Natural Hazard Research

A POLITICAL ECONOMY APPROACH TO HAZARDS: A CASE STUDY OF CALIFORNIA LENDERS AND THE EARTHQUAKE THREAT

Sallie A. Marston
Department of Geography
University of Colorado

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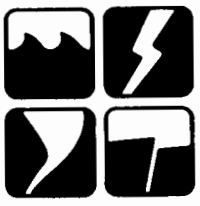

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SUMMARY

This paper utilizes a political economy perspective in studying natural hazards, expanding the definition of vulnerability to include the interaction of people, hazards, and social structures. From this point of view, disasters are not simply "natural" but are also the result of endemic conditions in a particular social setting, and hazards research seeks to identify those processes and structures in society which affect hazard vulnerability. The paper begins with a description of a specific relationship within American society--the federal government and mortgage lenders--and argues that the emerging interrelationship of the two may be contributing to the problem of disaster vulnerability in California. A case study of California lending institutions and their attitudes toward the earthquake hazard supports this thesis.

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PREFACE

This paper is one in a series on research in progress in the field of human adjustments to natural hazards. It is intended that these papers be used as working documents by those directly involved in hazard research, as well as inform a larger circle of interested persons. The series was started with funds from the National Science Foundation to the University of Colorado and Clark University, but it is now on a self-supporting basis. Authorship of the papers is not necessarily confined to those working at these institutions.

Further information about the research program is available from the following:

Gilbert F. White
Institute of Behavioral Science #6
University of Colorado
Boulder, Colorado 80309

Robert W. Kates
Graduate School of Geography
Clark University
Worcester, Massachusetts 01610

Ian Burton
Institute for Environmental Studies
University of Toronto
Toronto, Canada M5S 1A4

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INTRODUCTION

It has become increasingly important, in trying to understand human disaster vulnerability, to recognize that rational decisions with respect to natural hazards occur in a social/economic/political context, and further that the relationship among individuals, hazards and society is mutually interactive. Indeed, one can look at social structure as an important determinant of disaster vulnerability.

This paper examines institutional attitudes and behavior toward the earthquake hazard in California and attempts to link those attitudes and behavior to wider political and economic forces. The paper demonstrates that research using such a political economy approach provides a framework for understanding individual behavior with respect to hazards. In this study, lending institutions, when viewed in this wider context, make seemingly rational decisions regarding their behavior towards the earthquake hazard. However, these California mortgage lenders are largely free to ignore the earthquake threat only because potential governmental relief exists should an earthquake occur. The government, by providing disaster relief in the past, has reduced certain constraints on the lenders' present behavior.

A scenario might proceed like this: In California, a real estate agent is selling a house which, because it was built before 1933, is exempt from specific building code requirements.* A buyer, informed by

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*The Riley Act of 1933 and subsequent Health and Safety codes set minimum earthquake construction safety standards that apply to buildings built after 1933.

the real estate agent that the house is in a Special Studies Zone,* nevertheless decides to purchase the house. The lending institution that will be providing the loan on the house receives a report from its own appraisal department noting the geologic conditions of the property and the construction of the dwelling. Nevertheless, the lender provides a mortgage for the borrower with requirements for neither structural reinforcements nor earthquake insurance.

In this example, each of the parties seemingly acts rationally. Initially, the real estate agent, as required by law, informs the buyer of the Special Studies Zone location. However, the real estate agent is but an intermediate actor in the house selling process, and she or he has no other vested interest in the property except in selling the property at the highest possible price. Next, the buyer, informed of the potential risk, still purchases the house because she/he plans to live in the house only a short time; or because she/he feels that earthquakes do not pose a direct threat to the property; or because she/he feels that the government, in the event of a major damaging earthquake, will provide financial relief. Finally, the lender may recognize the earthquake as a real threat, but refuse to add more cost to an already expensive morgage--and thus risk losing the loan--by requiring earthquake insurance. Although each of the participants in the scenario appears to act in a rational way, the earthquake hazard has, unfortunately, not disappeared.

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*The Special Studies Zone Act requires that specially designated areas throughout California be mapped and described by the state geologist as active or potentially active earthquake fault zones. An amendment to the act requires that the real estate agent or seller of a home disclose to the homebuyer the fact that the house is located within one of these mapped areas.

