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Hazard Mitigation Planning in the United States: Historical Perspectives, Cultural Influences, and Current Challenges

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1. Introduction

Planning for disasters at the federal, state, and local level is a relatively recent area of focus within the practice of emergency management in the United States. Historically, emergency management as a practice was focused on response to a disaster, with little attention paid to preparation, recovery, or overall and ongoing activities to reduce the effects of disasters. The theoretical framework and literature demonstrates the importance of planning as an activity which impacts the success of many other emergency management activities, yet practice has shown that planning is not always a valued or highly prioritized practice at the local level. The Disaster Mitigation Act of 2000 marked the first legislative emphasis on planning and mitigation and recent studies by the authors have shown mixed results for the implementation of planning laws. This chapter reviews in detail the historical developments in the theory and practice of planning with special emphasis on hazard mitigation planning; provides a theoretical framework based on the literature for understanding the importance of local level planning within the national system of emergency management, and the complexity that arises within that system; and discusses ongoing challenges in the successful completion of planning activities in the 21st century due to ongoing administrative and cultural challenges.

2. Hazard mitigation before and during the cold war

Understanding hazard mitigation in the United States first requires an understanding of how emergency management activities evolved historically. E. L. Quarantelli, one of the leaders in disaster sociology, described the beginnings of disaster research as "almost exclu-

sively supported by the U.S.A. military organizations with very practical concerns about wartime situations" [1]. He notes that these "organized research activities [occurred] from about 1950 to 1965" and their primary goals were civil organization in wartime situations, under the assumption that "morale is the key to disaster control," and "effective disaster control includes the securing of conformity to emergency regulations" and "the reduction and control of panic reactions" [1]. The federal government took further action during the 1950s by undergoing several reorganizations within the Department of Defense (see [2]). Prior to, and during that time, the federal government was mainly concerned with civil defense, so that "private, voluntary agencies such as the American National Red Cross, the Salvation Army, and many others bore the primary responsibility for disaster relief; and state and local governments coped as best they could" [2]. Federal assistance was available as an absolute last resort by way of "special assistance acts passed by Congress" [2]. However this system had been operating essentially without change since 1803, and due to its reactive nature, there were "frequent delays before federal assistance reached impacted areas, and the nature of the assistance was designated only for selected purposes" [2].

Two interesting notes about the observations in [1] and [2]: first, the basis of government activity in emergency management emerged from a military and national defense perspective. The first "emergencies" in this regard were wars, or attacks from outside invaders. This militaristic approach – managing a disaster as enemy attack – would shape emergency management significantly in later years. Second, governmental activities in early years were largely reactive. Planning, particularly with an emphasis on mitigation, is not mentioned. A reactive war approach may seem antiquated outside of the Cold War context, but it is essential to understanding the development and decisions of current sentiments toward planning within local governments. As will be discussed in later sections, the defense mentality is still the dominant approach to loss prevention at the local level, and helps explain actions at all levels of government, in all modern aspects of emergency management.

3. The four phases of emergency management

In 1979, a report by the National Governor's Association was published on the topic of emergency management, and defined the general practice as:

A state's responsibility and capability for managing all types of emergencies and disasters by coordinating the actions of numerous agencies. The comprehensive aspect of [emergency management] includes all four phases of disaster or emergency activity: mitigation, preparedness, response, and recovery. It applies to all risks: attack, man-made, and natural, in a federal-state-local partnership (see Table 1).

The four phases listed- mitigation, preparedness, response, and recovery- serve as the current model of emergency management, are widely used among practitioners, and are considered the starting point for all policy and program design for all types of hazards at all

levels of government. The NGA Report included only suggested actions for each phase, which were not operationally defined until 1985:

1. Mitigation- assessing the risk posed by a hazard or potential disaster and attempting to reduce the risk;

2. Preparedness- developing a response plan based upon the risk assessment, training response personnel, arranging for necessary resources, making arrangements with other jurisdictions for sharing of resources, clarifying jurisdictional responsibilities, and so on;

3. Response- implementing the plan, reducing the potential for secondary damage, and preparing for the recovery phase; and

4. Recovery- reestablishing life support systems, such as repairing electrical power networks, and providing temporary housing, food, and clothing. Recovery is assumed to stop short of reconstruction. [3]

In the years following the development of the NGA model, a number of scientific studies (summarized in Table 1) sought to define each phase in more detail. These definitions are still widely used today.

Author	Preparedness	Response	Recovery	Mitigation
NGA Report, 1979 [4]	Developing a response plan and training first responders to save lives and reduce disaster damage, including the identification of critical resources and the development of necessary agreements between responding agencies	Providing emergency aid and assistance, reducing the probability of secondary damage, and minimizing problems for recovery operations.	Providing immediate support during the early recovery period necessary to return vital life support systems to minimum operation levels, and continuing to provide support until the community returns to normal.	Deciding what to do where a risk to the health, safety, and welfare of society has been determined to exist; and implementing a risk reductive program
Petak, 1985 [3]	[D]eveloping a response plan based upon the risk assessment, training response personnel, arranging for necessary resources, making arrangements with other jurisdictions for sharing of resources, clarifying jurisdictional responsibilities, and so on.	Implementing the plan, reducing the potential for secondary damage, and preparing for the recovery phase	Reestablishing life support systems, such as repairing electrical power networks, and providing temporary housing, food, and clothing	Assessing the risk posed by a hazard or potential disaster and attempting to reduce the risk

Author	Preparedness	Response	Recovery	Mitigation
Comfort, 1985 [5]	Cities should review, exercise, and update their plans regularly based on staffing and past performance. Counties and states may review summarized local plans to identify resource needs and coordinate multijurisdictional exercises. FEMA may review state plans and adjust resources accordingly, as well as facilitate coordination between states.	Hierarchy proceeds from city, to county, to state, to federal. At the local level, responders make regular reports on status of life and property, assistance requests, at regular intervals. County, state, and federal designate aid, collect and analyze reports, summarize for next highest level and continue until basic systems are restored.	Assess damage and formulate short-term and long-term goals for rebuilding, including costs, needed equipment, and aid opportunities; ask for public input and improve rebuilt structures where possible; create schedule. All levels except city should identify and implement opportunities for inter-jurisdictional aid.	Conduct annual risk & vulnerability assessment with public involvement. Identify and formulate mitigation goals, and assign to appropriate agencies. County, state, and federal offices should monitor incoming reports and progress, allocate necessary resources, identify opportunities for inter-jurisdictional cooperation, and report to the next highest level.
Waugh, 1990 [6]	Activities that develop operational capabilities for responding to an emergency (e.g. emergency operations plans, warning systems, emergency operations centers, emergency communications networks, emergency public information, mutual agreements, resource management plans, and training and exercises for emergency personnel	Activities taken immediately before, during, or directly after an emergency that save lives, minimize property damage, or improve recovery; e.g., emergency management plan activation, activation of emergency systems, emergency instructions to the public, emergency medical assistance, manning EOCs, reception and care, shelter and evacuation, search and rescue	Short-term activities that restore vital life support systems to minimum operating standards and long-term activities that return life to normal; e.g., debris clearance, contamination control, disaster unemployment assistance, temporary housing, and facility restoration.	Activities that reduce the degree of long-term risk to human life and property from natural and man-made hazards, e.g., building codes, disaster insurance, land-use management, risk mapping, safety codes, and tax incentives and discentives.
FEMA, 2012 [7]	Actions that involve a combination of planning, resources, training, exercising, and organizing to build, sustain, and improve operational capabilities. Preparedness is the process of identifying the personnel, training, and equipment needed for a wide range of potential incidents, and developing jurisdiction-specific plans for delivering capabilities when needed for an incident.	Immediate actions to save lives, protect property and the environment, and meet basic human needs. Response also includes the execution of emergency plans and actions to support short-term recovery.	The development, coordination, and execution of service- and site-restoration plans; the reconstitution of government operations and services; individual, private-sector, nongovernmental, and public-assistance [housing and restoration] programs; long-term care and treatment of affected persons; [social, political, environmental, and economic restoration]; [identification of] lessons learned; postincident reporting; and development of [mitigation]initiatives	Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities… [F]ix the cycle of disaster damage, reconstruction, and repeated damage. These activities or actions… will have a long-term sustained effect.

