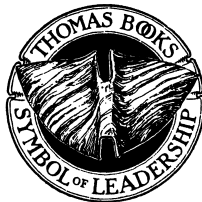

Disciplines, Disasters and Emergency Management

DISCIPLINES, DISASTERS AND EMERGENCY MANAGEMENT

The Convergence and Divergence of Concepts,
Issues and Trends from the Research Literature

Edited by

DAVID A. McENTIRE



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For Kimberly and our children.

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Dr. Cruz has completed research concerning assessment of risk management and emergency response practices for natural disaster triggered technological (Natech) disasters in the United States, Europe and Japan. Dr. Cruz's research interests include developing methodologies for measuring preparedness capacity and establishing indicators for preparedness for multiple and simultaneous technological accidents; analysis of cascading failures at industrial establishments during natural disasters; and analysis of risk management of soil contamination problems in areas subject to high natural hazard risk. Dr. Cruz is currently developing a rapid assessment tool for diagnosis of Natech risk in urban areas in Japan, and is working with the Joint Research Centre of the European Commission on development of a typology of Natech disasters, as well as development of Natech hazard maps for selected European countries. Her research findings have been presented at national and international conferences, including the recent United Nations' International Conference on Disaster Reduction in Davos, Switzerland in August 2006 and the World Conference on Disaster Management held in Toronto, Canada in June 2006. Dr. Cruz has received several fellowships and grants from the National Science Foundation, Tulane University, the Japan Society for Promotion of Research and the United Nations' International Strategy for Disaster Reduction to conduct research on Natech disasters in Louisiana and California, Turkey, Japan, and Europe. Dr. Cruz is the author of several articles in *Natural Hazards Review*, *Earthquake Spectra*, *Journal of Risk Research* and *Emergency Management Canada*. In addition, she recently contributed with a book chapter to an instructor guide for the Federal Emergency Management Agency. Prior to joining the European Commission, Dr. Cruz was a faculty member at University of North Texas and a research fellow at the Disaster Prevention Research Institute at Kyoto University.

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In 1993 he was appointed by the U.S. Department of Justice and the U.S. Department of the Treasury to present prospective recommendations on how federal law enforcement agencies should manage complex hostage/barricade situations such as the stand-off that occurred near Waco, Texas. Dr. Louden has testified about police practices and procedures before the NYC Council Committee on Public Safety and the US Commission on Civil Rights. He served as a Co-convenor of *Urban Hazards Forum Two (2003)*; *Homeland Security After 9/11*, and a presenter at *Urban Hazards Forum One (2002)*; *Terrorism-Catastrophic Events-Mitigation*, a series of conferences sponsored by FEMA-Region II and John Jay College of Criminal Justice. Robert J. Louden earned a Bachelor of Business Administration degree from Baruch College and an MA from John Jay College of Criminal Justice. He later received the Master of Philosophy and Doctor of Philosophy degrees from the Graduate School of CUNY.

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Preface

“**H**ow does one conduct research on disasters at the Graduate School of International Studies?” This was the question posed several years ago after I introduced my academic interests to other students on the first day of a seminar on development.

I admit – rather reluctantly – that the professor’s inquiry took me by surprise. Not only did I fumble unsuccessfully through my attempt to satiate his curiosity, but the resulting incredulity to my response made me contemplate switching schools as well as fields. The experience proved to be valuable, however, in that subsequent reflection and further research has convinced me that disasters can and should be studied by those interested in international relations, comparative politics and policy analysis.

The first of these fields provides the context for the creation of emergency management in the United States (e.g., the impact of the Cold War on civil defense) and it enables scholars to understand the actors involved in international humanitarian activity as well as the unacceptable barriers that inhibit disaster mitigation and preparedness across national borders. The second field helps students comprehend the plethora of problems that must be overcome if disasters are to be reduced in developing nations. And the latter academic area is beneficial as it provides the tools necessary to assess the strengths and weaknesses of disaster policies at the domestic and international levels. Thus, international studies *may* certainly offer unique contributions to the rapidly growing disaster studies field.

