COORDINATION OR CONTROL:
ORGANIZATIONAL DESIGN AND THE EMERGENCY MANAGEMENT FUNCTION

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The issue of how to manage natural hazards and disasters effectively is, unfortunately, one that seldom concerns governments and communities until the immediacy of events requires action to avoid or lessen the loss of lives and property. Indeed, the public policy literature takes it as a fundamental truism that crisis very frequently is the only means of getting even critical issues on the public agenda and getting government officials to recognize and respond to them. Crisis provides the "policy window" necessary to encourage action by policymakers. Certainly that dilemma is no less true for the management of natural hazards and preparation for potential for catastrophic disasters, as evidenced by the pattern of disaster legislation in the United States (May, 1985). Notwithstanding that problem, emergency management is becoming a more permanent and visible function of governments at all levels, given impetus by both recent catastrophic events and the increasing political costs and legal liability to public officials as a result of ineffective action.

As will become apparent from the analysis to follow, the topic is the broad function of emergency management, rather than crisis management alone. Consequently, the administrative concerns are certainly broader in scope and duration than the need for effective disaster managers and response agencies. It is also being suggested that the topic of disaster management has tended to dominate the discussion of emergency management and, thus, to inhibit the development of new structures for managing natural hazards and disasters.

The question to be addressed here concerns the organizational dimensions of emergency management and, more specifically, the importance of organizational factors in the design, implementation, and maintenance of emergency management programs. The final issue is how to provide an effective structure for that function. The analysis is preliminary in the sense that it lays the foundation for a study of the effects of organizational factors on both disaster responses and the broader emergency management function from the viewpoint of experienced local government emergency managers. Indeed, the literatures based in practical experience and theoretical insights suggest that much more effective emergency management organizations can be designed and implemented. This paper is a preliminary examination of those issues - but not an argument for a single, "best way" of managing hazards and disasters. While there is no presumption that there is a "best" way of organizing emergency management, it is assumed that some ways are better than others and that appropriate structures may be

defined to encourage the pursuit of those "better" ways. To the extent possible, the examination will include the dilemmas and opportunities for effective emergency management programs in developed and developing nations, within unitary and federal systems of government, and within a variety of agency types, as well as in a variety of political and organizational cultures.

Emergency Management and Government Structure

The organization of many, if not most, public programs raises fundamental questions concerning the need to find an appropriate level of government to assume responsibility. Political jurisdiction, the locus of technical expertise, financial resources, and other concerns normally determine the officials and agencies that assume ultimate responsibility. Within federal systems, it has been argued that regional and local officials face a number of major obstacles, including the very diversity of the hazards faced, the low salience of emergency management as a political issue, resistance to planning and regulatory (particularly land-use regulation) efforts, the lack of strong administrative and political constituencies for emergency management, problems measuring program effectiveness (except in the aftermath of a disaster), the technical complexity of many emergency management issues, the vertical and horizontal fragmentation of the intergovernment system complicating action, current and continuing fiscal limitations, and the questionable capacities of regional and local governments (Waugh, 1990a). At issue, most frequently, is whether regional and local officials have the political wherewithal, fiscal resources, and administrative capabilities to identify hazards, assess risk, design appropriate policies, and implement and maintain effective programs. While the same questions may be raised concerning central government officials, the issues are fundamental.

The issues are complex in federal systems when jurisdictional boundaries dictate and frequently confuse governmental responsibilities and diffused authority complicates leadership and in unitary systems when the lack of adequate regional discretion slows communication and inhibits coordination. On one hand, there is the administrative issue of centralizing or decentralizing the emergency management function. Centralization, presumably, assures adequate fiscal, technical, administrative, and political capacities to address complex emergency management problems; and decentralization assures adequate flexibility, shorter logistical and communication lines, and greater potential for targeting responses where they are most needed or addressing the particular problems raised by a natural hazard. Certainly, there are attendant issues of governmental capacity, particularly at the regional and local levels but at the national level as well. The common wisdom may be that effective responses require action at all levels of government

(United Nations, 1984). Thus, the administrative imperative is to sort out responsibilities in a way that will encourage effective interaction and cooperation.

