. 1989. Public Policy in Canada. Toronto: McClelland & Stewart Inc.

Brown, Jeffery. 1991. "Landslide Control on North Island, New Zealand". The Geographical Review. October pp.457-472

Brundtland, Gro. 1987. Our Common Future: The Report of the World Commission on Environment and Development. Oxford: Oxford University Press

Bryson, John. 1983. "Representing and Testing Procedural Planning Methods". in Masser, Ian (ed.). 1983. Evaluating Urban Planning Efforts. Aldershot: Gower Publishing Co.

Burby, Raymond and Steven French. 1981. "Coping with Floods: The Land Use Management Paradox". Journal of the American Planning Association. 47(2) pp. 289-300

_____. et al. 1991. Sharing Environmental Risks: How to Control Governments' Losses in Natural Disasters. Boulder: Westview Press.

Chang, Semoon. 1983. "Disasters and Fiscal Policy: Hurricane Impact on Municipal Revenue". Urban Affairs Quarterly. 18(4) pp.511-523

Christensen, Karen. 1985. "Coping with Uncertainty in Planning." Journal of the American Planning Association. 51(4) pp. 63-73

Crozier, M. 1981. "The Charater of Natural Hazards in Different Physical and Social Settings." Proceedings of the 11th New Zealand Geographers Conference. pp. 106-109

Dacy, Douglas and Howard Kunreuther. 1969. The Economics of Natural Hazards. New York: MacMillian Co.

David, Elizabeth and Judith. Mayer. 1984. "Comparing Costs of Alternative Flood Hazard Mitigation Plans". Journal of the American Planning Association. 50(1) pp.22-35

Davidoff, Paul. 1965. "Advocacy and Pluralism in Planning". Journal of the American Institute of Planners. 31(4). pp.331-338

de Neufville, Judith. 1981."Land Use: A Tool for Social Policy". in de Neufville, Judith. ed. 1981. The Land Use Policy Debate in the United States. New York: Plenum Press.

Dear, Michael. 1992. "Understanding and Overcoming the NIMBY Syndrome". Journal of the American Planning Association. 58(3) pp.288-300

Dessler, Gary. 1976. Organization and Management: A Contingency Approach. Englewood Cliffs: Prentice-Hall, Inc.

Drabek, Thomas. 1986. Human Systems Responses to Disaster: an inventory of sociological findings. New York: Springer-Verlag.

_____. 1989. "Disasters as Nonroutine Social Problems." International Journal of Mass Emergencies and Disasters. 7(3) pp. 215-241

Driever, Steven and Danny Vaughn. 1988. "Flood Hazard in Kansas City Since 1880". The Geographical Review. 78(1) pp.1-19

Ducsik, Dennis. 1981. "Citizen Participation in Power Plant Siting: Aladdin's Lamp or Pandora's Box ?". Journal of the American Planning Association. 47(1) pp.154-166

Dynes, Russell. 1970. Organized Behavior in Disaster. Lexington: Heath Lexington Books.

Emergency Preparedness Act, 35-36-37 Elizabeth II, Chapter 11, assented to 27th April, 1988

Emergency Preparedness Canada. 1988. "Mayors and Elected Municipal Officials Conference: Fourteen Steps to Readiness." E.P.C. Document 1009. Arnprior. pp.1-2

Ericksen, Neil. 1981. "Shaping Flood-Loss Reduction Policies in New Zealand". Proceedings of the 11th New Zealand Geography Conference. Wellington: New Zealand Geographical Society. pp.123--129

_____. and Bob Barbour. 1985. "Natural Hazards: People and Processes." Proceedings of the 13th New Zealand Geography Conference. Hamilton: New Zealand Geographical Society. pp.132-137

Erikson K. 1976. Everything in Its Path: Destruction of Community in the Buffalo Creek Flood. New York: Simon and Schuster.

