The Intersection of Critical Infrastructure and Emergency Management

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The international community faces a series of disasters each year that causes thousands of deaths and costs billions of dollars in recovery aid, disruption of commerce, and destruction of homes and critical infrastructure.
INTRODUCTION

Risk to disasters is increasing

Population growth will inherently result in an increase in places prone to disasters

Nexus between safety and sociocultural respect presents a variety of administrative challenges

It is the essential role of government to manage focusing events

Emergency management is the discipline of avoiding risks to hazards and dealing with both natural and manmade disasters in an effort to lessen their impact

Began in 1980s
Rooted in public administration
Process orientation of developing policies
Cycle-based framework
Academic field and community of practice
A BRIEF HISTORY

Piecemeal approach
   Existed since early 1800s
   Rampant fires spread across New Hampshire
   7th Congress pass number of relief measures

Broader stance began in the 1930s
   Onset of the Great Depression
   Reconstruction Finance Corporation to stimulate economic activity

Independent agency
   Between 1960 and 1978 disaster relief was created by the Federal Disaster Assistance Administration

Cabinet level position
   Executive Order 12148 by President Carter established the Federal Management Administration
CURRENT STATE

Independent agency
Reversal of attention back on civil defense through the establishment of Department of Homeland Security in 2002
Merged 22 agencies into a single department
Focus on federal response and recovery measures
Administration is determined ACTION taken in pursuit of a conscious PURPOSE. It is the systematic ORDERING of affairs and the calculated USE of resources aimed at making those happen which one wants to happen.

~Karl Marx
1. Mitigation
Preventing future emergencies or minimizing their effects

2. Preparedness
Preparing to handle an emergency

3. Response
Responding safely to an emergency

4. Recovery
Recovering from an emergency
CONCEPTUALIZING DISASTERS

DISASTER – a deadly, destructive, and disruptive event that occurs when a hazard interacts with human vulnerability

HAZARD – source of danger that poses a threat to life, health, property, or the environment

RISK – the susceptibility to death, injury, damage, destruction, disruption, stoppage, etc.

VULNERABILITY – proneness of people to hazards and risk based on varying factors as demographics and location, etc.
DETECTING HAZARDS

Process of identifying what hazard is about to occur, or what disaster has just taken place

Each is different and requires various methods of detection
  Senses, field feedback, dispatch, radio traffic, news, volunteers,
  meteorological/geological services, incident networks, hospitals,
  technology, etc.

Initial measures for detection center on the six serving men
  WWWW
NATURAL HAZARDS
- Rooted in natural environment
- Considered acts of God
- Not preventable
- Associated with perceived lack of control

HUMAN-INDUCED HAZARDS
- Caused by humans
- Result of human intent, negligence, error, or system failure
- Not predicted, thought to be preventable
- Identifiable parties to be held accountable
- Associated with perceived loss of control
DISASTER TERMINOLOGY

Emergency – an unforeseen event that calls for immediate intervention and urgent care to prevent the continued risk to life, health, property, or the environment.

Crisis – an abrupt event in which the turning point for a situation may become unstable and occur with little or no warning, negatively affecting an individual, group, community, or society.

Calamity – an event of great misfortune in which a situation is seriously marked by great loss and lasting distress and suffering.

Catastrophe – a violent and destructive event ranging from extreme misfortune to utter overthrow or ruin.
RUN GOOGLE ANALYTICS VIEWER
FRAMING DISASTERS TODAY

Disasters are socially constructed phenomena

Consequences of disasters are often broad-based, long-term, and unanticipated

Examining the connection between social capital and political trust is paramount:
  Political trust is vulnerable
  Social capital can be weakened
  Remediation strategies have consequences
PLACE MATTERS

Place is part of human identity

Society is characterized by shared experiences

Tradition is not the only source of values

Social and political action takes place within shared histories
ISSUE IDENTIFICATION

The extent of social beliefs, political attitudes, and economic perspectives vary.

Ideologies differ among a range of issues.

Characterizing issues is a critical factor in defining problems.
DETERMINING VULNERABILITY

Geographic location
   Country, state, city

Demographic factors
   Race, gender, age, education, income, etc.