However, as Llewellyn M. Toulmin, Charles J. Givans, and Deborah L. Steel (1989) suggest, there are problems in disaster communications associated with the "intergovernmental distance" between the involved government agencies. That is, the communication process will be made much more complex, even confused, by differences in agency procedures, missions, cultures, and a variety of other organizational characteristics. While Toulmin, Givans, and Steel principally address the potential for problems in the communication process during disaster responses, much the same can be said of communication in other administrative operations, such as planning, financial management, and the development of cooperative relations, although the problems would likely be less severe without the time pressure of a disaster. At the system level, the most difficult problems attributable to "intergovernmental distance" may be the mission-related conflicts, such as those between national security agencies and scientific agencies and between civil defense-oriented programs and natural hazard-oriented programs.

The picture that is drawn is that of a very complex and even confused system of responsibilities and capabilities. To illustrate some of the problems that might arise in an emergency, we can examine the response to Hurricane Hugo in South Carolina in the fall of 1989. One of the major criticisms of the Federal Emergency Management Agency (FEMA) following the Hurricane Hugo and Loma Prieta earthquake disasters was the agency's failure to take a lead role in the response phase of the disaster operation. FEMA, instead, insisted that it's responsibility was to provide support for state and local agencies, the first responders and the responsible jurisdictions in the U.S. federal system. As a result, FEMA waited for officials, more specifically the governor, in South Carolina to request federal assistance rather than assuming a more proactive role in responding to Hurricane Hugo's destruction. South Carolina officials, on the other hand, were having to deal with the confusion arising from the state emergency management agency being housed in the adjutant general's office rather than in the governor's office and the failure of the former to have adequate communication with local emergency management agencies in the path of the storm. Quite apart from the issues of administrative and technical capacity in state and local emergency management agencies, the political and organizational confusion that became apparent in South Carolina demonstrated the need for more attention to how the emergency management function is structured - where it is housed in the government, how the agencies are empowered (the definition of their roles and responsibilities), and the design of the agencies themselves. To a large extent, those issues have found expression in the questions raised by emergency managers themselves concerning whether their agencies should be directive or coordinative.

That distinction is frequently the first element in an agency's mission statement. In the case of the slow response to Hurricane Hugo, FEMA officials did in fact express the view that FEMA's mission was to be a coordinating and support agency, rather than a direct response agency, and it was simply awaiting an official request for assistance from the responsible state officials.

On the other hand, there are the issues of programmatic and management flexibility. In other words, the farther the decision maker is from the problem to be addressed, the less likely that the problem will be perceived accurately and that resources will be allocated effectively. That is particularly true when improvisation is needed to address unanticipated demands or consequences (Kreps, 1991). The operational flexibility issue is manifest in Enrico Quarantelli's assessment (1984) of organization problems during disasters. He finds that while internal organizational control is seldom lost during disaster responses, there do tend to be major problems with the internal and external communication processes. Communicating through the chain of command is made more complex by the additional actors, assumption of new tasks by officials, and the need to assume new, often unanticipated tasks. Externally, new communication links often need to be established and maintained, organizations assume new roles during emergencies (thus reordering their relationships), meaningful and accurate emergency information has to be communicated to the public, information needs to be gathered from the public and communicated to appropriate agencies, and so on. Demands for new information in response to nonroutine problems must be met. Communication with a fragmented set of agencies, what May (1985) called "horizontal" and "vertical" fragmentation of the intergovernment system, must also be encouraged and maintained. Indeed, the most often cited problems during the Hurricane Hugo and Loma Prieta earthquake disasters were related to communication. Communication (i.e., mostly satellite-based communication) and access were among the most cited problems in the international response to the recent Armenian earthquake. Quarantelli also concludes that problems frequently center on the exercise of authority resulting from weak authority structures, stress on emergency personnel, organizational "turf" conflicts, and jurisdictional overlap and conflict. Lastly, Quarantelli cited the problem of coordination, especially the lack of consensus on the need for and nature of coordination, conflicts over new tasks, and increased pressure when events overwhelm plans and resources. He goes on to warn of the dangers of relying too heavily on experience, what the military calls "fighting the last war" rather than the next one.

Notwithstanding those observations concerning the barriers to effective emergency management, particularly at the regional and local levels, it is not expected that local agencies will be overwhelmed during even a major disaster. While external support and resources are frequently needed, the presumption that local authorities cannot handle events is

not necessarily accurate. In fact, a danger in centralizing emergency management decisionmaking during a disaster is that it will disrupt the local "first response" (United Nations, 1984). Local agencies are more capable and resilient when events demand than is generally expected.