One obvious problem for the "rational" buyer described above is that government relief in the form of loans may not be forthcoming following an actual earthquake. Indeed, there is much confusion about who is ultimately responsible for the mitigation of disaster in our society. One might think that in a society where the rights of the individual are paramount, individual responsibility would also be paramount. Yet, a general belief seems to exist that government should be held responsible for mitigating so-called "acts of God."

In fact, in the past the federal government has conducted disaster mitigation in many forms--from land-use planning to direct relief loans. However, disaster relief policies at the national level can change with each new administration (or more often) and aid proffered in the past may not be readily available in the future. Thus, the magnitude of disaster vulnerability changes over time as policies and economic conditions change.

The Political Economy Perspective

As the scenario and its analysis indicate, in contrast to the traditional approach to natural hazards described below, if one uses a political economy perspective in assessing risk, one must not only take into account individuals and hazards, but also social structure--particularly political and economic institutions in society that influence human behavior. Political economy recognizes that government, in its laws and practices, and economic forces such as profit motive and market competition, are important influences on rational behavior, and moreover, that these two forces are strongly related.

To take an obvious example, in capitalist societies, each individual capitalist seeks to maximize his/her profit and, in doing so,

competes with the efforts of others to accrue capital. Thus, the need to remain competitive may blind individual capitalists to certain risks--including environmental hazards.

The human ecology/bounded rationality model is the traditional approach to understanding hazard risk perception. In reviewing that model, it is possible to identify how political economy is able to strengthen some of its weaknesses. Human ecology recognizes that the natural world is a set of inter-related systems in a state of dynamic equilibrium. Bounded rationality, loosely based on Simon's (1957) theories of decision-making, enables one to understand how the dynamic equilibrium of the human/natural system may be upset. Specifically, it describes how human beings "satisfice,"* with potentially disastrous consequences. Kates describes the conjunction of human ecology with bounded rationality, and views natural disasters as:

> . . . an interaction of man [sic] and nature, governed by the coexistent state of adjustment in the human use system and the state of nature in the natural events system (1970, p. 1).

Further on he continues:

> Variation in the perception of a specific natural hazard (expectation of future occurrence and of personal vulnerability) can be accounted for by a combination of: the way in which characteristics of the natural event are perceived, the nature of personal encounters with hazards, and the factors of individual personality (1970, p. 25).

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*In "satisficing" an individual attempts to attain a certain minimum standard of performance because there are too many unknowns to attain a maximum. Thus, instead of maximizing, the individual satisfices by setting his/her aspiration level at the boundary between unsatisfactory and satisfactory. Satisficing is usually employed to describe the behavior of a firm under uncertain economic conditions, but can also describe individual behavior under uncertain environmental conditions.

According to this description, it would seem that within the human ecology/bounded rationality model, maladaptive behavior with respect to hazards is derived, at least partially, from mistaken perception, imperfect knowledge or inflexible decision-making. However, Kates himself points out that "many of the real determinants of human behavior related to natural hazards lie outside the interface of the natural systems and the human systems model" (1970, p. 25). In addition, in Environment As Hazard, a volume discussing the concepts, models and philosophy of the traditional approach, the authors indicate that "social variables have been neglected both as being crucial to hazards reduction, and as constituting causes of disaster loss" (Burton, Kates and White, 1978, p. 214). Throughout the volume the authors point to factors such as the prevailing political system and level of economic well-being of a given population as influences on its vulnerability.

The key difference between the traditional approach and the political economy approach is that what is implicit in the former is theoretically and empirically explicit in the latter. Whereas the traditional approach suggests that social variables are important, political economy specifically attempts to define and analyze those social variables, such as economic system and governmental organization, which influence vulnerability. The political economy approach not only recognizes the importance of these variables but also, and more importantly, examines just how they operate. Thus, the political economy approach attempts to expand the traditional model of human ecology/bounded rationality, and, more importantly, attempts to make a significant contribution towards elucidating some of the real determinants of disaster vulnerability.

With that task in mind, this paper is divided into two main sections. The first is a discussion of the role of the federal government in natural disaster mitigation, with specific attention paid to disaster loans. Much of this first section relies upon Kunreuther's research on federal insurance and disaster recovery (1973, 1974, 1978).* The second section is a discussion of a case study of lenders' attitudes toward the earthquake hazard in California, and is an attempt to support the arguments put forth in the Introduction. These discussions are followed by a Conclusion which includes some suggestions for future applications of the theoretical arguments put forth in this paper.