Etzioni, Amitai. 1967. "Mixed-Scanning: A 'Third' Approach to Decision-Making". Public Administration Review. 27(5) pp.385-392

Fischhoff, Baruch, Christoph Hohenemser, Roger Kasperson, and Robert Kates. 1978. "Handling Hazards". Environment. 20(7) pp.16-20,32-37

Fleming, Robert, David Varnes and Robert Schuster. 1979. "Landslide Hazards and their Reduction". Journal of the American Planning Association. 45(4) pp. 428-439

Foster, Harold. 1980. Disaster Planning: The Preservation of Life and Property. New York: Springer-Verlag.

French, Steven. and Mark. Isaacson. 1984. "Applying Earthquake Risk Analysis Techniques to Land Use Planning". Journal of the American Planning Association. 50(4) pp.509-522

Friedmann, John. 1987. Planning in the Public Domain: From Knowledge to Action. Princeton: Princeton University Press.

Friedmann, John. 1988. "Reviewing Two Centuries". Society: Transaction Social Science and Modern. 26(1) pp. 7-15

Friesema H, J Caporaso, G Goldstein , R Lineberry, and R McCleary. 1979. Aftermath: Communities After Natural Hazards. Sage Publishers: Beverly Hills

Fritz, Charles. 1968. "Disasters." in D. Sills (ed). International Encyclopedia of the Social Sciences. New York: MacMillian. pp.202-207

Galloway, Thomas and Riad Mahayni. 1977. "Planning Theory in Retrospect: The Process of Paradigm Change". Journal of the American Institute of Planners. 43(1) pp.62-71

Gereke, Kent and Barton Reid. 1991. "Planning, Power and Ethics". Plan Canada. 31(6) pp.59-74

Gibb, Jeremy. 1981. "Coastal Hazard Mapping: A Technique for Wise Planning and Management". Proceedings of the 11th New Zealand Geography Conference. Wellington: New Zealand Geographical Society. pp. 129-135

Godschalk, David and Kathryn Cousins. 1985. "Coastal Management: Planning on the Edge". Journal of the American Planning Association. 51(1), pp.288-298

Goodall, Brian. 1987. Dictionary of Human Geography. Harmondsworth: Penguin Books

Gordon, Steven and Robert Klousner. 1986. "Using Landslide Hazard Information in Planning: An Evaluation of Three Methods". Journal of the American Planning Association. 52(4) pp.431-442

Green, C., S. Tunstall and M. Fordham. "The Risks from Flooding: Which Risks and Whose Perception". Disasters. 15(3) pp.227-236

Haas, Eugene, Robert Kates, and Martyn Bowden. (eds.) 1977. Reconstruction Following Disaster. Cambridge: M.I.T. Press.

Hall, Peter. 1988. Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century. Oxford: Basil Blackwell Ltd.

Harper, T. and S. Stein. 1983. "The Justification of Urban Intervention: a Moral Framework". Environments: A Journal of Interdisciplinary Studies. 15(1) pp.39-47

Harriss, Robert, Christoph Hohenemser, and Robert Kates. 1978. "Our Hazardous Environment." Environment. 20(7) pp. 6-15,38-41

Healy, Robert and Jeffrey Zinn. 1985. "Environment and Development Conflicts in Coastal Zone Management". Journal of the American Planning Association. 51(1), pp. 299-311

Heathcote , R.L, and B.G. Thom. 1979. Natural Hazards in Australia. Sydney: Australian Academy of Science.

Heiman, Michael, 1990, "From 'Not In My Backyard!' to 'Not In Anybody's Backyard!': Grassroots Challenge to Hazardous Waste Facility Siting", Journal of the American Planning Association. 56(4) pp.359-362

Hellriegel, Don and John Slocum. 1976. Organizational Behavior: Contingency Views. St. Paul: West Publishing Co.