Other factors
   Growing population
   Persistent poverty
   Drawn urbanization
   Increased diversity
   Enhanced globalization
   Further industrialization
   Improper land use and inadequate construction
   Expanding sense of entitlement
EVEN MORE VULNERABILITY

Weak emergency management

Humans are dependent upon the climate they live in

Changes in global average temperature have always occurred

Impacts natural environment as a vicious cycle

Caused by several factors:
  Plate tectonics (millions of years)
  Orbital fluctuations (hundreds of thousands of years)
  Milankovitch theory are cycles as based on eccentricity, tilt, and procession
  Atmospheric variations (any time)
HIGH THREAT PARADIGM

Threats are no longer normal and static

Assailants are engaging in entrepreneur-like activities with the support of technology

There is no longer a lack of imagination but, instead, a lack of adaptability
SO WHAT IS A HIGH THREAT

Atypical emergencies and complex attacks include active shooters, riot violence, marauding, etc.

Complex attacks differ due to the lack of any indication of a long term planning process or prior preparation

Key difference is that a coordinated attack requires the indication of insurgent long term planning
Infrastructure resilience: “Enhance the ability of critical infrastructure systems, networks, and functions to withstand and rapidly recover from damage and disruption and adapt to changing conditions.”
ENERGY SYSTEMS

Sustainable and resilient energy grids (electric and pipelines) critical
Energy production and distribution systems owned by private sector
Public/private sector cooperation necessary for disaster response planning and anticipating future challenges of integrating decentralized power into existing infrastructure
Understanding “codependent” infrastructure networks important
WATER SYSTEMS

Water is one of the most important “codependent” networks
Restoration of powers to water pumping facilities critical
Climate change causing either water shortages or flooding
Meeting these water-related challenges involves both public-private partnerships and community engagement
TRANSPORTATION SYSTEMS

Transportation (and communications) systems depend on reliable energy infrastructure to function after a disaster. Without power, fuel pumps do not work to keep people and goods moving. As electric vehicles (EVs) become more important, restoring electric power for charging EVs is crucial. Looking further ahead, EVs may become secondary storage for increasingly decentralized electric power distribution grids.
COMMUNICATION SYSTEMS

Increasingly complex (and integrated) communications systems heightened importance of robust cybersecurity policy

As energy grids decentralize and require functioning communications systems, an integrated response is necessary for enhanced resilience and sustainability

The pace of technology change in the communications sector has outstripped the ability of policy makers and power grid operators to understand vulnerabilities and effectively respond to disasters
NEXUS BETWEEN CRITICAL SYSTEMS

Continuity Planning for Critical Infrastructure

Financial and Political Risks to Critical Infrastructure Resilience
IMPLICATIONS OF CRITICAL INFRASTRUCTURE FOR EMERGENCY MANAGEMENT

There are long-term trends and drivers in critical infrastructure which have implications for emergency management

-- Aggressiveness with which infrastructure construction is pursued

-- Whether the public or private sector is expected to fund infrastructure

-- Continuing to rely on large, centralized infrastructure projects or moves toward developing smaller-scale projects

-- The incorporation of technology into physical infrastructure

-- The government’s role in providing and securing information infrastructure
CONNECTION OF CIP TO EMERGENCY MANGEMENT

Emergency managers will be greatly affected by how the nation approaches infrastructure over the next few decades

-- Aging or failing infrastructure

-- Poor land use planning

-- Reliance on information networks
DIFFICULTIES REMAIN

- Crisis-reactive approach
- Hazard zone attraction
- Fragmented systems perspective

DECISION REMEDIES

- Designing preferable models such as the 3C’s
- Situational awareness
- Think critically
- Try to return to a period of normalcy as quickly as possible
GLOBAL CHALLENGES

Disasters occur within a limited geography

Traditional crisis models have typically focused on post-crisis response

Policymakers are ill equipped to handle many of the social, environmental, and economic elements

If communal networks are disrupted, there will be a lasting impact on the community
LOCAL SOLUTIONS

Understanding disaster meaning is essential to problem-solving.

Increased communication and enhanced cooperation should be viewed as a relevant means to ideological bridge building.

Decision-making models have highlighted a need for collaborative partnerships.

A framework for emergency operations should be developed in an integrated manner.
A New Framework
An Integrated Approach to Resiliency and Sustainability

(utilization of the 3 C’s)

- Increased Communication
- Enhanced Coordination
- Meaningful Collaboration
Future Prescriptions

It has become important for decision-makers to ask/answer questions of why, where, and why there.

Policymakers have attempted to reduce the impacts associated with disasters by *anticipating the unexpected*.

Given the *limited opportunities* for crisis-related experience, decision-making, mental models, and situational awareness, research on crises have highlighted a further need for effective emergency management.

Local authorities are becoming the *force multipliers* for state and federal officials in addressing new hazards and threats.
THANK YOU & QUESTIONS

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