THE FEDERAL GOVERNMENT AND DISASTER LOANS

The role of the federal government in the relief of natural disasters in the United States has evolved through history. Federal financial relief following the 1906 San Francisco earthquake was practically insignificant.

> Rebuilt at a cost of $350 million, the new San Francisco was basically self-financed. About 5 percent of the funds came from fire insurance, 1 percent from relief funds from public subscription, and the remainder from private capital. The governmental contribution was at most 1 percent (Haas, Kates and Bowden, 1977, p. 6).

In contrast, following the 1971 earthquake in San Fernando, through direct grants and loans the federal government provided almost 60 percent of the $500 million in relief.

The very different roles assumed by the federal government in response to the 1906 and 1971 disasters are not surprising when one considers their respective historical settings and the popular attitudes

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*See also Dacy and Kunreuther, 1969; Mileti, 1975; Cochrane, 1975.

toward government at the time of each disaster. In 1906, the federal government was only just beginning to take a more participatory role in private economic affairs. However, a laissez-faire attitude by the government and populace still held considerable sway. At present, the government and the economy are very tightly enmeshed, and many hazards researchers agree that the provision of disaster loans is now considered a governmental responsibility. Indeed, the government provided more than $7 billion at favorable terms in disaster loans during the period 1953-1977 (Norton, 1979).

Before 1933 and the creation of the Reconstruction Finance Corporation (RFC), federal disaster loans were made outside of any special agency, on an ad hoc basis in response to individual disasters. The RFC was the first public agency authorized to provide loans for the purpose of financing repair or reconstruction of property damaged or destroyed by earthquake, fire, tornado, cyclone or flood. For 20 years the RFC was the lead agency in disbursing disaster loans. Between March, 1933 and September, 1953 the RFC and its affiliate, the Disaster Loan Corporation, granted loans totalling $68.8 million (Kunreuther, 1973).

In 1953, as the RFC was in its final liquidation phase, the Small Business Administration (SBA) was created and assumed the role of providing disaster relief aid to the private sector in the form of grants and loans. The main purpose of the SBA disaster loan is to "restore a victim's home or business property as nearly as possible to its predisaster condition" (Small Business Administration, 1968--as cited by Kunreuther, 1973). Tables 1 and 2 demonstrate how, since 1965, the federal government has had an increasingly benevolent attitude toward

TABLE 1

ANNUAL FEDERAL DISASTER AID, FISCAL YEARS 1953-73
($ in millions)

Fiscal Year	President's Disaster Fund	SBA Disaster Loans	FHA Disaster Loans	Total
1953	8.1	--	44.1	52.2
1954	1.7	1.1	94.1	96.9
1955	14.5	8.2	89.1	111.8
1956	15.5	47.3	87.0	149.8
1957	15.6	14.8	66.7	97.1
1958	13.3	15.8	63.4	92.5
1959	8.4	4.4	39.8	52.6
1960	4.5	13.3	22.9	40.7
1961	13.0	16.9	26.5	56.4
1962	30.2	41.8	63.3	135.3
1963	33.8	22.4	62.5	118.7
1964	47.2	162.7	50.1	260.0
1965	86.2	72.7	78.4	237.3
1966	133.6	138.9	102.1	374.6
1967	22.0	10.6	95.8	128.4
1968	45.4	114.7	108.9	269.0
1969	29.2	17.2	115.6	162.0
1970	181.0	209.1	93.9	484.0
1971	145.7	422.7	132.6	701.0
1972	99.3	125.7	110.9	335.9
1973	474.4	1,523.7	565.2	2,563.3

(President's Disaster Fund: Federal Disaster Assistance Administration, Reports and Evaluations; SBA disaster loans: Small Business Administration, Office of Reports; FHA disaster loans: Farmers Home Administration--as cited by Kunreuther, 1973)

TABLE 2

SBA LOAN AMOUNT AND FORGIVENESS AMOUNT FOR
TEN MAJOR DISASTERS BY TYPE OF LOAN, 1965-1972

($ in millions)