Author	Preparedness	Response	Recovery	Mitigation
Summary	*Threat assessment (TA)	*Activation of Emergency Protocol (AEP)	*Damage Assessment (DA)	*Improved reconstruction (Recon II)
	*Resource assessment & acquisition (RA&A)	*Medical assistance and first aid (EMS)	*Clean-up (De-con)	*Legislative planning (LP)
	*Inter and intra-jurisdictional cooperation	*Shelter & Evacuation (S&E)	*Restoration of critical systems & facilities (Restor)	*Regularly scheduled vulnerability & risk assessments (VRA)
	*Drills & Exercises (D&E)	*Search & Rescue (S&R)	*Providing temporary basic needs (TBN)	
	*Writing a plan (Plan)	*Secondary Damage Reduction (SDR)	*Basic reconstruction (Recon I)	

Table 1. Four Phase Model Definitions

The four phases are widely considered to be overlapping and cyclical (Figure 1). Mitigation activities occur in all phases of a disaster, and frequently are most evident during reconstruction, which has since been informally added by practitioners as a part of the long-term recovery phase. The ongoing, ubiquitous nature of mitigation activities makes this the hardest phase to clearly define with a beginning and end point. As reconstruction and recovery near completion, lessons learned from these phases are incorporated into preparedness activities with additional mitigation in mind, which in turn are set aside when a response becomes necessary. Hazard Mitigation Plans are easiest to study within the context of the Planning phase, instead of Mitigation. According to the federal policy described later, mitigation, recovery and even some response activities are directed by state and local Hazard Mitigation Plans. Although risk assessment, defined here to be part of the mitigation, is a critical step in authoring a HMP, the entire process will be grouped into the Preparedness phase for simplicity. This is also due to the complex nature of risk assessment as a separate activity, and a tolerance for imprecision in the HMP approval process. Within the context of the Four Phase model, Preparedness, and specifically plan creation, at each level of government is described in the next section.

3.1. Planning for disaster in federal, state, and local government

The role of local-level emergency planning within the national emergency management framework is one of great importance. Federal government provides direction and goals for local planners, but primarily serves as a financial supporter when governments are unable to meet these goals. Likewise, the state acts as a regional conduit between federal and local government, providing aid to its local jurisdictions as needed. This concept, known as shared governance, is a reflection of American attitudes about self-governance. In their book exploring policy implementation issues within the federal government, May and Williams [8] cited, as an example of this mindset, the Elementary and Secondary Education Act of 1965, which marked the first time in U.S. history that the federal government assumed a direct funding role in public education. Although American government was deliberately designed in this fashion, it can cause a dilemma:

On the one hand, federal officials have a strong stake in promoting hazard mitigation and preparedness but little direct control over the effectiveness of such efforts. On the other hand, in the aggregate, sub-national governments and individuals owning property in hazardous areas directly control the effectiveness of mitigation and preparedness policies, but for the most part actions consistent with such policies are low on their list of priorities. [8]
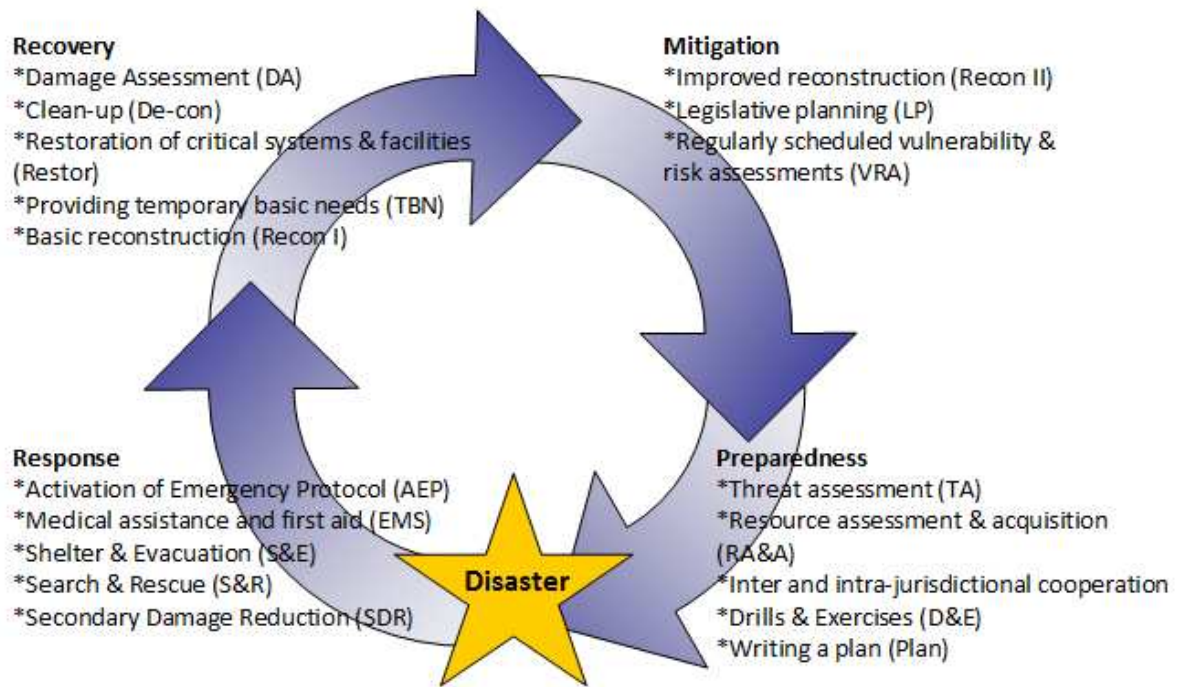

Figure 1. The cyclic nature of the Four Phase Model

In the following sections, emergency planning at each phase of government will be discussed, with particular emphasis on local response to the recent federal demands for Hazard Mitigation Plans.