Beyond this, it can be argued that international studies *must* add to the vital knowledge base about natural and human-induced catastrophes. The 9/11 terrorists attacks dramatically altered the nature and direction of emergency management in North America, and the current emphasis on homeland security stresses the importance of addressing international grievances and doing more to prevent or prepare for the possible use of weapons of mass destruction. In addition, little is known about disasters in other countries (comparatively speaking), which hinders the transfer of lessons learned and suggests a bleak future for the vast majority of the planets inhabitants. Furthermore, calamitous events have a variety of direct and indirect consequences on all countries, and growing interdependence will ensure that catastrophes in distant locations will be felt in one way or another around the world. Scholars in these branches of the social sciences therefore have a responsibility to generate knowledge about disasters in all nations, and alert the citizens and leaders of the United States to the fact that immunity from the consequences of calamity in developed or developing nations is a fallacy.

If it is true that international studies can and should participate in the ongoing discussion about how to reduce disasters, it is only a reflection of the state of disaster research as a whole. This important area of investigation has always been examined from various disciplines. Besides natural/physical scientists and engineers, other key participants include sociologists, political scientists, psychologists, anthropologists, urban planners, development scholars, students of emergency management and many others from diverse academic backgrounds. Because of this disparate set of contributors, there has never before been as great a need to integrate research findings for practitioners.

Accordingly, this edited volume attempts to do that: synthesize what is known about calamities in order to assist those policymakers and emergency managers who seek to reverse the disturbing trends of disasters in the United States and elsewhere around the world. Nonetheless, it is hoped that this work will also foster further discussion among the academic community. Considerable effort has been given to the assessment of past and current research findings as well as anticipated needs within and across the most salient fields of study related to disasters. In this sense, the book may help solidify multidisciplinary research in the disaster studies field and serve as a springboard for truly interdisciplinary scholarship for the future. The following work should therefore be read with the above issues and goals in mind.

Acknowledgments

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The views and opinions expressed herein are those of the authors and do not necessarily reflect the views and opinions of the Federal Emergency Management Agency.

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Disciplines, Disasters and Emergency Management

The Importance of Multi- and Interdisciplinary Research on Disasters and for Emergency Management

David A. McEntire

ABSTRACT

This introductory chapter discusses the emerging consensus among scholars and practitioners for multi- and interdisciplinary approaches to disasters and emergency management. It explains why such this strategy is deemed necessary and highlights the benefits of moving beyond explanations emanating from single or separate fields of study. The chapter then outlines what the reader can expect from the book and concludes with a discussion about barriers inhibiting disciplinary convergence and how they might be overcome.

INTRODUCTION

In any given emergency or disaster, numerous actors from the public, private and non-profit sectors arrive at the affected area to protect life, minimize human suffering, overcome social disruption, deal with the destruction of property and clean up a degraded environment. This convergence, as it is widely known, is not limited to post-disaster activities or the profession of emergency management. Disaster scholarship is increasingly multi- and interdisciplinary.¹

Researchers from various disciplines study natural, technological and civil/conflict hazards, and explore their interaction with the causes and consequences of vulnerability. The following edited volume discusses research findings and issues important to each discipline in the hope of finding points of intersection as well as gaps in the literature. In so doing, the contributing authors also generate recommendations to more effectively reduce the impact of disasters.

This introductory chapter discusses a growing consensus among scholars and practitioners for multi- and interdisciplinary approaches to disasters and emergency management. It explains why this strategy is deemed necessary and highlights the benefits of moving beyond explanations emanating from single or separate fields of study. The chapter then outlines what the reader can expect from the book and concludes with a discussion about barriers inhibiting disciplinary convergence and how they might be overcome.

A GROWING CONSENSUS

There appears to be much agreement that multi- and interdisciplinary approaches are needed to understand and effectively deal with the complex problems

1. Multidisciplinary research includes studies from various disciplines that are not always synthesized in a holistic and unified fashion. Interdisciplinary research, on the other hand, includes findings from diverse fields of study that are integrated in a complex but more coherent manner. The first is easier, but limited in theoretical and practical rewards; the latter is much more difficult, but is most likely to generate new knowledge for the solution of problems facing emergency management.