Disaster	Home		Business	
	Total Loan	Forgiveness	Total Loan	Forgiveness
1965-1970				
Hurricane Betsy	92.0	37.2	37.0	2.8
Hurricane Beulah	15.6	6.9	12.5	1.7
Hurricane Camille	98.9	21.1	62.7	2.0
Lubbock Tornado	6.7	1.9	12.0	0.5
Hurricane Celia	115.2	35.6	48.5	2.8
1971-1972				
San Fernando Earthquake	212.8	156.0	43.7	8.9
Hurricane Doria	47.4	39.8	9.2	2.2
Hurricane Fern	35.2	27.1	1.9	0.8
Rapid City Flood	33.6	14.4	31.8	4.7
Tropical Storm Agnes	674.7	452.0	537.1	91.8

(Small Business Administration, Office of Reports--as cited by Kunreuther, 1973)

disaster relief. It is important to note the large increases for disasters occurring in the 1971-1972 period. Kunreuther points out that this had to do not with an increase in disasters, but with the liberalization of the forgiveness clause in the SBA loan policy (1973). He cites evidence from a Los Angeles Times study of SBA loans following the San Fernando earthquake indicating that:

> . . . under the forgiveness clause in effect at the time an individual could borrow $3,000, but had to repay only $500. . . . The Los Angeles Times survey revealed that homeowners were given funds to repair damage not caused by the earthquake, did their own work even though loans were based on a contractor doing it, and frequently received more money than they needed for repairs (1973, p. 21).

Kunreuther contends that the federal government's response to the failure of homeowners to insure against hazards is a disincentive to protect against future damage. Homeowners believe that the federal government will always bail them out.*

It would seem from this case study that lenders are of a similar opinion. In fact, a closer look at just a few of the over 30 programs sponsored by the federal government to provide direct relief loans illustrates an interesting point. Table 3 lists some of the federal programs that currently provide financial relief to the housing sector. Superficially, it appears that these programs are strictly for the

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*The SBA (and its disaster loan policy) has gone through various alterations since the fraudulent activity following the San Fernando earthquake. However, it still provides loans at well below market rates and at very favorable terms.

By 1976, Congress had determined that disaster loans should carry an interest rate based on a formula derived from the adjusted annual interest rate for all U.S. obligations (Norton, 1979). Yet, in the Small Business Act Amendments of 1977, Congress dropped the interest rate to 1% on an amount loaned below $10,000 and 3% on an amount between $10,000 and $40,000 for loans to repair or replace a primary residence.

TABLE 3

SOME FEDERAL PROGRAMS FOR NATURAL DISASTER RECOVERY OF THE HOUSING SECTOR

Federal Programs	Provisions
Department of Housing and Urban Development--Adjustment to Federal Loans	Provides adjustments of loan payments by refinancing any loan made by HUD secured by private property that is subsequently damaged or destroyed by a major disaster.
Veterans' Administration--Adjustment to Federal Loans	Provides assistance whenever a residential property which secures a loan guaranteed, made, or acquired by the VA is damaged or destroyed by a major disaster.
Farmers' Home Administration--Low to Moderate Income Housing	Assists farm owners and other homeowners in rural areas to repair or replace dwellings and related facilities damaged or destroyed by natural disaster.
Department of Housing and Urban Development--Mobile Home Loan Insurance	Provides reasonable financing of mobile home purchases to disaster victims.
Department of Housing and Urban Development--Mortgage Insurance to Disaster Victims	Provides guaranteed/insured loans to finance the purchase of single family housing for the occupant/mortgagor who is a victim of a major disaster.
Small Business Administration--Physical Disaster Loans	Provides low interest loans to restore the homes and businesses of victims of natural disasters to pre-disaster conditions.

(National Governors' Association, 1978; Academy of Contemporary Problems, 1978)

benefit of the unfortunate homeowners who become the victims of natural disasters. No doubt these programs do benefit the victim. With the help of a loan from the Department of Housing and Urban Development, the Farmer's Home Administration, or the Small Business Administration, a disaster victim could restore her/his damaged property to pre-disaster condition. Yet the very special nature of housing as a commodity complicates this seemingly simplified aid structure.