3.2. What is a hazard mitigation plan?

Before discussing how Hazard Mitigation Plans are completed within the government, it is worth briefly considering: what exactly is a Hazard Mitigation Plan? The Disaster Mitigation Act of 2000 [9] only lists two requirements for local mitigation plans, stating that the plans "shall (1) describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan; and (2) establish a strategy to implement those actions" [P.L. 106-390 § 322(b)]. FEMA's Interim Final Rule (The Rule) provides much more specific requirements based on these guidelines. In summary, a Hazard Mitigation Plan must include:

1.   Documentation of the planning process;

2. A risk assessment, including: (i) a description of the type, location, and extent of all natural hazards that can affect the jurisdiction, including previous occurrences and (ii) a description of the jurisdictions vulnerability to the hazards. Vulnerability should be described in terms of: (A) types and numbers of existing infrastructure, (B) an estimate of potential dollar losses to vulnerable structures, and (C) a description of land uses and development trends. (iii) "For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area."

3. A mitigation strategy, including: (i) long-term mitigation goals, (ii) a description of specific actions for new and existing structures, and (iii) an action plan for how the above will be implemented, prioritized by cost-benefit analysis.

4. A plan maintenance process, including: (i) a description of maintenance for the plan on a five-year cycle, (ii) a process, if possible, to incorporate mitigation efforts into other aspects of local planning, and (iii) a discussion on continuing public maintenance of the plan.

5. Documentation that the plan has been formally adopted by all participating jurisdictions [44 CFR 201.6(c)].

Because the legal style of The Rule can be tedious and lacking examples, FEMA published a series of how-to guides for state and local mitigation planning [10]. The first four guides listed are considered the "Core Four" of HMPs, with the remaining guides available for those jurisdictions as applicable:

1. Getting started with the mitigation planning process, including important considerations for how you can organize your efforts to develop an effective mitigation plan (FEMA 386-1);

2. Identifying hazards and assessing losses to your community, State, or Tribe (FEMA 386-2);

3. Setting mitigation priorities and goals for your community, State, or Tribe and writing the plan (FEMA 386-3);

4. Implementing the mitigation plan, including project funding and maintaining a dynamic plan that changes to meet new developments (FEMA 386-4);

5. Evaluating potential mitigation actions through the use of benefit-cost review (FEMA 386-5);

6. Incorporating special considerations into hazard mitigation planning for historic properties and cultural resources, the topic of this how-to guide (FEMA 386-6);

7. Incorporating mitigation considerations for manmade hazards into hazard mitigation planning (FEMA 386-7);

8. Multi-Jurisdictional Mitigation Planning (FEMA 386-8); and

9.   Finding and securing technical and financial resources for mitigation planning (FEMA 386-9).

All of the guides have a similar format of listing the specific subsection of The Rule, and then provide an explanation, a list of required activities, recommended activities, and examples for how to implement the specific part of The Rule in a clear, non-legal style.

The eighth volume of the How-To Guide, published in 2006 (386-8), is titled "Multi-Jurisdictional Mitigation Planning" and provides guidelines for this specific type of local plan authorship. Although there are many ways to organize a multi-jurisdictional plan, the guide recommends a specific structure to follow; the common portion of the plan may include the "process, common hazards, general mitigation goals, collaborative actions, and [plan] maintenance [schedule]." The items unique to each participating jurisdiction that may be included are: "geographically specific hazards, risks, specific [mitigation] goals, actions, participation, and adoption" [10]. In other words, the number of activities for which the costs would fall exclusively to a single jurisdiction has already been reduced.

If a plan is to be submitted as a multi-jurisdictional HMP, 386-8 provides specific requirements that must be met at each stage of the process. FEMA 386-8 makes recommendations for how to implement the requirements, and tips and examples for following the recommendations. Since the recommendations are not mandatory, and each jurisdiction is unique, the recommendations are not included in summary table. One critical component for multi-jurisdictional plans however, is "documentation" or "proof or adoption" is required from participating single jurisdictions. This refers to city or county resolutions that were passed in the individual jurisdictions to adopt the regional or multi-jurisdictional mitigation plan.

With regard to plan participation, the organization of multiple jurisdictions generally follows three models: Direct Representation, Authorized Representation, and a combination of the two. The first involves sending "direct representatives" to the plan author, who coordinates the creation of the plan. For the second, the individual jurisdictions will authorize the plan author to act on their behalf, usually through city or county resolution [10]. A combination of the two can also be created. Any or all of the models are acceptable, but may lead to different cost situations.

3.2.1. Planning at the federal and state level

As the U.S. exited the Cold War, emergency management at all levels of government continued to evolve and in 1974 with The Disaster Relief Act was enacted. The primary goal of the Disaster Relief Act was to update the federal response and relief system described earlier, and to grant more power to the federal government to provide aid in the immediate aftermath of a disaster. In 1979, following the Disaster Relief Act, the Federal Emergency Management Agency (FEMA) was formed. While FEMA remains the national organization for emergency management, past structuring of the federal bureaucracy has shown that these institutions are frequently replaced. Predecessors to FEMA include: The Office of Civil and Defense Mobilization (1958), the Office of Emergency Preparedness (1961), The Civil Defense Preparedness Agency (1972), and finally the Federal Emergency Management Agency

in 1979 (see [2]). Each of these contained multiple sub-organizations concerned with different areas of emergency management, and operated within a wide range of government groups, from the Department of Defense (DOD) to Housing and Urban Development (HUD) [2]. As a result of the terrorist attacks on September 11, 2001, FEMA was brought under the auspices of the newly created Department of Homeland Security (DHS); and after a controversial response to Hurricane Katrina in 2005 CNN reported that a congressional committee was calling for the abolition of FEMA [11].

After the changes made at the federal level during 1970s, policy continued to evolve through amendments to the Disaster Relief Act of 1974 with the Robert T. Stafford Disaster Relief and Emergency Assistance Act (1988), and the Disaster Mitigation Act (2000). Each amendment encourages localities to "focus on individual and community infrastructures," unless the disaster is beyond their ability to manage [12]. Further, "if the disaster exceeds the state's capacity to respond … the state governor [is allowed] to request aid from the national government. FEMA evaluates the request, prepares material for presidential approval, and coordinates the federal response" [12]. Local and state governments now officially bore the responsibility for emergency planning, although federal response capacity had been expanded.