Hemmens, George. 1980. "New Directions in Planning Theory". Journal of the American Planning Association. 46(3) pp.259-260

Hendler, Sue. 1990. "Professional Codes as Bridges Between Planning and Ethics: a Case Study". Plan Canada. 30 (2) pp.22-29

Hightower, Henry. 1969. "Planning Theory in Contemporary Professional Education". Journal of the American Institute of Planners. 35(5) pp.326-329

Hoch, Charles. 1984. "Doing Good and Being Right: The Pragmatic Connection in Planning Theory". Journal of the American Planning Association. 50(3) pp.335-345

Hodge, Gerald. 1986. Planning Canadian Communities. Toronto: Methuen.

_____. 1991. "Canadian Community Planning 100 Years On: Where Next?". Plan Canada. 31(6) pp. 15-22

Hyman, Drew and Joe Miller. 1985. Community Systems and Human Services: An Ecological Approach to Policy, Planning, and Management. Kendall/Hunt Publishing Co.

Jackson, Michael and Peter Janssen. 1990. "Disaster and the Moral Appraisal of Corporate Actions" International Journal of Mass Emergencies and Disasters. 8(3) pp.341-360

Jacobs, Jane. 1961. The Death and Life of Great American Cities. London: Jonathan Cape.

Kaiser, Edward. et al. 1974. Promoting Environmental Quality Through Urban Planning and Controls. University of North Carolina, prepared for the Office of Research and Development. U.S. Environmental Protection Agency. Washington, D.C.

Kaiser, Edward, Raymond Burby, Scott Bollens, and James Holway. 1987. "Private Sector Land Market Decision Agants as Targets of Flood Plain Policy". International Journal of Mass Emergencies and Disasters. 5 (3) pp. 311-335

Kartez, Jack. 1984. "Crisis Response Planning: Toward a Contingent Analysis". Journal of the American Planning Association. 50(1) pp.9-21

Kartez, Jack. and Michael Lindell. 1987. "Planning for Uncertainty: The Case of Local Disaster Planning". Journal of the American Planning Association. 53(4) pp.487-498

Kast, Fremont and James Rosenzweig (eds.). 1973. Contingency Views of Organization and Management. Chicago: Science Research Associates, Inc.

_____. and James Rosenzweig. 1985. Organization and Management: A Systems and Contingency Approach. New York: McGraw-Hill Book Co.

Kates, Robert, Christoph Hohenemser, and Jeanne Kasperson. eds. 1985. Perilous Progress: Managing the Hazards of Technology. Boulder: Westview Press.

Kates, Robert. 1971. "Natural Hazards in Human Ecological Perspective: Hypothesis and Models." Economic Geography. 47, pp.438-51

Klosterman, Richard. 1980. "A Public Interest Criterion". Journal of the American Planning Association. 46(3) pp.323-333

Knox, Paul. 1987. Urban Social Geography. New York: Longman Scientific & Technical (John Wiley and Sons, Inc.)

Kreps, Gary. 1984. "Sociological Inquiry and Disaster Research." Annual Review of Sociology. 10, pp.309-330

_____. 1989. "Future Directions in Disaster Research: The Role of Taxonomy." International Journal of Mass Emergencies and Disasters. 7(3) pp. 215-241

_____. 1991. "Organizing for Emergency Management" in Drabek, Thomas and G. Hoetmer (eds.) Emergency Management: Principals and Practice for Local Government. International City Management Association. Washington. pp.30-54

Kroll-Smith, Steve and Stephen Couch. 1992. "What is a Disaster? An Ecological-Symbolic approach to Resolving the Definitional Debate." International Journal of Mass Emergencies and Disasters. pending

Lafond, R. 1985. "Emergency Planning for the Elderly". Emergency Preparedness Digest. E.P.C. Ottawa

Laughy, Laurie. 1990. A Planner's Handbook for Emergency Preparedness. Emergency Preparedness Planning Series. University of British Columbia Center for Human Settlements

Lawrence, David. 1992. "Planning and Environmental Assessment: Never the Twain Shall Meet?". Plan Canada. July pp.22-27

Lawrence, J. 1981. "Approaches to Natural Hazard Planning in Urban Areas." Proceedings of the 11th New Zealand Geographers Conference. New Zealand Geographical Society. pp. 109-112

Lawrence, Paul and Jay Lorsch. 1967. Organization and Environment: Managing Differentiation and Integration. Boston: Division of Research, Graduate School of Business Administration, Harvard University

Legget, Robert. 1973. Cities and Geology. New York: McGraw-Hill Book Co.