This is apparent when one considers the financing of housing. Of monthly housing expenses, including the mortgage payment itself, one quarter goes for utilities, maintenance, repairs and overhead, one quarter goes to property taxes, with the remaining half representing profit and/or equity for the investors in the property--the owner and the lender (U.S. President's Commission on Urban Housing, 1969, p. 39). Because of government support of mortgage lenders, the typical mortgage has an amortization period of 20 to 40 years with the borrowed amount usually being 70 to 90% of the purchase price of the home (Unger and Melicher, 1978). During the initial years of ownership, nearly all of a house payment goes directly to the lender as payment of interest. For the entire loan repayment period, total interest payments are generally much greater than the principle itself (Stone, 1973). Indeed, residential mortgage debt is a large component of national (and state and local) economy. Residential mortages outstanding at the end of 1980 were worth $1,095 billion for the nation as a whole. They represented the primary form of credit in the U.S. and exceeded the federal debt by over $50 billion in 1980 (U.S. League of Savings Associations, 1980, p. 24). It is no surprise then that mortgage lenders rely on the continued benevolence of the federal government in times of disaster, and

avoid the high cost of insuring their large portfolios against earthquake losses. Moreover, as indicated in Table 3, direct financial relief in the form of loans and grants enables the homeowner not only to make necessary residential repairs, but also allows her/him to refinance below current market rates, though not necessarily below the disaster victim's previous market rate.

> This has a desirable effect--not only does it allow a disaster victim to reduce an otherwise larger financial burden, but it also provides for a flow of funds into the area lenders. That is, the lenders are the recipients of the funds provided by the refinancing, which allows them to continue lending at the time of a disaster, often at higher interest rates than on the original loans (Kaplan, Smith & Associates, 1981, p. 54).

Clearly, the mortgage lenders profit greatly from this arrangement.

Because the government continues to provide direct loans and grants, lenders in California continue to ignore the potential for economic loss from earthquakes. It is not clear, however, that there is a simple cause and effect link between the provision of disaster loans and obliviousness to vulnerability. Lenders for the most part ignore the threat from earthquakes not because they are caused to do so--specifically told or shown that they need not worry--but because the unquestioned expectation of continued government relief aid allows them to ignore that threat.

CALIFORNIA LENDERS AND THE EARTHQUAKE HAZARD

The economic response to the earthquake threat in California is an ideal case study for several reasons. First, California is the locus of most of the earthquake activity in the U.S. Second, because California has both extensive property development and higher than average property values, more property there is at risk from earthquakes than anywhere

else in the U.S. Third, there is a great deal of related research and literature on the earthquake hazard in California. Fourth, California far outranks every other state in its volume of outstanding mortgage loans and loans sold on the secondary market (Kaplan, Smith & Associates, 1981).

Study Design*

The study consisted of interviews with officers of the 12 largest home mortgage lenders in California. The sample was established by surveying the total dollar amount of residential loans held by California institutions. Table 4 represents those figures for the 12 institutions surveyed.

The discussion of survey responses given below is divided into three subsections: the mortgage lender/federal government relationship and its effect on disaster vulnerability; competition in the mortgage market; and ideological constraints on hazard perception. The interrelationship of these factors is also discussed.

Survey Results

Generally, the results of the survey indicate that there has been no industry-wide adoption of earthquake hazard insurance and that the presence of potential federal aid has encouraged that neglect.** However, before examining specific subsections of the survey it might be

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*For a more complete discussion, see Marston (1982).

**In a larger study conducted recently by Palm et al. (1983) many of the preliminary findings of this study were confirmed. For instance, out of 90 California home mortgage lenders interviewed, representing almost 75% of the dollar value of residential mortgages held in 1982 in California, only six institutions had some kind of enforced earthquake hazard policy. The policies ranged from simply informing the borrower of existing hazardous geologic conditions to refusing to lend on or modifying loan conditions for structures in a Special Studies Zone.

TABLE 4

TOP TWELVE RESIDENTIAL LENDERS
CALIFORNIA 1980-1981

Lenders	Residential Loans
Bank of America	$13,736,000,000
Home Savings and Loan Association	11,203,000,577
Great Western Savings and Loan Association	8,661,256,000
Wells Fargo Bank	5,701,273,000
Security Pacific Bank	4,235,000,000
Gibraltar Savings and Loan Association	3,757,387,686
World Savings and Loan Association	3,512,886,969
Imperial Savings and Loan Association	3,308,822,080
Allstate Savings and Loan Association	2,589,267,708
Fidelity Savings and Loan Association	2,588,578,094
Citizens Savings and Loan Assocation	2,489,278,263
Crocker National Bank	2,431,500,000
Combined assets in real estate loans	$72,593,702,000

(This table is based on annual reports for the commercial banks, and on reports from the California Department of Savings and Loan for the savings and loan associations.)

useful to examine the attitudes of the lenders toward the earthquake hazard.