The Disaster Mitigation Act of 2000 was significant because by its own title was the first law to emphasize the mitigation and preparedness phases of the Four Phase model, rather than "relief" or "assistance" as before; this was achieved by expanding Section 404 of the Stafford Act, which authorized the Hazard Mitigation Grant Program (HMGP) as a means by which jurisdictions *that had received presidential declarations of disaster* could apply for and receive federal assistance for mitigation projects. An additional program, for Pre-Disaster Mitigation grants (PDMs), was instituted so that a presidential declaration was not a requirement to apply for funding directed at mitigation activity; however the application process is separate, nationally competitive, and less familiar than that of the HMGP; and often the amount of money made available for funding applications through presidential declarations is substantially higher. In amending Section 404 of the Stafford Act, Section 322(a) of the Disaster Mitigation Act required state and local mitigation plans to be in place before any applications were made to the HMGP:

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a condition of receipt of an increased Federal share for hazard mitigation measures…a State, local, or tribal government shall develop and submit for approval to the President a mitigation plan that outlines the processes for identifying the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government.

The Disaster Mitigation Act provided a legal foundation for FEMA to author an Interim Final Rule under the Federal Register (44 CFR Parts 201 and 206). As discussed in the previous section, the Rule provides specific clarification, based on the Disaster Mitigation Act, for receiving funding through FEMA under the HMGP. Beginning at the state level, a state can

either have a Standard or Enhanced Mitigation Plan that will result in a 15% or 20% increase in HMGP funding, respectively. The state is also allowed to use up to 7% of the HMGP funding to cover the expenses of writing state, local, or tribal plans. As of November 2007, 48 states had approved Standard Plans, and two states were waiting for approval on submitted plans. Seven of the 48 states with approved plans had also elevated their status to having approved Enhanced Plans, showing the state-level implementation of plans was highly successful. The Rule explicitly states that "[t]o be eligible to receive HMGP project grants, local governments must develop Local Mitigation Plans that include a risk assessment and mitigation strategy to reduce potential losses and target resources. Plans must be reviewed, revised, and submitted to us for approval every 5 years" (p. 8847). Local Mitigation Plans are also referred to as Hazard Mitigation Plans (HMPs), or Mitigation Action Plans, by FEMA and local planners alike. An important note for later discussions on the cultural influences in local planning, The Rule further specifies that "[m]ulti-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan. State-wide plans will not be accepted as multi-jurisdictional plans" [44 CFR § 201.6(3)].

To encourage a fast response to the new local-level planning requirements, The Rule originally set a deadline of November 1, 2003. Prior to that date, writing plans and applying for funding through the HMGP could be done simultaneously. In October 2003 the deadline was changed to November 1, 2004 with an amendment in the Federal Register, stating that "local governments must have an approved mitigation plan in order to receive project grants under any Notice of Funding Opportunity [including PDMs] issued after November 1, 2003 [fiscal year 2004 and later]" (p. 61368). Interestingly, this legislation used a limitation of access to federal grants to motivate local governments to create HMPs.

From this sequence of bureaucratic re-organization and policy implementation, it is clear that planning for disasters at the federal level has involved maintaining a reliable response and relief capacity, and passing the planning responsibilities to state and local government. This is not counterintuitive however, as local residents have a better understanding of their areas, and would be the first to respond during a disaster.

3.2.2. Planning at the local level

While federal and state governments are easily recognizable, it is worth considering the definitions of local government when considering the planning that occurs there. The U.S. Census Bureau provides rigorous definitions for city governments, and a certain set of criteria that must be met for a local government to be considered legitimate. FEMA accepts plans from a wide variety of local governments, including tribal governments and individual school districts. When conducting any analysis on HMPs, a distinction should be made for which types of governments are under consideration. Councils of governments are not defined by the census bureau, and may take a variety of forms depending on the needs of localities within a region. According to the National Association of Regional Councils (NARC), a regional council, or council of governments, is defined as:

…a multi-service entity with state and locally-defined boundaries that delivers a variety of federal, state and local programs while continuing its function as a planning organization, technical assistance provider and "visionary" to its member local governments. As such, they are accountable to local units of government and effective partners for state and federal governments [13].

In support of the notion within emergency management that inter-organizational coopera‐ tion is crucial, [13] believes "the role of the regional council has been shaped by the chang‐ ing dynamics in federal, state and local government relations, and the growing recognition that the region is the arena in which local governments must work together to resolve social and environmental challenges."

As emergency management evolves and becomes more advanced, the earlier quotation from [8] becomes more relevant. Recall that:

On the one hand, federal officials have a strong stake in promoting hazard mitigation and preparedness but little direct control over the effectiveness of such efforts. On the other hand, in the aggregate, sub-national governments and individuals owning property in haz‐ ardous areas directly control the effectiveness of mitigation and preparedness policies, but for the most part actions consistent with such policies are low on their list of priorities [8].

Because of increased globalization, a community that was once relatively isolated might now house critical facilities for a distant parent company. Sociologist Arjen Boin notes how deeply systemic and interlinked society as become, allowing the effects of disaster to spread and multiply more rapidly than in the past, and stressing the need for improved local disas‐ ter planning:

First, Western societies become increasingly dependent on complex systems to deliver most basic tasks ranging from garbage collection to national defense. Second, the various subsys‐ tems become increasingly tightly coupled, which means that a disturbance in one system rapidly propagates toward another [14].

All levels of government participate in some way in all levels of emergency management, creating a complex system of interlinked activities. Ultimately though, the entire structure of emergency management in the United States, and within the Four Phase model, depends on preparedness at the local level. This concept is aptly publicized by the planning require‐ ments within the Disaster Mitigation Act and FEMA's Interim Final Rule. Despite general consensus that local preparedness is essential, its execution has traditionally been of mini‐ mal quality, low priority, and host to a multitude of administrative problems. These are dis‐ cussed in the following sections.

3.2.2.1. What constitutes preparedness?

Returning to the Four Phase model of emergency management proposed in 1979 by the NGA, the report failed to provide definitions for the phases; instead, suggested activities were included. For the preparedness phase, the NGA recommended:

Developing a response plan and training first responders to save lives and reduce disaster damage, including the identification of critical resources and the development of necessary agreements among responding agencies, both within the jurisdiction and with other jurisdictions [6].

Six years later, the NGA was better able to define each phase (see Table 1). Preparedness was defined as:

Developing a response plan based upon the risk assessment, training response personnel, arranging for necessary resources, making arrangements with other jurisdictions for sharing of resources, clarifying jurisdictional responsibilities, and so on. [14]

An interesting similarity between both definitions is that they encourage cooperation with other jurisdictions. Although this cooperation has appeared low on the list of priorities of local planners for reasons discussed later, recent research has shown multi-jurisdictional co-operation to be almost exclusively responsible for the creation of HMPs [15].