Lindblom, Charles. 1959. "The Science of 'Muddling Through'". Public Administration Review. XIX (2) pp.79-88

Lindsay, John. 1991. Report on the Proceedings of the 1991 National Conference on Disaster Management in Hamilton. prepared for the Disaster Research Unit, University of Manitoba, 47pp.

_____ 1992. personal notes on "Emergency Plan in your Community", presented by Hal Roebuck, Municipal Manager, Manitoba Emergency Measures Organization, at the 1st Annual St. John Ambulance Conference, November 28th, Winnipeg

Lowrance, William. 1976. Of Acceptable Risk: Science and the Determination of Safety. Los Altos: William Kaufmann Inc.

_____. 1983. "The Agenda for Risk Decisionmaking". Environment. 25(10) pp.4-8

Luthans, Fred. 1976. Introduction to Management: A Contingency Approach. New York: McGraw-Hill Book Co.

Marcuse, Peter. 1976. "Professional Ethics and Beyond: Values in Planning". Journal of the American Institue of Planners. 42(3) pp.264-274

Mazmanian, Daniel and Paul Sabatier. 1983. Implementation and Public Policy. Glenview: Scott, Foresman and Company

Mazur, A. 1987. "Does Public Perception of Risk Explain the Social Response to Potential Hazard?" Quarterly Journal of Ideology. 1 pp.41-45

McAllister, Donald. ed. 1973. Environment: A New Focus for Land-use Planning. Washington: National Science Foundation.

McEachern, Wayne. 1991. "Transit-Friendly Land-Use Planning: A Key Ingredient Supporting Urban Environmental Quality and Economic Development". Plan Canada. 31(5) pp.15

McGahan, Peter. 1986. Urban Sociology in Canada. Toronto: Butterworth and Co., Ltd.

Metcalfe, Sarah. 1991. "The Human Impact on the Environment". Geography. 76(2) pp.59-60

Meyer, Micheal and Peter Belobaba. 1982 "Contingency Planning for Response to Urban Transportation System Disruptions". Journal of the American Planning Association. 48(3) pp.454-465

Mileti, Dennis. 1980. "Human Adjustment to the Risk of Environmental Extremes". Sociology and Social Research. University of Southern California. 64(3) pp.327-47

_____. 1987. "Sociological Methods and Disaster Research". in Dynes, R., C. Pelanda, and B. de Marchi (eds.). 1987. Sociology of Disasters: Contribution of Sociology to Disaster Research. Milan: Franco Angeli.

Miller, Christopher. 1990. "Development Control as an Instrument of Environmental Management". Town Planning Review. 61(3) pp.232-245

_____. and Geraldine Bachman. 1984. "Planning for Hurricanes and Other Coastal Disturbances". Urban Land. Jan. 1984, pp.18-23

Myerson, Roger. 1991. Game Theory: Analysis of Conflict. Harvard University Press. Cambridge.

Nawaz, Rasheeda. 1991. "Sustainable Urban Development for Ottawa: Planners Can Make a Difference". Plan Canada. 31(6) pp.54-58

Newstrom, John, William Reif and Robert Monczka (eds.). 1975. A Contingency Approach to Management: Readings. New York: McGraw-Hill

O'Connor, Rochelle. 1978. Planning under Uncertainty: Multiple Scenarios and Contingency Planning. a research report (No.741) from The Conference Board, Management Research Division. New York: The Conference Board Inc.

