SOCIO-ECONOMIC ASPECTS OF HAZARD MITIGATION

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INTRODUCTION

Disaster mitigation measures consist of "policies and actions taken before an event which are intended to minimize the extent of damage when an event does occur" (Drabek, Mushkatel, and Kilijanek, 1983: 12). Such measures include land-use regulations enacted to control development and settlement patterns; decisions about where to locate particular facilities and projects; the application of design and engineering principles (e.g., through building codes) that are intended to make new structures more resistant; the retrofitting of existing structures to reduce future damage; measures taken to protect the contents of structures from damage and to protect building inhabitants; public works (e.g., dams, shoreline maintenance projects) undertaken to reduce disaster impact; and other policies and activities enacted beforehand to minimize the life-safety hazards, damage, and social disruption resulting from disasters.[1] Disaster mitigation efforts are developed and implemented at various levels: entire societies or multiple societies; regional areas within countries; cities, villages, and other local communities; organizations; and households.

Mitigation is usually distinguished conceptually from disaster preparedness planning in that mitigation typically involves

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[1] Hazard insurance is sometimes considered a type of mitigation strategy. Although strictly speaking insurance merely spreads losses within a pool of policyholders, insurance can also reduce losses if it encourages the adoption of mitigation measures, e.g., through rate-setting.

relatively long-term efforts to reduce disaster vulnerability and aims at lessening disaster impact and severity, rather than enhancing the capacity to respond to an event when it occurs. Although the concept is used most often to refer to actions taken with respect to future events, in practice mitigation measures are often only considered after a disaster strikes, to contain losses should the event recur.

Of the four disaster phases, mitigation and recovery have been studied the least by social scientists; considerably less is known about these phases than about disaster preparedness and response. However, both mitigation and recovery have received increased attention in recent years, and there is a growing literature on mitigation from which some insights can be drawn. This paper first presents a general overview of research on hazard mitigation--which unfortunately consists mainly of studies conducted in the U. S. It then attempts to develop a framework for thinking about mitigation as a social process, rather than (as is too often the case) as the application of technical solutions to reduce losses.

U. S. RESEARCH ON HAZARD MITIGATION

The research conducted on hazard mitigation in the United States can be divided roughly into three main areas (see Tierney, 1989 for a more detailed discussion):

1. Studies on how various mitigation measures are developed, adopted, and implemented. Studies in this category address the factors that encourage or discourage the adoption of hazard mitigation measures at the societal and community levels. Research

in this area includes studies on the adoption of various earthquake hazard reduction measures at the state and community levels (Drabek, Mushkatel, and Kilijanek, 1983; Wyner and Mann, 1983; Wyner, 1984; Olson, 1985; Alesch and Petak, 1986; Berke, Beatley, and Wilhite, 1989); and on flood plain land-use regulations and the National Flood Insurance Program (Hutton, et al., 1979; Frey, 1983). Some of the work in this area focuses specifically on decision-making with respect to the adoption of hazard mitigation measures in communities that recently experienced a damaging disaster (see, for example, Mader, et al., 1980).

2. Studies on risk perception, attitudes, and behavior with respect to various mitigation programs and practices. Overlapping to some degree with the first category discussed, these studies focus on attitudes toward mitigation within the general public or among influential segments of the population, such as elected and appointed officials, as well as on the factors associated with taking mitigative actions. Representative studies in this area include work by Rossi, Wright, and Weber-Burdin (1982) and Mittler (1989) on how public officials perceive and assess various approaches to mitigating hazards; research on how members of the public perceive the earthquake hazard and what measures they take to reduce earthquake losses (Turner, Nigg, and Paz, 1986; Mileti, Farhar, and Fitzpatrick, 1990); studies on the factors influencing the adoption by households of strategies to protect against volcanic hazards (Perry and Lindell, 1989); and studies on decision-making with respect to the purchase of hazard insurance

(Kunreuther, et al., 1978; Palm and Hodgson, 1992).

3. Studies on the impact of mitigation measures. Mitigation measures may or may not achieve their objectives, and they can have intended and unintended consequences. Some research attempts to assess loss reduction measures and determine the extent to which programs achieve the desired effects when they are implemented. Examples include work on the impacts of earthquake-related land-use measures in California (Palm, 1981); special earthquake safety ordinances for older buildings (Tyler and Gregory, 1990); the National Flood Insurance program (Burby and French, 1980; Cigler, Stiftel, and Burby, 1987); and flood plain land-use policies (Burby, et al., 1988).

This listing of projects and topic areas is not meant to be comprehensive, but rather to provide a general idea of the kinds of studies U. S. social scientists have conducted on hazard mitigation. Much useful knowledge has been developed as a result of this work, and some conclusions can be drawn. First, the literature has shown rather conclusively that objective risk, perceived risk and mitigation efforts are at best loosely coupled. At the individual level, community residents may know they are at risk from a particular hazard, but fail to take necessary protective steps, because they lack the financial capability, because they do not understand the various mitigative options that are available to them, or because it doesn't make good economic

sense for them to do so.[2] At the community level, promoting mitigation is difficult even in situations where hazards are acknowledged. Where risks are not well understood, or where risk levels are perceived as moderate rather than severe, program adoption is even more difficult.