As the understanding of emergency planning and hazards progressed, a number of re-searchers would recommend activities that led to an increased state of preparedness for lo-cal emergency managers (see [16]). After the terrorist attacks of September 11, 2001, [16] revisited these activities, summarized and combined the work that had been done previous-ly, and suggested ten guidelines for increased preparedness within the newfound context of terrorism as a viable threat. In summary, the ten steps are:

1. Base planning activities "upon accurate knowledge of the threat and of likely human responses;"

2. encourage an appropriate, rather than quick or impulsive, response;

3. emphasize "response flexibility so that those involved in operations can adjust to changing disaster demands;"

4. address inter-organizational coordination;

5. "integrate plans for each individual community hazard managed into a comprehensive approach for multi-hazard management;"

6. include a training program so that all involved parties are familiar with the plan, in-cluding elected officials and the general public;

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7. test the plan with drills and exercises;

8. recognize that "planning is a continuing process;"

9. recognize that due to the nature of local government culture [see Section 2.2.3.2.3], "emergency planning… is almost always conducted in the face of conflict and resistance;" and

10. 1recognize that a plan is only ever truly tested and improved upon "with its implementation in an emergency" (adapted from [16]).

The authors note that "often, there is a tendency to equate emergency planning with the presence of a written plan and similarly believe that a written plan is evidence of jurisdictional preparedness" [16]. In fact, as demonstrated in the ten guidelines, planning is a dynamic process. Emphasizing a written plan may not be a bad idea, given the requirements of the Hazard Mitigation Grant Program; however a possible future task for policy might be to highlight the process rather than the written document.

Combining the definitions of the NGA Four Phase model with [4] and [16], preparedness within the context of emergency management is best thought of as a cyclic process, much like the Four Phase model, which consists of threat assessment, resource assessment and acquisition, inter- and intra-jurisdictional cooperation, drills and exercises, and finally writing a plan (see Figure 1). As previously discussed, a preliminary examination of FEMA data on Hazard Mitigation Plan completion has shown that over 90% of the "plan writing" phase of preparedness has occurred at the multi-jurisdictional level, especially within counties and COGs [15]. It would appear that these five activities within preparedness can occur with varying success at different levels of local government. The history of multi-government bodies in emergency management is discussed in the next section.

3.2.2.2. The role of counties and councils of governments

With rare exception, emergency management literature has followed the governmental design of the NGA model to the letter; the four phases are to be carried out at the federal, state, and local level. However, in the NGA report and subsequent literature, local government is seldom defined and assumed to mean primarily city, or occasionally, county government. Very little literature exists on the role of councils of governments in the preparedness phase.

An important note from the literature in emergency management is that "inter-organizational" or "multi-jurisdictional" coordination is considered essential among disaster researchers; even if the terms are broad, encompass many types of coordination, and refer almost exclusively to the response phase of emergency management. Like [14], Louise Comfort argues that due to the increasing complexity of society, not only are effective local responses critical, but are also "necessarily inter-organizational and interdisciplinary" [17]. Comfort had previously proposed specific roles for county emergency management within the preparedness phase. In summary, Comfort lists the county's responsibilities as:

1. Review individual city emergency plans and enter their data into a resource database;

2. Summarize database into county-wide profile of responsibilities and capabilities, and return this report to city governments for review;

3. Conduct drills and exercises that bring multiple organizations together; 4) evaluate the performance of the cities in these drills;

4. improve preparedness at the county level and "seek assistance…from inter-jurisdictional sources;"

5. schedule, monitor and evaluate preparedness activities; and

6. submit an annual report of these activities to the state (adapted from [17]).

Two important factors in Comfort's guidelines are that first, she recognizes the importance of a coordinating government to act between the city and state levels, but she also relies on the assumption that individual cities will author their own plans.

In 1994, William Waugh expanded on Comfort's role for county government. Waugh argued that counties should be the exclusive home of local emergency management, because county offices generally:

1. are geographically close to environmental problems,

2. have larger resource bases than municipalities,

3. have ambiguous administrative structures that encourage inter- and intra-organizational cooperation,

4. are local agents of state administration,

5. have close administrative ties to state agencies,

6. provide forums for local-local cooperation, and

7. serve as general-purpose governments representing local interests and have strong local identification (adapted from [3]).

Waugh's reasoning may provide some insight into why the success rates for Hazard Mitigation Plan authorship are so high for counties and COGs. Yet in many rural areas, counties only encompass a small number of sparsely populated municipalities, which raises the question of when county governments or COGs are more appropriate in the planning process.

Only one example of a successful COG exists in the literature, and it receives a brief mention in a report by Thomas Drabek [18]. In 1990, Drabek published the results of a study of twelve highly successful local emergency managers. From what he learned through personal visits and interviews, Drabek extracted fifteen qualities that all of the managers shared; one of which was the formation of "mergers." While this generally meant the cooperation between public and private organizations, or inter-departmental cooperation, Drabek found that Donald Herrick of Davidson County, South Dakota founded the James Valley Emergency and Disaster Service District- "a four county emergency services unit" [18].

Undoubtedly the academic aspect of emergency management recognizes the usefulness of regionalized government, especially counties and within the response phase of a disaster. In

practice at the local level however, both the preparedness phase of emergency management and the concept of shared governance even at a regional level is resisted and viewed with suspicion and disdain. Despite its apparent benefits, the difficulty in implementing multi-jurisdictional cooperation is discussed next.

3.2.2.3. Cultural issues in local government

Planning for disaster in local government has traditionally been a neglected and misunder-stood part of emergency management. The reasons, summarized and listed in [19], include:

…diversity of hazards, low issue salience, resistance to regulatory efforts, resistance to planning efforts, lack of a strong political constituency, lack of a strong administrative constituency, problems with measuring the effectiveness of programs, the technical complexity of many emergency management efforts, vertical fragmentation of federal systems, horizontal fragmentation of governments and communities, current political and economic milieu, and state and local capacity [19].

In other words, emergency management is not a simple matter. The complex and infrequent nature of disasters compared with more familiar problems places them low on the list of priorities for many planners. This lack of enthusiasm is compounded by local politics, turf protection, and ambiguity caused by shared governance. These reasons for resistance to planning efforts can cause both vertical and horizontal fragmentation of government.

Documenting this type of cultural phenomenon poses a challenge of a sociological nature. Presented below are the results of preliminary studies that have begun quantifying these barriers to success. The results indicate that an aversion to planning is frequently present among local government officials. The reason is twofold: the process itself is ongoing, expensive, and time-consuming, and the background of many professionals in emergency management is one of trained rapid response. By asking city planners to rate their own successes in the formation of mandated local toxic chemical emergency planning committees (LEPCs) under SARA Title III, five years after the policy went into effect in the state of Michigan, M. Lindell [20] found that:

On average, LEPCs had completed 31% of the task of conducting hazard analyses, 26% of the task of developing site-specific emergency plans, and 15% of the task of training emergency responders. Moreover, they rated the quality of their LEPCs work (on a scale of 1-5, 5 is very high quality) at 2.88 for organizing and administering the LEPC, 2.46 for conducting hazard analyses, 2.55 for developing site specific plans, 1.71 for training emergency responders, 2.02 for conducting drills and exercises, and 2.64 for filing hazard data [20].

