UNIVERSITY OF DELEWARE
DISASTER RESEARCH CENTER

BOOK & MONOGRAPH SERIES
#24

INDIVIDUAL AND ORGANIZATIONAL RESPONSE
TO THE 1985 EARTHQUAKE IN
MEXICO CITY, MEXICO

1990

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Perhaps nowhere in the world do two countries as
different as Mexico and the United States live side
by side...Probably nowhere in the world do two
neighbors understand each other so little.

Alan Riding
Distant Neighbors, p. ix.

PREFACE

This volume summarizes a 24 month field project that was undertaken by the Disaster Research Center (DRC) and that ran from June 1986 through May 1988. As such, it highlights the general findings and major themes of our work. Therefore, we do not present all the detailed findings from our study or all the special analyses that were done. All the results from that more specialized effort are provided in other publications.

While individual and organizational responses to a major urban earthquake--the prime focus of this volume--occur in all such disasters, the research being reported is relatively unique in several respects. First, the research represents one of the few truly cooperative cross-societal disaster studies ever undertaken by social and behavioral scientists. The work involved dozens of Mexican nationals and dozens of citizens of the United States. Second, systematic social science research in the immediate aftermath of a major earthquake especially in a very large metropolitan area is almost nonexistent. Therefore this is a rather pioneering piece of work. Finally, the research findings in the pages that follow challenge some widely held views both about the response in the Mexican disaster itself and about how it is thought people and groups will react to an earthquake in a large urban area.

In this volume, we follow standard DRC policies in reporting any descriptions or analyses of our data. We do not identify particular individuals or officials, and in many cases do not even name the specific organizations we looked at in our research. The only exception is when the information about groups or persons has already been published by others and is in the public domain.

Our report follows the traditional DRC and scholarly policy of citing references and otherwise documenting what is reported. But almost all of the statistics and examples used in the volume were computed from or derived from primary data in the Center's files. All such material not referenced can therefore be presumed to have been derived by DRC from its own data base

This publication, is intended for many audiences. It is primarily aimed at disaster policy makers, disaster planners, and disaster researchers. We also think what is said can benefit many others ranging from social and behavioral scientists abstractly interested in responses to collective stress situations to many operational personnel concerned with the specifics of dealing with human and social responses to earthquakes. We think the account might also interest those citizens of Mexico who underwent the very stressful situation of a major disaster.

Part I of the report provides a general introduction to the study by presenting some background material. First, we briefly describe some of the sociophysical aspects of the earthquake and its impact in Mexico City. Next the nature and sources of the data we obtained and analyzed in our study are discussed. We conclude this section with an overview of the Mexican political and governmental scene as this provides the general social context in which the impact occurred and where the organized response developed.

Part II of the report specifically describes the postimpact organizational behavior in Mexico City. We lead into this with a description of the very complex preimpact governmental structure in the metropolitan area of the capital and the general lack of prior disaster planning, both of which significantly affected group and agency response to the earthquake. To set the context for what follows we then present a brief factual chronology of events in the two weeks after the earthquake. This leads into a portrayal of some of the major organizational responses in the first three days after the impact. Initial governmental actions are particularly depicted as well as the responses in selected but important public and private sectors. This is followed by a description of the organized responses of key governmental and private groups for the rest of the two week emergency period. Some longer run organizational consequences of the disaster are also indicated.

In Part III we narrow our focus to the human beings involved. Two major population surveys are used to describe the behavior of individual citizens in Mexico City after the disaster. The first survey, undertaken less than three weeks after the earthquake, allows us to depict the impact consequences of the disaster on individuals and households, the mass communication behavior of the victims, their volunteer behavior, and the attitudes and evaluations that the population had about governmental and other impact-related activities. The second survey, done about a year later, permits us to discuss the longer run earthquake problems as seen by citizens, their attitudes about the handling of disaster related problems, and what people learned from the experience of the disaster.