of our day. This is the case in academia in general but practitioners also appear to value inclusiveness of divergent viewpoints. Edward O. Wilson's book, *Consilience: The Unity of Knowledge* (1999), is a great example of this trend in scholarship. Writing from the perspective of a Scientific Materialist who is interested in environmental conservation, Wilson asserts that we will be unable to resolve the problems we are faced with if we do not integrate knowledge from the natural and social sciences. We accordingly must rely on "consilience," or the jumping together or blending of facts and theory from several disciplines. He states, "as we cross [the boundaries of several disciplines] . . . we find ourselves in an increasingly unstable and disorienting region. The ring closest to the intersection [of various disciplines], where most real-world problems exist, is the one in which fundamental analysis is most needed" (Wilson 1999, p. 10). Wilson therefore believes multidisciplinary perspectives take into account reality and are most apt to generate solutions for complicated challenges. His research is typical of many efforts among scholars to span conceptual issues and diverse fields of study (e.g., information sciences, environmental studies, bio-engineering and chemistry, etc.).

Practitioners in a variety of professions also share an affinity in synthesizing knowledge and bridging gaps across functional areas. For instance, those working in Public administration must have an understanding of politics, economics, and management as well as the issues pertaining to transportation, public health, human resources and urban development, among other things. The current concern about terrorism also involves several areas of expertise. According to Richard A. Falkenrath:

Men and women from dozens of different disciplines – regional experts, terrorism analysts, law enforcement officials, intelligence officers, privacy specialists, diplomats, military officers, immigration specialists, customs inspectors, specific industry experts, regulatory lawyers, doctors and epidemiologists, research scientists, chemists, nuclear physicists, information technologists, emergency managers, firefighters, communications specialists, and politicians, to name a few – are currently involved in homeland security (in Damien 2006, xxvi).

Many careers now require employees to be ever-learning, willing to seek out valuable information about subjects and topics previously believed to be

foreign or irrelevant. And more individuals are finding it in their benefit to do so. It is reported that Wayne Hale, an engineer and Deputy Space Shuttle Program Manager at NASA's Space Center in Houston, said, "you laugh, but when you talk about culture and how people subconsciously deal with hierarchy and where they fit in within an organization and whether they feel comfortable in bringing things up. . . . I'm wishing I'd taken more sociology courses in college." Knowledge bases that were once held sacrosanct and sufficient are now believed to be isolated and incomplete.

Such views about the importance of integrated research activities are especially prevalent in disaster studies and emergency management. Several decades ago Gilbert White and Eugene Haas recognized that "little attempt had been made to tap the social sciences to better understand the economic, social, and political ramifications of extreme natural events" (cited by Mileti 1999, 1). However, today, Ehren Ngo asserts "ideally, disaster research is multidisciplinary, and understanding the impact of disasters . . . requires a synthesis of various disciplines" (2001, 81). For instance, Mileti observes that "hazards research now encompasses disciplines such as climatology, economics, engineering, geography, geology, law, meteorology, planning, seismology, and sociology" (1999, 2), and his book, *Disasters by Design*, is a notable example of combining diverse knowledge sets from an eclectic group of well-known scholars. Britton also states "disaster research and its close companions (hazard research and risk research) and their application in the emergency management context is becoming more multidisciplinary" (1999, 229). Cutter and her colleagues agree that the study of disaster "is an interdisciplinary endeavor and spans the divide between the social, natural, engineering and health sciences" (2003, 7).

Conference panels, including one comprised of Earnest Paylor, Dennis Wenger and David Applegate, have been devoted to "A Holistic Assessment of Hazards" (see the 2004 *Natural Hazards Workshop*). In that session, Havidán Rodríguez examined the "role, contributions and complexities of interdisciplinary research" (2004). Others have likewise tried to take an interdisciplinary approach in their research, albeit with a slightly different focus. McEntire gives priority to the concept of vulnerability

along with its attendant components, and he has illustrated their unique relation to several hazards, phases, actors, functions, and variables that influence the impact of disasters² (2004; 2003; 2002; 2002) (see Table 1.1). His work also illustrates a close relation to several disciplines (see Table 1.2). Acknowledging the presence of interdisciplinary research in the field, Brenda Phillips (2003) asks an interesting question to which there may be no clear or definitive answer: “is emergency management a discipline or a multidisciplinary endeavor?” Grunfest and Weber seem to agree with the latter view – that “emergency managers are of no one particular discipline; likewise, the information they need is not limited to the purview of any one scientific discipline” (1998, 59).