Lindell's results indicate that not only are planners reluctant to take action, but willingly rank themselves as such. In a follow-up study [21], Lindell found that the largest contribu-

tors to the time commitments needed for plan completion were: committee member input, available planning resources, and community support. Staffing and structure within the government and the city's vulnerability to hazards were not found to be significant (see [21]).

Lindell's findings [20, 21] were supported by two recent papers (see Buckle et al. [22]; and Stuart-Black et al. [23]). Buckle et al. found that the unfamiliar nature of hazards made them less appealing for planners, and that good communication between local government and community led to better planning [22]. The second study [23] surveyed local emergency managers to determine the composition of the field with regard to education, background, age, sex, and previous job experience. The results demonstrated a lack of value placed on education or academic training, with preferences given to practical experience in defense or response-oriented jobs. One of the motivations for the study was what the authors described as an informal "notion…that those doing the job were older men from a military or emergency services background, who having retired from their service were embarking on a second career in order to boost their pensions" [23]. In the United Kingdom, the study found that 76% of local planners looking to hire a new emergency manager were not even considering recent graduates or degree holders [23]. The planners estimated they would fill their positions using employees with significant experience or those looking for a transition into retirement. When asked where they expected to find potential candidates, the planners responded that they "expected to recruit from the local government sector (63%), first response (37%), and/or retired military (34%)," with percentages including responses where multiple sectors were chosen as potential hiring pools. The surveys also asked why these sectors where chosen, and "the overwhelming answer was that age and experience were paramount to the job, and younger applicants were not always able to bring the necessary authority that was needed in dealing with senior officers and elected council members." In regard to this "overwhelming" response, the authors commented that "clearly the emergency planners are by their own actions and beliefs perpetuating the myth." Though the "notion" that prompted surveys in [23] was informal and not fully documented, it certainly is supported by the data collected.

Local emergency managers appear to subscribe to the war-oriented approach described by [1] above. Often police and fire departments closely resemble the military in structure, training, and operation, with all groups placing high emphasis on the ability to act rationally and maintain order in emergency situations. As indicated by [23], this leads directly to hiring preferences that value the experienced responder above all other candidates. It also leads to a second inhibitor to local planning: the difficulties of implementing inter-jurisdictional cooperation.

Policy research has shown that because of differing priorities of various agencies, such as police and fire, "bureaucrats tend to avoid communication with their counterparts in other agencies, even when their responsibilities clearly overlap or interface… In general, the more coordination required to implement a policy, the less chances of its success" (Edwards, 1978, as quoted in [24]). Kartez and Kelley [25] supported this finding with their own survey of local emergency planners. The planners were asked to rank seven strategies for implement-

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ing preparedness policy, based on perceived likelihood of adoption, perceived benefits of strategy, and perceived effort of adoption. Among other strategies, such as citizen education and creating a media information center, inter-jurisdictional forums ranked third and second respectively in benefit and effort, but dropped to fourth for the likelihood of adoption [25]. The authors surmised that the planners recognized the benefit of inter-jurisdictional collaboration, but deemed it too difficult to execute.

Drabek's study [18] of successful emergency managers also supported these conclusions, highlighting the political reasons for avoiding working with other jurisdictions and even departments within their single jurisdiction. Drabek sited "turf defense" as a major barricade to what he called the "sensitive ground" of "coalition building" [18]. Drabek specifically cited an emergency manager that had tried to start a smoke detector and fire extinguisher campaign in his jurisdiction, much to the irritation of the fire department, who felt such a campaign was their responsibility and resented the emergency manager for making them look unconcerned about prevention.

3.2.3. Summary of planning for disaster in federal, state, and local government

The previous sections provided a history of the planning subsection of the preparedness phase of emergency management. Planning at the federal level is limited; federal government is primarily a financier and supporting partner of response, recovery, and mitigation efforts. The most recent federal policy, the Disaster Mitigation Act of 2000 and FEMA's subsequent Interim Final Rule (44 CFR Parts 201 and 206) have required that all local jurisdictions have an approved Hazard Mitigation Plan in order to be eligible for any federal funding opportunities.

The states play intermediate roles in transferring information between local and federal governments, and the local governments are responsible for their own planning. Using the five aspects of preparedness [4, 16], Table 2 shows how some roles within the Preparedness phase can be checked off by definition, while others remain poorly understood. To carry out any of the activities listed at the regional level, without the knowledge or cooperation of the city level, would be extremely poor planning. Similarly, inter- and intra-jurisdictional cooperation requires the participation of multiple jurisdictions by definition. The remaining roles however, are poorly understood within the literature. For instance, what is the role of a council of governments in drills and exercises? Are they activities that require maximum cooperation, or are counties better suited to perform this task so as to avoid over-complication? This chapter focused on planning at the city, county, and COG level (Table 2) but certainly more research is needed in the other areas of the Preparedness phase.

COG	?	?	?	+	?
County	?	?	?	+	?
City	+	+	+	+	+
	Plan	TA	RAA	IJC	D&E

Table 2. The Roles of Local Government within the Preparedness Phase

Although placing responsibility for planning at the local level is logical, considering locals know their areas the best and are the first to respond to a disaster, literature shows that in practice there are many more factors at play. First, writing a plan on paper is only a small portion of preparedness as a whole. Second, the individual government success rate for Hazard Mitigation Plans is minute compared to that for multi-jurisdictional bodies; even though the latter is not well understood in the literature. Finally, a political, response-based culture at the local level has consistently made multi-jurisdictional cooperation difficult.

Returning to planning and preparedness within the context of a national emergency management system, recall that emergency management follows a four-phase model developed in 1979 by the National Governor's Association. The four phases are: preparedness, response, recovery, and mitigation. They are accepted as standard among practitioners of emergency management, and are widely considered to be overlapping and cyclical (Figure 1). All four phases contain component activities as demonstrated in the literature (Table 1). Due to the complexity of actual disasters, it is likely that even more activities and sub-categories exist within these divisions, but they have yet to be formally established by the literature.