Ontario Ministry of the Solicitor General. 1991. Emergency Planning: A Guide to Emergency Planning for Municipal Officials. Toronto: Emergency Planning Ontario.

Organization of American States. Department of Regional Development and Environment. 1991. Primer on Natural Hazard Management in Integrated Regional Development Planning. OAS/DRDE. Washington

Palm, Risa. 1987. "Pre-Disaster Planning: The Response of Residential Real Estate Developers to Special Studies Zoning". International Journal of Mass Emergencies and Disasters. 5(1) pp. 95-102

Parker, D. and D. Harding. 1979. "Natural Hazard Evaluation, Perception and Adjustment." Geography. 64 (4) pp. 307-316

Parr, Arnold. 1987. "Disasters and Disabled Persons: An Examination of the Safety Needs of a Neglected Minority". Disasters. 11(2) pp.148-159

Perrow, Charles. 1984. Normal Accidents: Living with High-Risk Technologies. New York: Basic Books, Inc.

Petak, William, and Arthur Atkisson. 1982. Natural Hazard Risk Assessment and Public Policy: Anticipating the Unexpected. New York: Springer-Verlag.

Pivo, Gary, Cliff Ellis, Michael Leaf, and Gerald Magutu. 1990. "Physical Planning Thought: Retrospect and Prospect". The Journal of Architectural and Planning Research. 7(1) pp.53-69

Preston, Valerie, Martin Taylor, and David Hodge. 1983. "Adjustment to Natural and Technological Hazards: A Study of an Urban Residential Community." Environment and Behavior. 15(2) pp.143-164

Quarantelli, Enrico (ed.) 1978. Disasters: Theory and Research. London: SAGE Publications.

_____. 1987(a). "What Should We Study? Questions and Suggestions for Researchers about the Concept of Disasters." International Journal of Mass Emergencies and Disasters. 5(1) pp.7-32

_____. 1987(b). "Criteria Which Could be Used In Assessing Disaster Preparedness Planning and Managing." Preliminary Paper #122, Delaware: Disaster Research Center, University of Delaware. pp.1-14

_____. 1988. "Planning and management for the prevention and mitigation of natural disasters, especially in a metropolitan context: Initial questions and issues which need to be addressed." Planning for Crisis Relief: Towards Comprehensive Resource Management and Planning for Natural Disaster Prevention. Vol.3. Japan

_____. 1989. "Conceptualizing Disasters from a Sociological Perspective." International Journal of Mass Emergencies and Disasters. 7(3) pp. 243-251

_____. and R. Dynes. 1977. "Response to Social Crisis and Disaster." Annual Review of Sociology 1977. Annual Reviews Inc. pp. 23-49

Reps, John. 1965. The Making of Urban America: A History of City Planning in the United States. Princeton: Princeton University Press

Richardson, Nigel. 1987. Land Use Planning and Sustainable Development in Canada. Canadian Environmental Advisory Council.

Rossi, Peter, James Wright and Eleanor Weber-Burdin and J. Pereira. 1983. Victims of the Environment: Losses from Natural Hazards in the United States 1970-1980. New York: Pleum Press

_____., James Wright and Eleanor Weber-Burdin. 1982. Natural Hazards and Public Choice: The State and Local Politics of Hazard Mitigation. New York: Academic Press

Schaffer, Daniel. (ed.) 1988. Two Centuries of American Planning. Baltimore: The John Hopkins University Press.

Scott, Mel. 1969. American City Planning Since 1890. Berkeley: University of California Press.

Seasons, Mark. 1991. "Planning for Uncertain Futures: Thoughts for Practice". Plan Canada. 31(6) pp.31-38

Self, Peter. 1981. "Planning: Rational or Political?". in Baehr, Peter. and Bjorn Wittrock (eds.). 1981. Policy Analysis and Policy Innovation. London: SAGE Publications

Sherman, Larry, and John Livey. 1992. "The Positive Power of Conflict". Plan Canada. March pp.12-16

Short, James. 1989. "On Defining, Describing and Explaining Elephants (and Reactions to Them): Hazards, Disasters, and Risk Analysis." International Journal of Mass Emergencies and Disasters. 7(3) pp. 397-418

Simpson, Michael. 1985. Thomas Adams and the Modern Planning Movement: Britain, Canada, and the United States, 1900-1940. London: Mansell Publishing.