Part IV , more analytical than descriptive, first sets forth the major research findings or themes of our study. We then discuss the similarities and differences between the organizational and individual responses found in Mexico City and what have been observed in disasters elsewhere. We conclude with an indication of some implications of our work for future research studies.

The history of the study and its collaborative nature, the field data obtained and the kinds of analyses undertaken, and copies of the survey and interview instrument used, are presented in three appendices.

ACKNOWLEDGEMENTS

In addition, certain officials in the Mexican government were very helpful in providing us with an understanding of their society and their governmental structure. They patiently provided answers to our many questions and offered useful suggestions and ideas on how we might proceed. They undoubtedly prevented us from making some dangerous blunders during the course of our work. Among those we would especially like to thank for their courtesy and assistance are Juan Carlos Padilla, the General Coordinator of the Civil Protection System, and Julio Cesar Margaine of the Secretariat of Government. Of course these officials are in no way responsible for whatever is expressed in these pages. They had no control over the study, no access to the primary data, and they will not have seen any of the research findings until this volume appears.

Last but not least, we wish to acknowledge the help of hundreds of Mexican citizens and those officials who provided the primary data for our study. Many while still struggling to recover from the earthquake, took precious time to answer a lengthy survey questionnaire or a long interview guide. We hope that our report, partly based on the information they provided will help others to better prepare for and respond to future disasters.

Finally, since ours was the final decision on much of the data gathering and on all of the data analysis and report writing, any faults, shortcomings and errors in this volume are our responsibility alone.

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Dennis Wenger*

*When the first draft of this report was written in early 1988, Prof. Wenger was still on the staff of the Disaster Research Center at the University of Delaware; he subsequently moved, where he presently is, to the Hazard Reduction and Recovery Center at Texas A & M University.

December 1990

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PART I BACKGROUND

In this background and introductory section we describe the major effects of the earthquake studied, the kind of data that were obtained, and the Mexican sociopolitical context in which the disaster occurred.

First, there is a short description of some physical aspects of the earthquake and some indications of the material damage which was created in Mexico City. This is presented just for introductory background purposes because later in the volume more detailed information is provided from our survey results.

Second, we provide a brief statement on the sources of data and the data collection effort which serve as the base of our descriptions and analyses. The more detailed depiction of these are given in appendices (II and III) to the volume.

Third, we conclude this part of the report with an overview of the preimpact political and governmental setting in Mexico which influenced the emergency time response to the disaster. It is our contention that understanding the short run postimpact reactions, as well as some longer run organizational changes, requires some knowledge of the Mexican social context in which the impact occurred and where the response developed. The beginning of such an understanding is in the special position and power of the Presidency within that political system as well as the distinctive position of the Federal District within the governmental administrative structure.

CHAPTER 1.

THE EARTHQUAKE AND ITS SOCIOPHYSICAL EFFECTS

Mexico, and especially parts of the metropolitan area of Mexico City suffered a major disaster in late 1985. The interaction between two tectonic plates generated a great deal of accumulated energy which was released in two earthquakes: one on September 19, and the other on September 20 (we will not except in a few instances distinguish between the two earthquakes in the rest of this report). The first registering 8.1 on the Richter scale occurred at 7:18 am; the second at 7:38 p.m. on the next day registered 7.5 on the scale and happened about 36 hours later while rescue work was still going on after the first earthquake and while the President of Mexico was in the middle of his fourth on-the-scene inspection tour of damaged areas.

Although the epicenter was about 230 miles away, the greatest impact was in Mexico City (Esteva, 1988). The greatest physical damage was concentrated in relatively few localities where the site conditions and buildings were particularly sensitive. One estimate was that the directly affected neighborhoods involved only 3.2 percent of the federal district (Terremotos 1985 Mexico, 1986: 7). Also, the metropolitan zone emergency committee in a statement issued a month after the disaster said that over 90 percent of the heavy damage to buildings was concentrated in but three boroughs or subdivisions (formally known as delegaciones) of the urban area. However, as we shall document later, this is an underestimation of all building damages and does not take into account that there was major social disruption and indirect effects in much larger parts of the metropolitan complex.