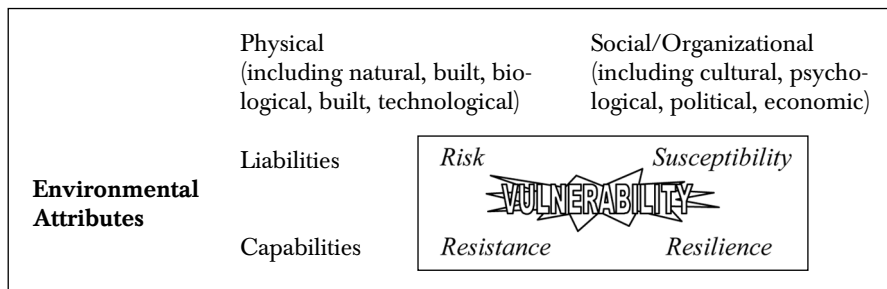
Those working in the disaster field share sentiments similar to scholars. In response to the tragic Tsunami in Southeast Asia, the Public Entity Risk Institute held a conference for risk managers in 2005. It was entitled “Early Warning Systems: Interdisciplinary Observations and Policies from a Local Government Perspective.” Business continuity planners also appear to value the varied activities of their disaster partners. The theme for the 2005 *Contingency Planning and Management Conference* in Las Vegas was “The Future is Convergence: Discover the Synergy among Business Continuity, Emergency Management and Security.” Emergency managers, too, share

interest in expanding the number of agencies participating in disaster reduction and response.

The need for multi- and interdisciplinary research is not limited to scholars and practitioners in the United States. An edited book by Mario Garza Salinas and Daniel Rodríguez (1998) bears the title *The Disasters of Mexico: A Multidisciplinary Perspective*. At the 2003 *FEMA Higher Education Conference*, Neil Britton, a scholar and practitioner respected around the Pacific Rim, declared “theory has to transcend disciplines.” Empirical studies from around the world also suggest a growing interest in collective research methodologies. Ronan et al. (2000) assert that “dialogue needs to involve members of the volcanological community and its multidisciplinary team colleagues.” Moving beyond a single disciplinary approach is undoubtedly gaining global acceptance.

As a result of this agreement, there is a concomitant realization that we must utilize multi- and interdisciplinary approaches in emergency management education. Bob Reed (one of the first faculty members in the Emergency Administration and Planning Program at the University of North Texas) is reported to have said virtually every discipline is related to disasters, perhaps with the exception of modern dance³ (Neal, 2000, 429). Mileti believes “education in hazard mitigation and preparedness should therefore expand to include interdisciplinary and holistic

Table 1.1
ENVIRONMENTS



Adapted from McEntire, David A. 2001. “Triggering Agents, Vulnerabilities and Disaster Reduction: Towards a Holistic Paradigm.” *Disaster Prevention and Management* 10(3): 189–196.

2. McEntire (2005) believes we are able to influence and determine our vulnerability to hazards, and not necessarily control the hazards themselves.

3. It could even be argued that modern dance is related to disasters, because emergency medical care might be needed if one is not coordinated!