Responses to the first question, "Does this institution use information on earthquake or landslide hazard as a basis for appraising the value of property?" indicate that more than half of the lenders interviewed did use geological information in their appraisal practices. Seven respondents stated that their institutions had a hazard policy, and five stated they did not. Of the seven lenders who did use geologic information, two used only information about landslides and ignored the earthquake threat entirely. Of the five lenders using earthquake information, only two had formal policies, and only the first of these actually enforced a limited policy of refusing to make loans on commercial property in the San Francisco Bay area astride the San Andreas Fault. Because this policy had been in effect only since 1977, there were many loans in the institution's portfolio that were uninsured. Furthermore, the narrow perception of unacceptable risk, i.e. "astride the San Andreas fault line," ignored other high risk conditions such as loose, unconsolidated soils, hillside locations, or simple proximity to the fault line. Moreover, the rest of California as well as residential real estate on the fault line was exempt from the policy.

The second lender that had a formal policy did have a two-page statement in its Appraiser's Standard Procedures Manual (in effect since 1972) which required that the appraiser indicate on the appraisal form that earthquake insurance is mandatory when a residential structure is built of concrete, brick or adobe, or when a wood-frame dwelling exceeds three stories. The policy also stated that earthquake insurance would be waived if the buyer is <u>able</u> to self-insure. However, nowhere did the

policy state that the buyer is required to insure. The chief appraiser at this institution stated that the policy was routinely waived and that rarely if ever had an appraiser indicated the need for earthquake insurance. The assistant vice-president in charge of real estate loans at this same institution stated, "As you know, we haven't yet come to grips with the earthquake situation in this industry."

Of the five lenders who stated that they had an earthquake hazard policy, four indicated that they had seldom, if ever, refused to grant a loan on the basis of the earthquake threat. All five stated that rarely had they required earthquake insurance, and in all five cases the appraiser was unlikely to devalue property with a potential for earthquake damage or to require structural mitigation measures. Ultimately, the lenders' hazard awareness was not translated into enforced policies for 11 of the 12 lenders interviewed.

There may be several explanations for this indifference. Perhaps the lenders believe that the government is responsible for mitigating disaster. Perhaps the competition in the mortgage market precludes taking the risk into consideration. Perhaps they believe that the dwellings they mortgage are structurally sound and will not sustain significant damage in an earthquake, or that their residential mortgage portfolio is sufficiently geographically diversified that the risk is not great.

Mortgage lending and federal solicitude. To understand what lenders believe to be the role of government in disaster mitigation, the representatives of each institution were asked several questions. First, they were asked whether they were familiar with the federal disaster loan program for homeowners. Because Marin County in northern

California was declared a disaster area following the mudslides and flooding of January, 1982, many of the lenders interviewed indicated recent first-hand experience with the Small Business Administration's Disaster Loan Program. Eleven of the 12 stated that they were aware of the federal loan programs and would recommend them, if available, to borrowers in the event of an earthquake disaster. All 12 respondents believed that the disaster relief programs were likely to continue at some governmental level. Eleven respondents said that it was either a federal or a state responsibility to provide disaster loan assistance to homeowners who suffer property damage, and only one indicated unequivocally that he felt it was "the homeowner's responsibility to take care of disaster and damage from disaster." The same respondent was in favor of dismantling the federal disaster loan program. Of the other 11, nine opposed dismantling the loan program, one was unsure, and one favored a federally subsidized insurance scheme for earthquakes similar to the National Flood Insurance Program.

Competition and earthquake risk. In order to understand the effect of competition in the mortgage market on lenders' decisions, those respondents who had no policy regarding the earthquake hazard were asked why they did not require earthquake insurance. (Of course, earthquake insurance is not the only means of reducing risk. There are other practices such as land use control and building code implementation that could also be used. However, earthquake insurance requirement was used as a measure because lenders are generally familiar with insurance as a risk reduction device, having used mortgage insurance to reduce the risk of mortgage default.)