The Mexico City area is subject to numerous seismic shakings every year. The first one recorded in historical chronicles occurred as far back as 1637 although there are recorded reports of earthquakes in Mexico as early as 1460 (Earthquake Mexico '85, 1986: 22; see also the listing in Manzanilla, 1986). A more recent survey indicates that there are an average of 90 per year that register 4 or over on the Richter scale (Herrera, 1986). In fact, in the 45 days following the September earthquake, there were at least 150 tremblers that ranged from 3.5 to 5 on the scale (Terremotos 1985 Mexico, 1986:2). Major earthquakes have occurred in six times in the last 150 years: in 1845, 1859 (which may have been the strongest of all), 1911, 1932, 1957 and the one in 1985. The one in July 1957, whose epicenter was on the Pacific coast about 170 miles away, killed about 160 people, damaged several thousand buildings and resulted in property losses of about 25 million US

dollars, mostly in the downtown area (<u>Earthquake Mexico '85</u>, 1986: 11).

The metropolitan area is especially vulnerable for several reasons. For one, since Mexico City was a town built in the Aztec era above Lake Texcoco (a body of water which existed until the start of this century), many parts of the area--especially the old city in the central zone--now rests on extremely weak and insecure ground. Also, increasingly there is more of a social nature to impact in the 890 square mile area. The number of inhabitants has grown dramatically, possibly tripling in the last two decades (<u>Terremotos 1985 Mexico</u>, 1986: 7). Census figures are only partially current, but it is probable there are between 18-20 million residents, over a fifth of the country's population. An indication of the size of the city is that the subway system alone carries about 4,850 000 passengers every working day!

As noted earlier, at 7:18 am on the morning of September 19, 1988 Mexico was struck by a major earthquake, measuring 8.1 on the Richter scale. The earth movement inflicted some overt damage in the states of Colima, Guerrero, Jalisco, and Michoacan where perhaps 600 were killed and more than 2,000 buildings were destroyed or damaged. But the greatest destruction and damage occurred in the federal district of Mexico City. The next evening at 7:38 pm another major earthquake measuring 7.5 on the Richter scale occurred during the carrying out of initial rescue and relief activities in the capital city.

Whether looked at in general or in specific terms, the more obvious sociophysical consequences of the earthquake in Mexico City are impressive. The earthquake in all of Mexico was probably not as absolutely or relatively disruptive or damaging as the Tangshan one of 1976 in China (where over 275,000 persons died) and perhaps not even the Chilean earthquake of 1985 (where over 400,000 persons were made homeless), neither of which got anywhere near the mass media or world attention that the Mexican disaster received. Yet if the estimates are anywhere near correct, the Mexico City earthquake of 1985 was without doubt a major disaster.

Thousands of persons were killed and tens of thousands were injured. At least a hundred thousand building units, mostly residential ones, were damaged in some way. Hundreds of thousands were made homeless. Tens of millions of dollars were lost in the tourist trade and hundreds of millions in wages by workers who became unemployed as a result of the earthquake. Billions of dollars worth of material damage was done.

Reconstruction and rehabilitation costs, estimated at five billion US dollars (although some estimates run as high as 10 billion, see <u>The 1985 Mexico Earthquake</u>, 1986), was the equivalent of about six percent of the Gross National Product (Arnold, 1989: 63). The World Bank alone provided over a half billion dollars in loans for

reconstruction purposes (Kreimer, 1989). The earthquake was also the worst in decades in terms of the overall insured loss, being exceeded only by San Francisco in 1906 and Tokyo in 1923.