As defined by the NGA model, the four phases of emergency management can be extended to all levels of government (Figure 2). A typical assumption in emergency management literature is that government in the United States is divided into local, state, and federal levels. However local government can be further subdivided into municipality/town, county, and COG. The activities that comprise the four phases of emergency management may be carried out at all levels of government.
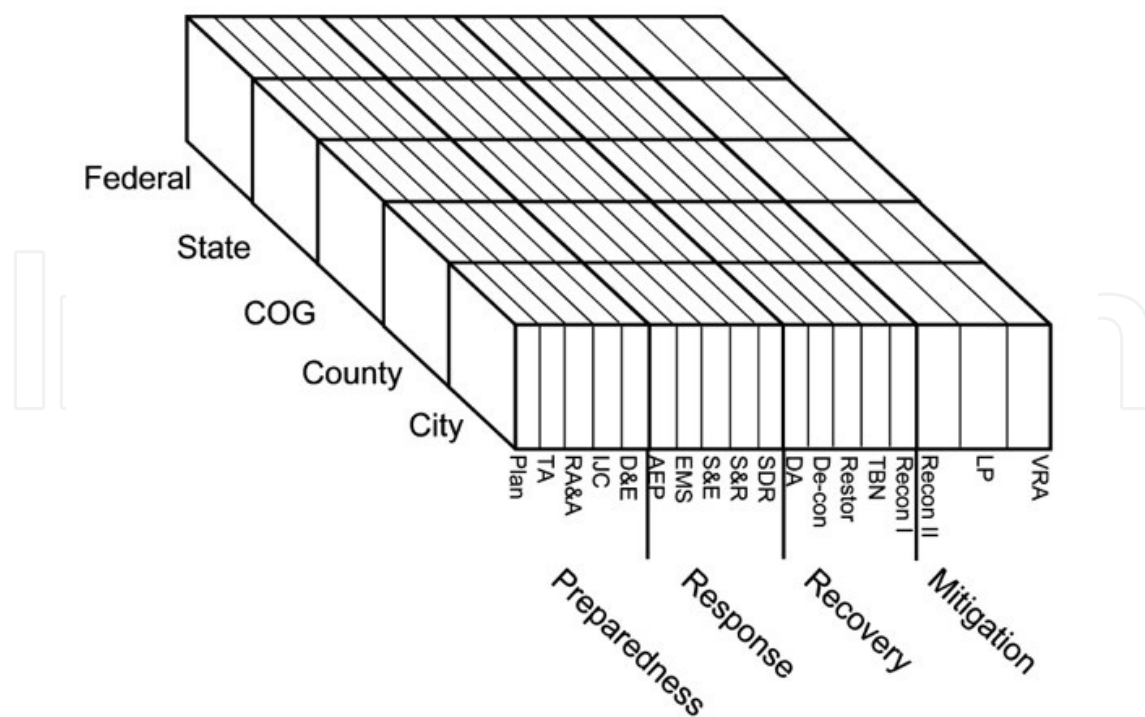

Figure 2. Four phases of emergency management at all levels of government

However a third dimension may be added to the model to show what aspects of emergency management can influence the activities within certain areas of government. Three factors were found to have a significant effect on organizing emergency management activities within a government by [21] as discussed earlier: available resources, committee input, and community support. It is likely that there are many more factors that influence preparedness and cooperation in local emergency planning, but these have yet to be documented in the literature. In addition to influencing emergency management activities, these three factors also provide frameworks for measuring the activities. A pictorial representation (Figure 3) provides a visual summary of the Four Phase Model, extended to all levels of government, and within the contexts for action identified by [21], and clearly shows the complexity faced by local planners.
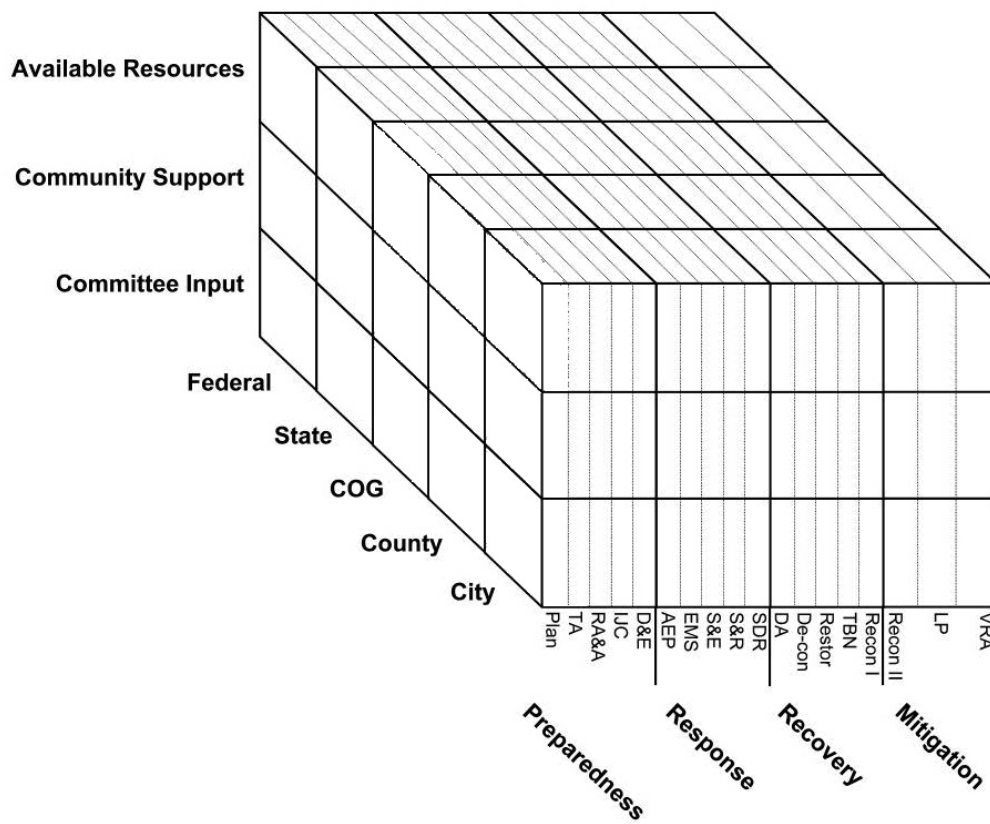

Figure 3. A Conceptual Model of the National Emergency Management System. Copyright © 2008 Andrea M. Jackman & Mario G. Beruvides

3.3. Hazard mitigation planning as part of a national emergency management system

Most of the emergency management literature in this chapter is presented within the context of planning, specifically for hazard mitigation in a local community. However based on Table 1, the findings of [21], and the established structure of American government, it is not

unreasonable to begin imagining the complexity of our national emergency management system as illustrated in Figure 3. Certainly there is more research to be done; more activities may be added to the subdivisions of the Four Phase Model as our national approach to emergency management grows and evolves, and further motivating factors for each activity will likely be discovered beyond those in [21] that were found to influence planning.

However one aspect of Figure 3 cannot be disputed: the complexity of our national emergency management system will not get any simpler. Even the introductory overview of literature provided in this chapter is able to justify an 18 x 5 x 3 conceptual diagram – equaling a minimum of 270 individual components that make up the national system of emergency management. Recalling the words of sociologist Arjen Boin from earlier:

First, Western societies become increasingly dependent on complex systems to deliver most basic tasks ranging from garbage collection to national defense. Second, the various subsystems become increasingly tightly coupled, which means that a disturbance in one system rapidly propagates toward another [14].