Of the five lenders with no expressed policy, three indicated that requiring earthquake insurance would reduce their competitive advantage, one stated that it would be a disservice to the borrower, and the other stated that it was unnecessary because the "federal government will step in in the event of a major damaging earthquake." When the same five lending representatives were asked the drawbacks of mandatory earthquake insurance, four indicatd that it would be too expensive and/or would reduce competitiveness, and the other stated that earthquake insurance policies were undependable.

Although the need to remain competitive was not an obstacle to risk reduction for all lenders, clearly several lenders perceived it as a problem. In fact, asked their reaction to mandatory earthquake insurance, two respondents who had a "policy" indicated that they would be unhappy if earthquake insurance were federally required because it would make their lending institutions less competitive. It is difficult to understand how an across the board policy of earthquake insurance would diminish any single lender's competitive advantage, since the requirement would apply equally. Perhaps some lenders feel their lending activity is concentrated in relatively high hazard areas and would therefore have proportionately more borrowers deterred by mandatory expenses. Perhaps some have a simple distaste for federal intervention in lending matters; indeed, there was a great deal of negative comment about the National Flood Insurance Program.

Earthquake hazard perception. To find out whether the lack of an earthquake hazard policy was simply based on an underestimation of the actual threat, the lending representatives were asked two questions. To the first question, "Do you feel that the geologists' predictions of a

major damaging earthquake ocurring in California in the near future are exagerrated?" five responded yes, five no, and two felt unqualified to answer the question.

The second question, directed at the officials' own expertise, elicited very different responses. When asked, "Do you feel that damages resulting from a major earthquake would incur substantial financial losses for you as a lender? and why?" nine out of twelve felt that losses would be substantial. The only lender with a formal, enforced earthquake hazard policy stated, ". . .it would be impossible to escape that kind of damage especially because we are a major California bank with loans all over the state. . . ." These responses strongly suggest that the lenders recognize the reality and implications of the earthquake hazard.

Discussion

Clearly, one factor that contributes to disaster vulnerability in California is the existence of federal disaster loans. In the past, federal disaster loans have been provided consistently and generously. Moreover, financial institutions have relied on federal aid in times other than after disasters--for example, during economic downturns and crises.

Because the financial and political systems are now so enmeshed, it is not surprising that the government intervenes following disasters. The provision of federal aid undeniably serves the collective need, but it does so by directly benefiting mortgage lenders.

Miliband (1969) contends that because of their inherent power--both political and economic--financial interests are often able to pressure government to conform to their needs. Whether because this power is

explicitly exerted on the government or whether the government simply responds automatically to an economic and political partner, the federal government does provide disaster loans in a way that directly benefits lending institutions.

However, it must be emphasized that the provision of federal disaster loans may not continue. Under a different administration, the federal government might discontinue the provision of direct disaster loans, forcing private companies to insure residences against earthquake damage so that individuals will not have to absorb the losses themselves. One reason we now have socially determined "natural" disasters is that the government has "socialized" the cost of disaster relief. Conversely, if the government ceased disaster aid, capital would have to be more thoughtfully invested with respect to earthquake faults, landslide zones, flood plains, etc. Clearly, in a society where responsibility is not spelled out and does change, disaster vulnerability is actually a product of ever adjusting and readjusting systems.

It is easy to argue that government provision of disaster loans is the root cause of disaster vulnerability, but other factors contribute as well. For instance, responses to the survey indicate that competition also acts as an obstacle to reducing the risk of earthquake loss and damage. Lenders seem to feel that requiring earthquake insurance would diminish their competitive advantage, since adding individual insurance or insuring their entire portfolio would increase the cost of a mortgage. This concern is understandable since maintaining prices commensurate with overall market rates is of primary importance to these institutions. Clearly, economic considerations contribute to hazard

vulnerability, and, in this case, the goal of profit deters hazard mitigation.

Baran and Sweezy (1966) describe economic corporate behavior as a "systematic temporal search for the highest practicable profit" (p. 25). They postulate that the primary goals of modern large-scale business are "high managerial incomes, good profits, a strong competitive position, and growth" (p. 15). Whether the implementation of a prudent earthquake policy would seriously threaten these goals will not be argued here. The important point is that some lenders perceive such policy as a threat. In the search for profits, 11 out of the 12 institutions surveyed rejected the notion of reducing earthquake risk to their portfolios. The lenders' failure to perceive earthquakes as substantial hazards may also contribute to disaster vulnerability. Although it first appeared that lenders are divided on their perception of the earthquake threat, further questioning directed at the vulnerability of their portfolios revealed a reasonable estimation of the effects of an earthquake on the lending community. Lenders generally recognize the probability that they would incur substantial financial losses from an earthquake.