Even when looked at in more specific terms the consequences are impressive. To be sure, even several years after the disaster, exact statistics are lacking as to deaths, injuries, building and property destruction, economic losses or whatever usually could be measured; nevertheless overall the effects were major along a number of different lines. The destruction from the two earthquakes was diffuse and somewhat spatially random throughout the huge metropolitan area. But the complex nature of the subsoil resulted in variation in intensity as well as in damaging resonance effects. Thus, the most damage tended to be concentrated in the north central and eastern sections of the city. In those localities, certain working class neighborhoods such as Morelos, Centro, Guerrero, Doctores, Antonio Abad, Nonoalco-Tlatelolco, and certain middle class areas of Cuauhtemoc, Roma, Condesa, and Juarez were particularly hard hit. Although even two years after the earthquake, figures on building damage issued by different government agencies continued to vary considerably, it appears most of the major damage was centered in three of the delegaciones, namely Benito Juarez, Gustavo Madero, and Cuauhtemoc--the last suffering the most physical damage to buildings. There were particular major pockets of destruction; for example, 43 out of 102 apartment buildings were left unfit for living in Nonoalco-Tlatelolco; 80 percent of the buildings were destroyed or damaged in Morelos (Mendez, 1986: 25).

Apart from the physical damage, there were according to official statements at least five thousand people killed and 14,000 injured. As we shall discuss later, our own survey findings suggest that as many as 2,000,000 residents of the capital at least temporarily moved out of their own homes. Two years after the earthquake, around 90,000 victim _families_ had been rehoused (Storlarski and Santa Maria, 1987: 2).

Other residents of the city, while their own homes were not directly affected, either lost or had their employment interrupted. For example, there is one estimate that 1,326 buildings housing more than 10,000 shops and factories, such as textile and clothing manufacturers, suffered damages (Mendez, 1986: 25), and of course many government agencies housed in over 240 damaged buildings did not resume normal work functioning for days in most cases and weeks sometime (over 150,000 public employees eventually had their work location relocated elsewhere, Perez, 1987: 13). In addition, about 761, 1,435 or 1,687 public schools (depending on which statistics are used) out of around 3,000 suffered structural and/or non-structural damages (Armillas, 1983; de la Madrid, 1986: 5; Mendez, 1986) interrupting the education of over 650,000 children according to some reports (Robinson et al., 1986: 90). Since these kinds of everyday work and school activities were badly affected, ceasing

in many cases, there was a massive disruption of normal routines in the community (see Thier, Gratton and Johnson, 1986; Gratton, 1987).

This was complicated by the fact that many important public services could not function normally. For example, the central telephone exchange was damaged; one consequence was that apart from affecting local phone communication, almost all national and international long distance and telex and telegram lines were renderable inoperable. Along with damages to eight power generating substations about 1,280,000 electrical installations were damaged (de la Madrid, 1986: 5). In addition, with five destroyed and 22 damaged hospitals (including major health centers such as the Juarez Hospital, the General Hospital and the Medical Center) there was a loss of 4,260 hospitals beds, about 30 percent of existing capacity (Armillas, 1989: 3).

By these physical or material criteria alone, what happened was a major disaster. In addition to these many tangible physical consequences, the largest urban complex in the world also suffered many somewhat more intangible or social negative effects, as we shall document later. This report partly attempts to describe the more important ones and particularly the reactions of the citizens of Mexico City and their organizations to the occasion.

CHAPTER 2.

SOURCES OF DATA AND DATA COLLECTION

Earthquakes have been noted in history as far back as oral and written records go. However, studies especially of a systematic nature of the more social aspects of such disasters are a very recent phenomena. Inventories of the social science literature credit research by the National Opinion Research Center at the University of Chicago done on the 1952 Bakersfield, California earthquake, as the first field study of its kind (A Preliminary Report, 1954). The most complete inventory of such work up to 1979 lists only 26 other studies done by social scientists of such occasions as the Alaskan, Niigata, Chilean, Western Sicily, Gediz, Banja Luka, Peruvian, 1971 southern California, Managua, Guatemala City and Friuli earthquakes (Quarantelli, 1984b). However, work on these and even more recent ones such as in Southern Yemen, Campania Baslicata in Italy, and Coalinga, has either not been systematic, done immediately after the disaster and/or of a large urban area. Thus, we had little direct guidance from previous social research on earthquakes on how to proceed in our study of the Mexican City disaster.