Hazard mitigation planning is a small component of emergency management. Even expanded to all possible levels of government, it is only one type of plan among many, and planning is only one type of activity in overall preparedness. Yet one might question, how "tightly coupled" is it with other aspects of emergency management? How rapidly will one action within a HMP propagate to other subsystems within emergency management as a whole? A simple HMP may be comprised of a community risk assessment and one or two mitigative actions to reduce those risks. But the risk assessment is likely based on past disasters in the community. The lessons learned and recommended actions from those disasters in turn influence future responses, which influence future recovery efforts, which will drive mitigation planning and risk assessments in later years. Through Figure 3 we see how one activity affects many others within the system. At first glance, local hazard mitigation planning seems distant and unrelated to decontamination efforts managed by the federal government. However an effective mitigation strategy put in to place today through the HMP process may significantly reduce the need for decontamination or any federal involvement at all. As another example, the after-action report of a state-level search and rescue team could directly impact risk assessments, planning, and mitigation strategy following a major disaster.

Hazard mitigation planning at the local and COG level, studied from all possible planning contexts, only comprises (at most) 9 out of 270 subsections of Figure 3, or 3%. This estimate does not include the further breakdown of different kinds of plans in addition to HMPs, yet was shown to influence many other subsections of Figure 3. This illustrates not only the importance of understanding hazard mitigation plans, but the impact of *any legislative action* taken in emergency management. The true impact of a single act can have vast, sometimes unpredictable consequences, especially in a system such as emergency management where current practices and scientific research are still relatively

new. An understanding of the implementation of the HMGP policy is critical for this reason, and is discussed in the next section.

4. Hazard mitigation planning in the 21st century

The HMGP policy that led to HMPs as a requirement was put into place in November, 2004. Based on the material covered in the previous sections, two questions naturally arise: first, how many local jurisdictions have completed HMPs since the original deadline? Second, for those localities with an approved HMP, how did they manage given all the documented cultural aversions to planning at the local level?

These questions were answered in part by a recent series of studies [15, 26]. An initial study [15] found that in 2008, 67% of the country's active local governments were without an approved Hazard Mitigation Plan (Figure 4).
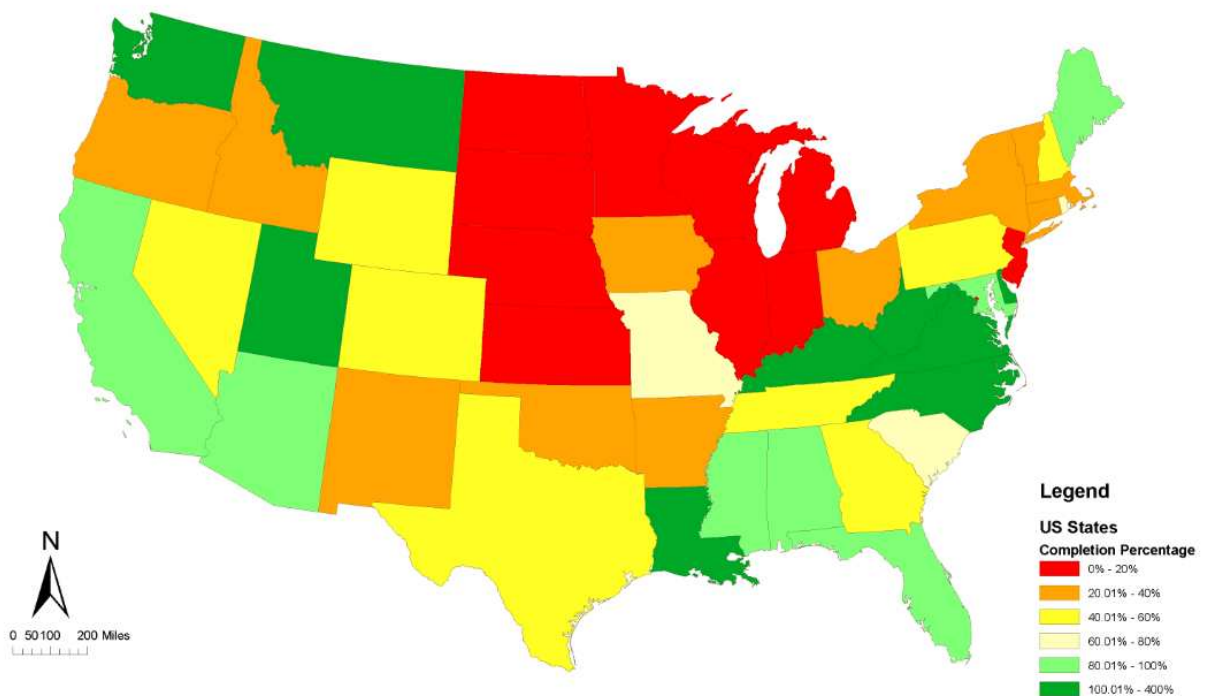

Figure 4. Map of Hazard Mitigation Plan Completion Percentage for the Continental United States in 2008 [15]

A follow up examination in 2009 [15] of the eight states with the lowest completion percentages did not indicate significant improvement following the initial study, and revealed inconsistencies in plan completion data over time. The completion percentage varied greatly by state, and did not appear to follow any expected pattern such as wealth or hazard vulnerability that might encourage prompt completion of a plan. Further, the results indicated that

approximately 92% of the approved plans were completed by multi-jurisdictional entities, which suggests single governments seldom complete and gain approval for plans. This is directly opposed to expectations set by literature documenting cultural barriers to multi-jurisdictional collaboration, and presents a number of opportunities for further research.

The study was conducted for the initial three year period of the HMGP from 2004 to 2007, and given the results, it is important to note that federal policy such as the HMP requirements can change quickly and often. Strategic directions, policy, and guidance can change regularly, and is always expected at the federal level following a change in administration. The completion percentages demonstrated in this study represent an important step in understanding how long it takes for jurisdictions to react to policy changes and take necessary steps to become compliant, especially given the systemic complexity demonstrated in Figure 3.

A second study [26] examined HMP completion within the context of "available resources" from Figure 3; namely, cost. It was found that the cost of a HMP varied significantly based on the frequency of natural hazards experienced by the authoring jurisdiction, the number of participating jurisdictions in the plan, population, and population density. Similarly, multi-jurisdictional plans were found to be significantly cheaper unless a jurisdiction experienced, on average, more than 6.5 events requiring some kind of emergency response per year (see [26]). This would provide a financial incentive for jurisdictions to override some of the cultural barriers mentioned earlier, and proceed with a multi-jurisdictional plan. In view of the realities presented thus far and the sheer complexity of the US emergency management system, future research might benefit from a systems analysis and systems dynamic modeling to assist in shaping our national emergency management policy.

Where will hazard mitigation planning go from here? The importance of having at least some level of understanding of the possible impacts of any new emergency management policy were illustrated by Figure 3, and this section demonstrates that for the example of hazard mitigation planning, relatively little is known about its implementation, success, and longevity. Planning in general was shown by the literature to be valued by policymakers and theorists, but difficult to execute in practice for a variety of reasons. Due to the far-reaching consequences of good mitigation and mitigation planning, continued research in this area is critical to a better understanding of our entire national emergency management system.

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