Anderson and Weinrobe (1980) indicate that, in California, the one recent natural disaster with which a substantial loss was associated was the San Fernando earthquake of 1971. Although at the time their study was published complete information was not available, apparently over 200 single family residences went into foreclosure or had deeds turned over in lieu of foreclosure, and significant property abandonment took place within the first seven months following the earthquake. The Kaplan, Smith & Associates study (1981) points out that of all natural

disasters, earthquakes appear to present the greatest potential loss to residential lenders. The statistics associated with the San Fernando earthquake bear this out. Despite its moderate physical size, the 1971 earthquake ranks as one of the largest in terms of dollar damage and was the only natural disaster in recent U.S. history which caused a significant number of defaults.

Individual economic problems following the San Fernando earthquake point out another contributor to disaster vulnerability: the health of the mortgage market and economy in general. Kaplan, Smith & Associates point out that "economic conditions in the disaster area are of considerable importance in terms of the immediate and long term effects of disaster" (1981, p. 229). Specifically, if the area is in poor economic health, the effects of the disaster can be magnified. In 1971, when the San Fernando earthquake occurred, southern California was experiencing a rather severe recession due, in part, to a decline in the aerospace industry. At the time of the earthquake, foreclosure rates in the Los Angeles SMSA were much higher than those nationwide. It seems likely that the earthquake compounded the effects of the recession and resulted in a substantial number of post-disaster foreclosures. Of course, the correlation between the earthquake and the large number of foreclosures does not prove a causative link. It does suggest, however, that the simultaneous occurrence of poor economic conditions and an earthquake can result in large financial burdens and default for many homeowners.

In summary, economic factors affect the mortgage market in two ways: (1) they prevent both the mortgagor and mortgagee from insuring against earthquakes since the cost of the mortgage would then become prohibitive; and (2) they compound the effects of a great earthquake if

it occurs during a recession. Although the effects of precarious economic conditions were not dealt with explicitly in the research reported here, they were an issue that emerged and certainly should be considered as a variable contributing to disaster vulnerability in California.

Conclusions and Implications for Further Study

Unfortunately, the reasons for the lenders' behaviors relative to the earthquake threat were not probed further. However, Kunreuther's research on the rational behavior of homeowners towards hazards (1973, 1974) seems to explain the lenders' behavior well. Using an ordered choice model which utilizes the concept of bounded rationality, Kunreuther shows that there exists a certain set of events whose combined probability is small enough to constitute an acceptable level of risk (1973, p. 4). The earthquake hazard in California might be included within this set. Accordingly, lenders ignore the potential consequences of a large earthquake, and, as indicated, consistent government aid in the past may easily be one influential factor affecting this ordered choice decision.

Of course, none of the factors highlighted in this study is solely responsible for hazard vulnerability. For example, recognizing the effects of competition and the profit motive may help us understand disaster vulnerability, yet by themselves they are not an explanation. Likewise, federal benevolence is not the sole contributor to disaster vulnerability. At least one institution has actively attempted to reduce its dependence on federal disaster loans by refusing to lend in one narrowly defined area. However, even this lender stated that the utilization of federal disaster loans would be part of its recovery plan following a major earthquake. In order to understand disaster

vulnerability in California, one must consider many factors including economic competition, governmental paternalism, the political and economic power of financial institutions, various affected groups' perceptions of the hazard, market conditions, land use, building codes, and other influences.

Many unanswered questions remain from this study. For instance, we need to know more about the role of competition as an obstacle to adopting hazard reduction measures at an institutional level. We also need to know why state and local government policies often oppose the policies of the federal government. We need to examine structural constraints on hazards policy decision making. For example, we might ask how private property ownership and concepts of individualism affect disaster vulnerability, the implementation of hazard policies, and the real costs of disaster mitigation and relief. More intensive research directed at the political and economic structures of American society and their interaction with individuals and disasters will help us to better understand the genesis and consequences of hazard vulnerability.

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