However, there is a rather substantial literature from nearly 40 years of research on other kinds of disasters (see Kreps, 1984, 1985), and DRC used that in its approach. We decided to concentrate primarily on the emergency time period reactions and the immediate postimpact response, and secondarily on whatever longer run social effects we could study. This still left us with many research possibilities. After discussions with our Mexican colleagues (see Appendix I for a description of the collaborative effort involved), we eventually centered on two different but related aspects.

On the one hand, we launched a study of the emergency time response of organizations in Mexico City to the earthquake; this was partly dictated by the fact that DRC has over the years undertaken extensive studies of organizational responses to disasters (see, e.g., Warheit and Dynes, 1968; Dynes, 1974; Dynes, Quarantelli and Kreps, 1981; Quarantelli, 1990). On the other hand, we also made a decision to study behavior at the individual or human level; in particular DRC saw in this situation a possibility of carrying out systematic social science surveys of a metropolitan population involved in a disaster, which as just noted above is a rather rare research undertaking up to the present time. We also saw a possibility of seeing the individual behavior occurring in the larger context of organizational behavior.

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With the assistance of our Mexican colleagues, DRC obtained three major sets of primary data: survey results, in-depth interview protocols and documentary material.

The survey results. The Instituto de Investigacion de la Comunicacion (Instituto), in consultation with DRC, carried out two population surveys about a year apart. These surveys differed from one another in some respects. (See appendix III to this report for the English language translated copies of both survey instruments). The first survey was conducted during the first week of October 1985, about two weeks after the earthquake, when 567 respondents from the general Mexico City area were contacted. All those interviewed were 16 years of age or older, and the sample was stratified with respect to gender, age, and socioeconomic status. The sample is statistically representative of the larger population universe with a margin of error of three percent.

Topics covered in the survey included: how well the government handled a dozen major earthquake related tasks such as search and rescue, the feeding of victims, the sheltering of the homeless, and the providing of information, etc.; usage of the mass media and attitudes about the reporting of the disaster; perceptions and evaluations of the actions of the Mayor's Office, the military, the police, the President of Mexico, and volunteers following the earthquake; disruptions of services and damages to homes as a result of the disaster; what earthquake occasioned problems should have priority for action; and what kind of volunteer work the respondent did in the trans- and post-impact period of the disaster.

Also, each of the 567 respondents were treated as informants for certain purposes. They were asked to provide information on earthquake-related activities of every member of their household. Therefore, information was available on the extent and nature of volunteer activity for a total of 2,965 individuals. The usual demographic survey background items were obtained for all respondents.

The 1986 survey while it repeated some of the questions asked in 1985 differed in the following respects. A total of 749 persons, sampled in the same way as indicated for the earlier survey, were interviewed. Topics covered included the following: the longer run problems brought about by the earthquake; whether the respondent provided and/or obtained housing and sheltering as a result of the disaster as well as the nature and duration of that kind of assistance; perceptions and attitudes regarding how the government generally and specific agencies (e.g., the police, the telephone company, the Red Cross, the Health Secretariat, the Social Security Institute, the fire department, etc.) had handled earthquake related problems; what had been individually learned from the experience and the knowledge that existed of disaster planning;

comparisons of the handling of immediate post impact earthquake problems and later ones; evaluations of earthquake related tasks such as the handling of foreign aid assistance, the reconstruction of hospitals and schools, the restoration of the water service, the demolishing of damaged buildings and the clearing of debris, the providing of shelters and housing for the victims, etc.; the nature and duration of any volunteering action undertaken; and some of the consequences of the earthquake on preexisting social problems in the capital, as well as the usual demographic survey background items.