That being the case, at what level should operational decisionmaking take place? At what level and in what kinds of organziations should fiscal and technical responsibility lie? There are no answers to those questions for all states, because political, fiscal, administrative, and scientific/technical capacities vary and, indeed, are uneven within each state. But, there may be important lessons that can help officials answer those questions for their own communities.

Organizational Design and Agency Structure

The assumption is that there are fundamental differences between agencies whose role is to coordinate the activities of a variety of other disaster response and support agencies and those agencies whose role is to control or direct the disaster response. The organizational design literature does suggest that the technology (i.e., how an agency operates) affects the structure of the organization, as well as its willingness to assume risk, capability to act cooperatively, resource base, and perceived clientele, and so on.

Very generally, the suggestion is that agencies with stable task environments and rather routine tasks will tend to organize as classic, Weberian bureaucracies. That military-like organization is characterized as having a clear hierarchy of command, formal communications, divisions of labor, task specialization, and so on. Communication is typically top-down. The degree of specialiation among the organization's components is generally related to its size (i.e., its resource base). Police and fire departments generally follow that model. By contrast, so-called "professional bureaucracies," such as scientific organizations and social agencies, tend to be much more structurally fluid, with less attention to hierarchy and formal communications (Heffron, 1989). As Charles Perrow has suggested, an organization dealing with nonroutine technologies (i.e., many exceptions to the norm and less easily analyzable problems) would most likely develop "an organic, flexible structure" and craft organizations (i.e., few exceptions and less easily analyzable problems) would most likely develop a "decentralized structure with lower formalization and more discretion vested in employees..." (Heffron, 1989: 121) (Perrow, 1970) Matrix organizations (Heffron, 1989) problems of coordination and tendencies toward "turf wars" as evidently occurred within NASA.

In those terms, one would expect emergency management agencies dealing with the routine management of natural hazards to be more formal and hierarchical with the level of centralization in decisionmaking related to the uniqueness of

the hazard. By contrast, emergency management agencies dealing with ambiguous and dynamic hazards or with developing crises would be expected to develop more flexible, less formal structures with decentralized decisionmaking. Given that crisis management tends to foster centralized decisionmaking and hierarchical, command-oriented structures, there would seem to be inherent problems in terms of operational flexibility and the targeting of resources. The reality of disaster response is one in which great uncertainty and conditions of urgency exist and agencies must be adaptable and pragmatic, even balancing their own autonomy and the need for coordination (United Nations, 1984).

While the technology-structure connection is uncertain, it is assumed that highly structured, formal organizations have considerable difficulty with nonroutine problems. Moreover, such highly structured organizations may tend to "bend" problems to fit their technologies. For example, FEMA's Integrated Emergency Management System (IEMS), which focuses on generic emergency management functions, may be viewed as a method of routinizing technologies. IEMS may, in fact, conserve resources by encouraging all-hazards approaches, but it can also produce inappropriate responses as dissimilar hazards are treated similarly and the stiffling of innovation and creativity as routine supplants singular action. Those difficulties are likely to increase with the distance between the IEMS administration and the hazards being addressed. As the literature suggests (see, e.g., Gortner, Mahler, and Nicholson, 1987), while functional departmentalization is managerially efficient and may even improve morale as people with like technical specialties are grouped together, coordination and integration may become major problems.

If the technology defines the organization's jobs, job qualifications, ability to reach goals, and structure, as the literature suggests (Heffron, 1989), that part of the emergency management function that requires great flexibility may necessitate the development of an "adhocracy."

One analysis of government reorganization efforts, indeed, suggests that the best strategies are to base structure on the functions to be performed, fit agency structure to its purpose, group related programs, recognize that good people cannot overcome bad structure, provide the administrative head with broad discretionary authority, permit broad spans of control, decentralize operational decision making authority, delegate authority to comprehensive regional directors when service delivery coordination demands, and avoid attempting coordination functions through a collective such as an interagency committee (Dean, 1981: 150). In short, decisionmaking discretion should be permitted at the lowest level practicable or necessary.

Given those recommendations, there are a number of questions that might be raised about the FEMA structure in terms of the predominance (or at least great influence) of the national security orientation, the conflicts among vastly

differing programs, and the accountability to a large number of Congressional committees.