Table 1.2

<i>Discipline</i>	<i>View(s) of Vulnerability</i>	<i>Recommendation(s)</i>
Geography	Vulnerability is determined by the use of hazard-prone areas	Land-use planning that takes into account hazards to reduce risk
Meteorology	Vulnerability is due to a lack of advanced warning of severe weather	Acquisition, creation and effective use of warning systems
Engineering	Vulnerability occurs when structures and infrastructure cannot withstand the forces of hazards	Design and construction of buildings and infrastructure that promotes disaster resistance
Anthropology	Vulnerability emanates from constraining values, attitudes and practices	Alter attitudes to discourage risk-taking practices and susceptibility
Economics	Vulnerability is related to poverty and results in an inability to prevent, prepare for or recover from a disaster	Improve the distribution of wealth and purchase insurance to minimize losses and promote resilience
Sociology	Vulnerability is a product of inaccurate assumptions about disaster behavior and is related to race, gender, age, disability, etc.	Understand behavioral patterns in disasters and pay attention to needs of special populations
Psychology	Vulnerability is a function of overlooking or minimizing risk and not being able to cope emotionally with stress and/or loss	Help people to recognize risk and provide crisis counseling to enable resilience
Epidemiology	Vulnerability is susceptibility to disease or injury and is related to malnutrition and other health factors	Improve provision of public health/emergency medical care before, during and after disasters
Environmental Science	Vulnerability is proneness to environmental degradation, which may change weather patterns and produce long-term disasters	Conserve natural resources, protect green space areas, and ensure that debris management is performed in an environmentally conscious manner
Political Science	Vulnerability is produced by the political structure and incorrect decision making	Alter structure of political system and educate politicians and legislators about disasters
Public Administration	Vulnerability results from misguided laws, the failure to implement policies effectively, and an inability to enforce regulations	Strengthen response and recovery capabilities through preparedness measures, improved policy implementation and increased code enforcement
Law	Vulnerability results from negligence, which is a failure to act as reason or legal statutes dictate	Understand the law, alter statutes, and ensure compliance to widely accepted ethical practices in emergency management
Journalism	Vulnerability is a result of insufficient public awareness about hazards and how to respond to disasters	Dispel myths about disasters, foster increased media capabilities, and educate the public about hazards
Emergency Management	Vulnerability is the lack of capacity to perform important functions before and after disaster strikes (e.g., evacuation, search and rescue, public information, etc.)	Foster public awareness about disasters and build capacities through hazard and vulnerability analyses, resource acquisition, planning, training and exercises
Homeland Security	Vulnerability is due to cultural misunderstandings, permeable borders and fragile infrastructure, and weak disaster management institutions	Correct domestic and foreign policy mistakes, enhance counter-terrorism measures, protect borders and infrastructure, and improve WMD capabilities

Adapted from McEntire, David A. 2003. "Searching for a Holistic Paradigm and Policy Guide." *International Journal of Emergency Management* 1(3): 298-308.

degree programs” (1999, 13). He continues, “interdisciplinary problem-focused degree programs would provide professionals with the tools needed to access new knowledge from those educated in more traditional ways and would facilitate the application of interdisciplinary solutions to tomorrow’s problems” (1999, 259). Many academic programs in emergency management have heeded or preceded this counsel (see one example in Table 1.3).

THE NEED FOR MULTI- AND INTERDISCIPLINARY RESEARCH

Studying disasters from the perspective of different disciplines and assimilating their findings should not be viewed as an end unto itself. Instead, multi- and

interdisciplinary research should be regarded as the means to better understand disasters and more effectively formulate and implement disaster policies. There are a number of reasons why this is the case.

First, scholars and practitioners are increasingly aware that we are experiencing more hazards today in terms of number and diversity. There are a number of natural hazards that may affect us including, but certainly not limited to, earthquakes, tsunamis, tornadoes, hurricanes, floods, droughts, wildfires, landslides, avalanches and other events triggered above, on, or below the earth. There is also the possibility of more anthropogenic-related incidents such as computer disasters, infrastructure failures (blackout), hazmat releases, industrial explosions, railroad derailments, and intentional disasters such as plane hijackings, anthrax attacks or suicide bombings. Beyond

Table 1.3
CURRICULUM OF THE EADP PROGRAM

<p>University Core, including:</p> <ul style="list-style-type: none"> • Technical Writing • Earth Science, Introduction to Physical Geology or Environmental Science • Interpersonal Communications or Public Speaking 	<p>Electives Outside the Major:</p> <ul style="list-style-type: none"> • Public Administration • American Intergovernmental Relations • Public Policy Analysis • Biological Resource Conservation and Management • Community and Public Service • Introduction to Philanthropy and Fundraising • Social Evolution of Contemporary Fundraising • Proposal Writing and Grants Administration • Volunteer Management Concepts and Applications • Community Resource Mapping and Collaboration • Volunteer Program Planning and Evaluation • Cartography and Graphics • Medical Geography • Map-Air Photo Analysis • Meteorology • Introduction to Geographic Information Systems • Environmental Geology • Risk Management • Workplace Health and Safety • Collective Behavior • Sociology of Disaster
<p>Major Core:</p> <ul style="list-style-type: none"> • Introduction to Emergency Management • Hazard Mitigation and Preparedness • Disaster Response and Recovery • Leadership and Organizational Behavior (or Public Management) • Capstone Course in Emergency Management • Financial Aspects of Government • Internship Preparation • Internship Practicum 	
<p>Electives Within the Major:</p> <ul style="list-style-type: none"> • Images of Disasters in Film and Media • Hazardous Materials Planning and Management • Private Sector Issues • Special Populations and Disasters • Technology and Emergency Management • Terrorism and Emergency Management • The Federal Government and Disasters • Flood Plain Management • Public Health and Disasters 	