The in-depth interview protocols. In addition, La Facultad Latinoamericana de Ciencias Sociales (FLACSO) obtained over three dozen in depth interviews of organizational officials who played major roles in the disaster. DRC drafted the initial interview guide, provided field training in Mexico for the Mexican students who actually conducted the interviews, and recommended who should be interviewed in which organizations. While not formally intended to be a longitudinal study, because the interviews were conducted over a number of months in the year following the earthquake it was possible to obtain information not only on emergency time response but also some of the recovery activities of the involved organizations.

There were lengthy, formal interviews with over 20 representatives in various subunits of the Mayor's Office (what we shall later call the DDF) involved in such varied tasks as central policy formation, public information, urban planning, medical services, public works, hydraulic systems, police and fire operations, transportation, legal services, utilities, morgue operations, the office of civil protection, and from representatives of various delegaciones within the larger office, as well as activities which developed in the aftermath of the earthquake such as listing missing persons. In addition, another 17 long interviews of a formal nature were conducted with representatives from PEMEX (the Mexican national petroleum company), the Red Cross, unions of hospital workers and tenants, and federal agencies including the military. The substantive focus of all the 37 interviews was on intra and interorganizational activities and the behavior of organizational personnel (for translated copies of the interview guides used, see Appendix III).

Documentary material. Besides the survey and organizational data, DRC obtained relevant information from a variety of other sources. With the help of our Mexican colleagues, we were able to acquire a number of Spanish language publications on the earthquake, some of a popular nature but some done in a social science framework. In addition, the Center collected whatever English language reports it could find on the earthquake. In all we eventually acquired about five dozen such items. This set of material proved very useful for background purposes as well as for looking at some

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organizational changes which occurred in the year following the
earthquake.

The study design, therefore, was developed in collaboration with
our colleagues in FLACSO and the Instituto. This collaboration
resulted in the development of interview and survey instruments
which allowed data collection to flow from existing theoretical
understanding about the emergency time behavior of organizations
and persons, but yet were adapted for the individual and group
sociocultural patterns which existed in Mexico City at the time of
the earthquake. All interviewing, whether it involved in-depth
organizational interviews or survey interviews, were conducted in
Spanish by native speakers. The organizational interviews were
translated under DRC supervision in the United States into English
and analyzed solely at the Center.

CHAPTER 3.

THE MEXICAN POLITICAL AND GOVERNMENTAL CONTEXT

From our vantage point, the importance of the earthquake lies not below the ground in the interaction of tectonic plates but on the surface in the interaction of people and organizations in dealing with the social consequences. An earthquake like any other physical happening with disastrous consequences occurs within a particular social context. The social response to the disaster which is our concern occurred in a specific city, Mexico City, which is the capital of Mexico. To understand that particular social context requires some understanding of the Mexican political and administrative structure especially since our study partly focused on the emergency response of various organizations, many of them governmental agencies.

Involvement in the emergency time period of any disaster anywhere is dependent initially on the predisaster patterns of formal organizational obligations, the mix of governmental and non-governmental activities, and notions of political accountability and responsibility. Such patterns, of course, can vary considerably from one social system to another. Our intent here is to provide some initial points of reference concerning the Mexican political structure which are important for understanding primarily the emergency response and secondarily for the later organizational changes.

At a formal level the governmental structure in Mexico is highly centralized with the federal government selectively delegating power to 31 states and 2,379 municipalities. These municipalities are the primary political and administrative units of government. Municipal governments are headed by mayors who are elected for three year terms.

One scholar of Mexican society has provided this overall summary of that structure:

> My working conception of the Mexican political
> system is one of a centralized, statist,
> inclusive system with corporatist features in
> which the presidency confronts a number of
> contending forces which it can manipulate in
> various ways. (Bailey, 1988: 12)

Bailey goes on to suggest that the system belongs to the family of populist movements in Latin America which were spawned by the

Depression of the 1930s, and is based on a multi-class coalition of groups which emphasize a nationalist agenda and endorses a reformist policy agenda. Another Mexican scholar, Reyna, writes about a populist corporatism in which politically significant groups are linked by a complex network of political organizations which relate these groups to the decision making process. Such a political structure:

> tends to eliminate competition for power and emphasize conciliation among different societal groups through their vertical or subordinated relationship to the state apparatus (Reyna, 1977: 156).