Emergency Management and Organizational Culture

While not strictly an issue of organizational design, the importance of organizational culture cannot be overlooked. As J. Steven Ott has concluded: "The organizational culture perspective totally rejects the basic assumptions, precepts, and tools of classical organization theory" (1989: 147). That is, the organizational culture view is contrary to the idea underlying both classical organizational theory and so-called "modern" structural organization theory, with its emphasis on economically efficient structures, that there is "one best way" of organizing work. Building upon the behavioral theories of the past half century, organizational culture theorists suggest that the values, norms, customs, and circumstances affect both the organization's imperative to act and its choice of actions.

The organizational culture perspective is also related to the power or political competition view of organizations. That view suggests that organizational goals are a product of a bargaining process among contending elites and, as suggested by the culture proponents, the people (individually and collectively) within the decisionmaking process. In essence, an emergency management decisionmaking process would generally be characterized by organizational and individual biases in problem definition (Dery, 1984; Waugh, 1990b) and risk assessment (Jasanoff, 1986), as well as in the political and administrative processes of program implementation and administration. For example, the debate over the cancer-causing qualities of man-made chemicals has been characterized by disagreement among experts and the confusion of laypersons (Jasanoff, 1986).

This analysis is on shakier ground in suggesting that decisionmakers in classic bureaucratic organizations, to the extent that the people and the organizations are more authoritarian and conservative and less tolerant of ambiguity, tend to exhibit more "extreme judgments," (Souief, 1958) "premature closure," and "a need for certainty" (Bochner, 1965; Budner, 1962). In other words, the authoritarian decisionmaker will tend to take more extreme actions, force resolution to problems, and show intolerance for ambiguous circumstances (Wright, 1984). Moreover, some people and organizational cultures are more risk-averse than others (Jasanoff, 1986). Given the implicit (and infrequently explicit) valuations of human life on which government programs may be based, the internalized values of the decisionmakers and those values embedded in the organizational culture, therefore, are important considerations in the determination of what kind of organization should be given responsibility for acting.

Studies of terrorism, for example, have suggested that the responsible agency defines the problem. National security

agencies tend to view terrorism, in most of its manifestations, as a national security problem. By contrast, law enforcement agencies tend to define terrorism in their legal own terms. The effect of those differences is that for national security officials the unit of analysis is nations, hence individual hostages or victims are of less importance than national concerns, and for law enforcement agencies the unit of analysis is individuals (terrorists and victims) and political considerations hold less sway in the decisionmaking process (Waugh, 1990b). What is suggested here is that organizational goals are explicit or implicit in the definition of the problems to be addressed and how the problems are structured for solving. Also, organizational momentum (or inertia) develops through the commitment to a problem definition, the structure of its resolution and the routinization of tasks. In essence, that is the incrementalist view of policymaking.

The importance of an agency's value system or what Selznick (1957) called its "organization character" to its decisionmaking finds considerable support in the emergency management literature. The differences between scientific and regulatory agencies, particularly regarding the issues of agency responsibility and credibility, were noted by Ralph H. Turner, Joanne M. Nigg, and Denise Heller Paz in their study of the early Palmdale earthquake predictions (1986). The Brady-Spence earthquake prediction in Peru during the late 1970s raised a number of issues concerning the translation of scientific knowledge into public policy and the credibility problems that might result from an unfulfilled prediction (Podesto and Olson, 1988). Criticisms of the New Madrid prediction in 1990 that resulted in a significant expenditure of public resources and, perhaps, considerable fear among the some of the populace frequently focused on the credibility issue and the difficulty that officials, the media, and the public had in understanding the debate among scientists. To the extent that credibility is critical to effective action, especially when evacuation may be necessary (Perry, 1985: 70-71), the design of the emergency management function should facilitate the translation and application of scientific information, recognizing the conflicting advice that may be provided.

Similar individual and organizational conflicts are evident in the interaction among the U.S. government's hazard/disaster agencies, particularly between scientific agencies (like the U.S. Geological Survey and the National Oceanic and Atmospheric Administration) and civil defense or national security agencies (like the National Security Council which has been given broad lead authority for emergency management in national emergencies). Coordination is difficult within agencies with programs of differing characters - like FEMA which has experienced conflicts among regulatory-oriented programs (like the National Flood Insurance Program), training-oriented programs (like the National Fire Academy), and civil defense-oriented programs

(which ostensibly were the principal reasons for the creation of FEMA). Notwithstanding those conflicts or potential conflicts, the development of relatively strong intergovernmental and intragovernmental emergency management networks, while reducing "intergovernmental distance" (Toulmin, Givans, and Steel, 1989) and perhaps facilitating communication and coordination, may simply impose an inappropriate set of values on the more subordinate agencies. Frequent interaction and dependence, particularly of fiscal dependence, encourages subordinate agencies to mimic the superior in terms of mission statements, job titles, and other artifacts (as the organizational culturists would call them).