these hazards, humans may be faced with biological threats such as SARS, Avian Flu, West Nile, AIDS, Hoof and Mouth disease, etc. With this in mind, Thomas and Mileti assert that the “hazards managers of the future will require an understanding of a wider variety of hazards. Few will have the option of only considering a single hazard, but instead must be more broadly trained to consider the full range of hazards that exist in a given area, including natural, technological and terrorist hazards” (2003, 18). Of course, we must take into account the fact that hazards are not isolated and they often interact one with another. For instance, an earthquake may cause a landslide or the breach of a dam. A wildfire may threaten a nuclear power plant or an industrial facility. A terrorist attack may include the sabotage of infrastructure, or the use of chemical or biological weapons. Future emergency managers must have an appreciation for complex, compound or cascading disasters.

Second, emergency management includes various functions across many phases. Activities in this profession include: hazard and vulnerability assessments, land-use planning, structural mitigation, the passing of laws and ordinances, code enforcement, education of politicians and citizens, planning, training, exercises, warning, evacuation, sheltering, debris management, and donations management. Other measures to be taken are continuity of government, volunteer management, traffic control, fire suppression, damage assessment, disaster declaration, mass fatality management, emergency medical care, public information, individual assistance, public assistance, decontamination, WMD detection, environmental restoration, etc. Such steps are integral to emergency management, although finding the proper balance among mitigation, preparedness, response and recovery activities is difficult to obtain (Thomas and Mileti, 2003, 17).

A third reason why it is important to take a multi- or interdisciplinary approach is because there are so many actors involved in emergency management. At the *Designing Educational Opportunities for Emergency Managers Workshop* in Denver in 2003, Ellis Stanley, the Emergency Manager of Los Angeles, stated that in his city departments from Aging to the Zoo have an important role in preventing or responding to disasters. Emergency managers are undoubtedly not the only participants in emergency management, although

they do play a central role. Additional actors include politicians, flood plain managers, fire and police officials, building code inspectors, meteorologists, representatives of the American Red Cross, business continuity planners, and volunteers of religious organizations. There are numerous others in state and federal government. In many ways, the lines and boundaries among the levels of government and all departments, agencies and organizations in the public, private and non-profit sectors are blurring (e.g., homeland security needs the support and involvement of local jurisdictions and businesses to be effective). Expertise and experience in any given sector is not enough due to the current disaster setting.

These points suggest that the traditional disciplines involved in emergency management may not be able to address – in spite of their long history of excellent contributions to the field – every issue or answer question relating to disasters. Furthermore, the traditional approach to the study of emergency management is incomplete or does not work. It is incorrect to assume that we can study hazards and problems of vulnerability, develop alternative policy options concerning what functions and phases to address, choose one route to pursue, and move on to the next concern (Mileti 1999, 27). In most cases, challenges are interrelated and complex, and solutions are multifaceted with both advantages and disadvantages. “Buy in” and collaboration among all participants are also vital for success.

THE MERIT OF DIVERSE AND INTEGRATED FINDINGS

The advantages of multi- and interdisciplinary studies are noteworthy. Collective research projects have the distinct benefit of recognizing the unique and evolving world of disasters. Thomas and Mileti declare:

Emergency management is different than it was a decade ago, and not yet what it will be in the future. It is more complex and includes many more topics than it did just a few years ago. Emergency/hazards management includes mitigation, preparedness, response and recovery. It demands knowledge and skills in the natural and physical sciences, the social and behavioral sciences, aspects of engineering, and technology. Emergency/hazards