Two critical elements in this political system are the power of the Presidency and the dominant role played by the official political party, namely the Institutional Revolutionary Party (PRI). First, much of the power and prestige of the Mexican political system is centered in the office of the Presidency. In fact, one observer of the system puts it this way:

> The President is the government, and all discussions of Mexican politics must assume that fact (Tannenbaum, 1948: 45).

Perhaps the best way to summarize the complexity and importance of the President's power is to see that office as the nerve center of many demands by various interest groups. As the nerve center, the President must moderate conflict and dispense rewards to balance competing interests so that the coalitions will not fall apart. While such a concentration of power is impressive, it also has its drawbacks, since the President must accept responsibility for all that occurs with the system, even though it is impossible to directly "oversee" the entire system.

Second, under one name or another, the dominant political party, the PRI, has held power in Mexico since 1929. It would be a mistake to consider the PRI in the same context as political parties in the United States, that is, as constituting political support for rather concrete policy alternatives. One way to understand the PRI is as a political bureau at the service of the President and that serving the President is its major political task. One observer suggests that:

> The PRI is a vast elite class, surrounding an authoritarian president but the class holds many dissimilar and often contradictory elements (Bailey, 1988: 129).

Many observers have indicated that the PRI was never designed to be a political party but rather its essential features were constructed during the late 1930s as a mechanism to integrate new

elements, especially laborers, farmers and middle class groups into politics in a rather controlled fashion. The party became a kind of holding company of groups at a time of relative social simplicity. The party has evolved as a rather complex structure to absorb and broker conflicts as well as to mobilize support for presidential initiatives.

While the PRI has been historically important in the evolution of the Mexican political system and still continues to be important, perhaps much more significant today has been the evolution and growth of what is generally called the "political" bureaucracy. That bureaucracy, closely integrated with the PRI, has grown significantly in recent years. That growth has resulted from the failures of traditional populist style politics to benefit as much as might be desired the labor and peasant constituencies within the PRI. More recently, there was a new form of populism which emerged which emphasized that state enterprises, especially petroleum reserves which were managed by technocrats, that is traditional bureaucrats could create wealth which would be distributed through public agencies to constituent groups. This has meant the ascendancy of technicians in the traditional political system as well as the development of new federal programs which link groups directly to the government and by-pass the party.

While the previous discussion has focused on the links between the national political and governmental systems, the administrative relationship between the federal level and local governments is also important. Mexico City has a distinctive relationship. In Mexico, as in many other developing countries, all roads lead to the capital of the country; the capital is not only the political and governmental center of the country but it also contains the core of the economic, industrial, educational and cultural activities of the nation as well as well. In fact this densely populated metropolitan area:

> produces 44% of the Mexican GNP, contains 25% of the economically active population, is home to 20% of the country's total population, as well as one-third of all public employees in the nation, and absorbs 25% of the Mexican federal budget and 33% of all government investment (Robinson, Franco, Castrejon and Bernard, 1986: 87).

In part because of this, Mexico City has a special status. It is a Federal District and in that is unlike other local governmental entities in Mexico.

In one sense Mexico City does have its own municipal government like other cities in the country. But there are complications that stem from having a central government and a municipal government functioning in the same location. So while the residents of the

Federal District can elect their own deputies and senators for the Mexican Congress, the executive head of the District, the Regent or "Mayor", is appointed and removed by the President. The Mayor names other top "local" officials but only with the approval of the President. This close political and administrative relationship often makes it difficult to have a clear cut demarcation between the various functions which the District should perform and those that the central government should provide.

A further understanding of the position of Mexico City in the larger governmental and political system can perhaps be achieved by making a comparison of the similarities and differences between the capital of Mexico and Washington, D.C. The Federal District of Mexico City (DDF) and the capital of the United States are similar in that they are both federal districts. However, the former is far more complex than the latter or what is usually the referent of the term in cities in the United States. For most purposes, the "Mayor's Office" in Mexico City is synonymous with the entire local governmental structure. Under its domain are such varied functions as police and fire operations, water, sewer, transportation and communication, health, social security and welfare activities, streets and construction, and civil protection.