Also, in the South Carolina case, the state response to Hurricane Hugo was made more complicated, to say the least, because emergency management was not a principal emphasis for the response agency, i.e., it was only a secondary mission for the Adjutant General's Office and one that competed for resources with the military mission. In that regard, the South Carolina case is even more illustrative of the problem of determining where to house an emergency management agency and what impact that decision will have on the operation of programs to manage hazards and disasters.

The organizational culture literature (see, e.g., Ott, 1989: 184-87) may also provide explanation for some of the conflict between civil defense-related emergency management agencies and more disaster-oriented ones in terms of the importance of symbols as an expression of organizational values. An oft-cited image, usually of derision, in the American emergency management community is that of the air raid warden's of the 1950s and 1960s which evolved into the civil defense wardens or directors of later years. The prevalence of civil defense-related position titles and organizational designations, particularly in local agencies, is in conflict with the broader emergency management perspective. Visible attention to the International Decade for Natural Hazard Reduction in speeches and writings, for example, supports that new view of the field.

Organizational Design and the Effective Emergency Manager

In studying effective emergency managers, Drabek (1987) suggested five themes and fifteen strategies for increasing local agency effectiveness. In brief, the themes were to (1) assure that the mission of the agency is consonant with public perceptions concerning priorities; (2) find a supportive niche within the local government; (3) demonstrate organizational capability; (4) increase interorganizational linkages; and (5) engage in constituent-building activities. The fifteen strategies are designed to achieve those broad objectives. Drabek's conclusions are that the most effective emergency managers are those that have achieved those objectives.

Elsewhere in the literature, it has been suggested that success is related to agency and individual disaster experience (Turner, Nigg, and Paz, 1984; Scanlon, 1990; Kreps,

1991), personal linkages among involved agencies (Scanlon, 1990; Kreps, 1991), size and location of the jurisdiction (Drabek, 1987), nature and location of the hazard or disaster (Waugh, 1990a; Scanlon, 1990), and the saliency of the issue prior to the disaster (Cigler, 1988; Waugh, 1988).

In terms of the structure of local emergency management in the United States, according to a recent International City Management Association (ICMA) study (Kreps, 1991), emergency planning is being done by a variety of local officials - city managers (23 percent), part-time emergency preparedness coordinators (19 percent), full-time preparedness coordinators (14 percent), and fire chiefs (16.2 percent). County planning was done by full-time emergency preparedness coordinators (44 percent) and part-time coordinators (33 percent). In short, the larger the city or county, the greater the likelihood that there will be a specific unit with emergency preparedness responsibilities (p. 46), as opposed to emergency preparedness being a secondary function of another agency such as a fire department. That bears out the suggested impact of agency or jurisdictional size on the level of specialization (or differentiation). That listing also indicates that emergency management, if reflected accurately in the job titles, is viewed as a coordinative function in most cities and counties. Indeed, a coordination-orientation is more likely in American counties because county government is somewhat less likely to have clearly defined chief executive officer, thus a more ambiguous chain of political and administrative command (Kreps, 1991: 47).

Conclusion: Is There an Effective Emergency Management Organization?

In large measure this has been a preliminary ramble through the organizational design literature and some suggested areas in which theory might inform practice. The basic issue is one of balancing the needs for authority, responsibility, and expertise - i.e., placing the emergency management function at one or more levels of government to assure that authority and responsibility for its elements are clearly assigned and expertise is brought to bear. In management terms, such tasks are common to public and private sector organizations. The political and scientific contexts complicate the tasks of emergency management considerably, however.

One of the difficulties is separating out the crisis management functions from emergency management, not because they are not a part of emergency management but because the administrative imperatives during crises are somewhat different. As indicated by the prior studies of emergency management, the ambiguous situation and the conditions of urgency require greater adaptability and coordination of effort. Despite the tendencies to centralize authority and control during such times, theory would suggest more organic, less hierarchical and formal, structures are more adaptable and more responsive to unusual and unanticipated demands.