Second, the literature suggests that the current sociopolitical environment is not favorable toward hazard mitigation. In the U. S., many actions that can be taken to enhance hazard mitigation (e.g., land-use decisions, the adoption and enforcement of building codes) are the responsibility of the local governmental level. Local "policy environments" vary across the U. S., but for the most part the institutional and intergovernmental system works to discourage hazard mitigation (Nigg, 1991). With certain notable exceptions,[3] mitigation is not addressed directly through national legislation, and decisions about how far to go in implementing mitigation programs are left primarily to state and local governments. One consequence of this

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[2] With respect to the last point, for example, homeowners in California are given the option of purchasing earthquake insurance, but the premiums and the deductibles are so high that for many people insurance doesn't appear to be a worthwhile form of protection, given the level of risk. Earthquake insurance is such a "bad buy" for the average homeowner that many people who might benefit from it don't take advantage of it.

[3] The National Flood Insurance Program and the Coastal Zone Management Act are examples of Federal government initiatives directed at hazard mitigation. A Federal earthquake insurance law that in its current form attempts to provide incentives for mitigation is currently being considered by Congress. Additionally, a Presidential Executive Order issued in 1990 mandates that seismic design and construction requirements be applied to new buildings constructed or leased by the Federal government.

pattern is that some states and communities have good programs in place to mitigate some hazards, while others have done little or nothing.

Approximately two years ago, the U. S. Congress requested the preparation of a report on the topic of earthquake hazard mitigation and the reasons why mitigation has been so difficult to achieve. Among the most prominent impediments to mitigation identified in the report were: insufficient leadership and direction from the Federal government level; the low priority given to the earthquake hazard by many state and local governments and by the general public; and the absence of clear financial incentives that would make earthquake hazard mitigation more feasible. The general conclusion of the report was that unless the Federal government makes certain mitigative actions mandatory, they are highly unlikely to be undertaken by sub-Federal levels of government or by the private sector (Federal Emergency Management Agency, 1992). While this report focused only on the earthquake hazard, these findings can certainly be generalized to other hazards.

A third point emphasized in the literature is that both disaster events and "champions" or "policy entrepreneurs" play an important role in promoting mitigation. Mitigation is normally difficult to promote; efforts to do so must overcome both organized opposition and institutional inertia. Disaster events sometimes provide "windows of opportunity" that allow for the adoption of mitigation measures (Alesch and Petak, 1986). Disaster damage can

make the need for mitigation dramatically apparent. Disasters may also mobilize groups not previously aware of or concerned about a hazard to press for mitigation, while temporarily neutralizing opponents.[4] Additionally, disaster experience can make opponents aware of legal or political liabilities they face by resisting mitigation.

Unfortunately, however, disaster experience can have perverse as well as productive effects. Sociologists note that repeated experience with a particular disaster agent (e.g., seasonal flooding) can also result in the development of "disaster subcultures," in which households and communities learn to adapt to and live with the hazard (Weller and Wenger, 1973). They develop typical ways of responding when disaster strikes, but at the same time they may become so accustomed to experiencing particular disaster agents that they don't consider mitigating the hazard.

Even when a highly dramatic disaster event highlights the need for mitigation, hazard reduction is not likely to occur without the involvement of organized interests that "champion" mitigation. These groups mobilize support, help overcome opposition, do the technical work necessary to establish a basis for mitigation, draft legislation, design programs, and in general keep the idea of mitigation alive over time. The "champion" or "policy entrepreneur" role is often assumed by members of professional

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[4] Even distant disasters can do this. For example, the 1985 Mexico City earthquake helped generate support and weaken opposition for both statewide and municipal earthquake hazard mitigation measures in California.

groups (e.g., engineering societies, associations of building officials), scientists, and elected and appointed public officials.

GENERALIZING FROM RESEARCH ON MITIGATION

The literature has certain limitations, however. Studies have tended to focus on single mitigation strategies or policies, such as seismic building ordinances or flood plain management programs. And although there are a number of exceptions, much of the work focuses on particular community settings or states. Such an approach is very helpful for those who wish to obtain detailed information on individual cases. However, it also has drawbacks. Because of its focus, the literature lacks a broader theoretical orientation that would make it possible to think about the mitigation process and related activities in a more general sense. The literature, in other words, tends to look very specifically at the conditions affecting the adoption, implementation, and impact of single measures in specific settings, but does not go on to generalize about the mitigation process itself. Using previous research and other sources as background, I will next attempt to provide that more abstract or general context.

A Sociological Approach to Understanding Mitigation

We can improve our understanding of the hazard mitigation process by starting with two basic assumptions: that both risk itself and the opportunity to mitigate are socially structured; and that mitigation is essentially a social activity--specifically an attempt at planned social change. These two points are discussed briefly below.