Sjoberg, Gideon. 1962. "Disasters and Social Change." in Baker, G. and D. Chapman. (eds.) Man and Society in Disaster. New York: Basic Books.

Smith, Michael. 1979. The City and Social Theory. New York: St. Martin's Press.

Smithson, Michael. 1990. "Ignorance and Disasters". International Journal of Mass Emergencies and Disasters. 8(3) pp.207-235

Snyder, Janice. 1991. "Special Emergency Circumstances: Helping Those Who Can't Help Themselves". Emergency Preparedness Digest, E.P.C., Oct.-Dec. 1991

Stallings, Robert. 1991. "Disasters as Social Problems?: A Dissenting View." International Journal of Mass Emergencies and Disasters. 9(1) pp. 69-74

Sverdrup Corporation, 1987, "Washington Harbour: 'Invisible' Protection from the 100-Year Flood", Urban Land, November, 1987, pp.30-31

Szechenyi, John. 1992. "Managing Environmental Issues and Conflict". Plan Canada. March pp.17-19

Tierney, Kathleen, 1989, "Improving Theory and Research on Hazard Mitigation: Political Economy and Organizational Perspectives", International Journal of Mass Emergencies and Disasters, 7(3) pp.3647-396

Town of Selkirk. 1988. Town of Selkirk Emergency Plan. Resolution No. 246/88 of the Town of Selkirk, July 25, 1988 (amended April 23, 1990).

Turner, Barry. 1976. "The Development of Disasters - A Sequence model for Analysis of the Origins of Disasters." The Sociological Review New Series. Keele: University of Keele. Nov. 1976, pp. 753-774

Turner, Ralph. 1989. "Taxonomy as an Approach to Theory Development?" International Journal of Mass Emergencies and Disasters. 7(3) pp.265-275

Walker, G. and S. Macgill. 1985. "Planning Control of Industrial Hazard in a Major Metropolitan Planning Authority". Environment and Planning B. Pion Ltd. 12(4) pp. 463-479

Weiler, John. 1992. "Making Places Livable: A Collaborative, Consensual Approach". Plan Canada. January 1992, pp.30-36

White, Gilbert. 1974. Natural Hazards: Local, National, Global. New York: Oxford Press.

_____.1979. "Natural Hazards Policy and Research Issues" in Heathcote, R.L, and B.G. Thom. 1979. Natural Hazards in Australia. Sydney: Australian Academy of Science. pp. 15-22

_____. 1986. "Defusing Natural Disasters: Introduction to Symposium". Journal of the American Planning Association. 52(4) pp.429-430

_____. and Eugene Haas. 1975. Assessment of Research on Natural Hazards. Cambridge: M.I.T. Press.

Whittow, John. 1979. Disasters: The Anatomy of Environmental Hazards. Athens: The University of Georgia Press.

Wildavsky, Aaron. 1973. "If Planning is Everything, Maybe it's Nothing". Policy Science. 4(2) pp.127-153

Wilson, William. 1988. "The Seattle Park System and the Ideal of the City Beautiful" Chapter Five in Schaffer, Daniel. (ed.) 1988. Two Centuries of American Planning. Baltimore: The John Hopkins University Press. pp.113-137.

Wright, James, Peter Rossi, Sonia Wright, and Eleanor Weber-Burdin. 1979. After the Clean-up: Long Range Effects of Natural Disasters. Sage Publishers: Beverly Hills

Wyner, Alan. 1984. "Earthquakes and Public Policy Implementation in California". International Journal of Mass Emergencies and Disasters. 2(2) pp. 267-284