Indeed, Paul t'Hart, Uriel Rosenthal, and Alexnder Kouzmin (n.d.) have suggested that the conditions of crisis management do not require centralized decisionmaking. The time advantage realized through the efficiency of centralized decisionmaking may in fact be lost due to the time-consuming bureaucratic process. The pathologies of individual and small group decisionmaking also raise questions concerning the quality of the decisions. And, as 't Hart, Rosenthal, and Kouzmin point out, when centralization means central government involvement other variables are introduced into the decisionmaking process. Time perspectives and attention to peripheral issues differ at the operational and strategic levels.

To the extent that planning and evaluation processes are being integrated into the response and early postresponse phases of disaster response and clearly are integral to the preparedness function, more centralized decisionmaking and resource allocation would be suggested. Operational decisionmaking, however, should remain at the lowest level at which information is sufficient to make such decisions.

The question of routinization is not easily answered. The literature generally suggests that routinization is a process that occurs naturally as organizations learn to deal with nonroutine demands - as they turn uncertainty into certainty. Standard operating procedures simply become more complex to accommodate the new demands. It is still difficult to address unique problems with routine procedures, however. Moreover, the tendencies for "faulty analogizing" and incrementalism may be critical flaws in an emergency management system. Richard E. Neustadt and Ernest R. May suggest a process of policy review to lessen the likelihood of "faulty analogizing" to assure that dissimilar circumstances are not treated similarly (1986). Incrementalism may be inherent in decisionmaking process, but may be lessened by increased sensitivity to the policy and decision predispositions of the involved agencies. As Dean (1981) suggested for governmental reorganizations, packaging like programs together in agencies - such as regulatory programs, natural hazard-related technical programs, or emergency response programs - will lessen conflict arising from value and "character" differences. The agencies responsible for coordinating emergency response units and agencies, then, can develop genuinely cooperative and coordinative processes rather than having to act as a regulator in one context, a coordinator in another, and a disaster relief agency in another - as FEMA has to do. In that way there would also be less confusion over responsibilities prior to, during and after disasters and in the management of natural hazards.

If the management literature of the day is to be believed, the development of professional bureaucracies in the involved agencies will also lead to less hierarchical and less control-oriented organizations. Authority will be based on technical expertise rather than institutional rank and decisionmaking will be more collegial, more geared to consensus-building. Military-style command structures will be

both inappropriate given the professional nature of the employees, but in many respects dysfunctional.

The most appropriate approach for identifying an effective organizational structure for emergency management may well be a so-called self-designing agency (Korten, 1980; Gornter, Mahler, and Nicholson, 1987). Rather than attempt a top-down imposition of structure on a function, the necessary procedures should be put into place and then let the structure form around the procedures. The objective is to develop an appropriate and adaptable structure that can learn from its mistakes and make adjustments to both its procedures and its structure.

What does all this mean for emergency management? To the extent that the policy design and implementation processes permit a focus on procedures, e.g., developing land-use regulation processes that assure adequate attention to hazard mitigation, rather than structures like agencies, a self-designing organization may be feasible. FEMA's origins suggest that that will not be feasible in all cases. Better opportunities exist in the development of emergency management agencies at the regional and local levels where the unit is frequently placed in or near the chief executive's or chief administrator's office. In the U.S., for example, city and county charters frequently permit great latitude in the structuring of deputy mayor, assistant city or county manager, executive assistant, and similar support positions. As coordination of local efforts with regional and national authorities is a central concern during disasters, as well as within many of the more routine intergovernmental relations, such an arrangement would be logical and adaptable to the preferences of the chief executive or administrative office. Proximity to the head of government is frequently mentioned as a major concern of emergency managers. That might also facilitate decisionmaking and decision support and organizational learning.

The conflict between routinization and flexibility suggests the need for two types of agencies, for coordination and response or crisis management. The routine nature of most emergency management functions supports the notion of the lead agency being a coordinative one.

The underlying question here is: what kind of emergency management policy do we want to have? That also raises the attendant question of how much risk we willing to accept, leading to the questions of how to measure risk, how to communicate it credibly, and how to translate information on that risk into effective policies and programs to reduce hazards and disasters? Can self-designing structures emerge to serve as vehicles for those objectives? And, in terms of the requisite foundation of values to support those efforts, can the responsible agencies be empowered and envigorated to motivate the efforts?

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