In addition the DDF is subdivided into 16 boroughs or delegaciones. Within these 16 areas there is considerable autonomy and control of the various metropolitan governmental functions. In many respects there is a decentralization of operational functions. Therefore, on a normal, everyday basis the structure of the local government illustrates dialectically posed forces of formal structural concentration and operational decentralization.

The previous discussion has emphasized certain distinctive feature of the Mexican political system. It is characterized by the centralization of power in the Presidency. That power is nurtured by the PRI and the political bureaucracy. The power further radiates down from the central government to the DDF. Within the DDF there are further structural subdivisions which have distinctive functional or operational responsibilities.

There is reasonable consensus on such a picture by various scholars of the Mexican political and governmental system. But that consensus should not lead to a conclusion that there are no points of contention and disagreement within the system. In fact, the system has evolved on the basis of a necessity to mediate among various contending forces. As such, on an everyday bases many differences will remain muted or latent.

However, this means that at particular times within the life history of a society, certain issues came come to the fore or become manifest. Crises can provide such occasions. Thus an occurrence such as a major earthquake in the capital city could raise a number of latent political and governmental issues, not

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just as abstract arguments but as realistic concerns in the face of immediate emergency needs. This happened in the Mexico City earthquake of 1985.

Our research found that the following concerns surfaced:

1. Given the disaster, who had responsibility for developing the emergency response?

2. Was that responsibility primarily at the federal level or at the local community level?

3. What should be the relationship between the central government and local governmental entities with respect to the types of contributions each could make in such an emergency response.

4. What governmental agencies should be involved in the emergency response?

5. What are the roles which these governmental agencies should perform?

6. To what extent is the emergency response the sole concern of governmental agencies?

7. What role should private organizations have in the emergency response?

8. Who should have the responsibility to coordinate the activities of public and private groups?

9. Are these responsibilities assigned as a result of some form of prior disaster planning?

10. How much of the emergency response should be directed by "political" considerations as opposed to technical bureaucratic ones?

Beside the complexity of these issues which surfaced in the development of an emergency response, there were two other diffuse concerns which emerged in the emergency period. One of the issue was the proper role of the military in the disaster response and the other centered around the future political consequences of the earthquake.

Civilian-military relationships have, not surprisingly, been the focus of some concern within the Mexican political systems. As one scholar has said:

> The spectrum of civil-military relationships in twentieth-century Mexico has ranged from

> total military supremacy from 1910 to 1920, to
> almost complete military submission to civilian
> authority from the fifties through the late
> sixties. From the late 1960, the tide turned
> toward more military influence and that trend
> will continue for the foreseeable future
> (Williams, 1986: 149).

It is not difficult for many to recall that it was not until 1946 that Mexico elected its first civilian president. In addition, in recent years, 1968 to be exact, the military played an important role in intervening in the political system to crush demonstrations which opposed allegedly extravagant spending for the Olympics. Several Mexican scholars, including Reyna (1977) argue that the army as an institution was likely to be kept out of politics because in part, the military elite had been coopted by the PRI. That is, the military would not act as an independent political force since now it was well integrated into the political apparatus. While that view generally prevailed, at the time of the earthquake there was some concern that the disaster might be exploited by the military to enhance its power. As we shall see, the military was not allowed to implement a national disaster plan that would have given it formal control of the capital city.

Such a concern was part of a larger set of concerns about the consequences of the earthquake for political stability. As noted earlier, the political system can be viewed as a delicate balance of contenting forces which is monitored by the President. The social effects of the earthquake held the potential for disrupting the existing balance and creating significant political problems for the future.

To a certain extent the social disruptiveness of the disaster might have created a politically new and dangerous "constituency" for the political system, namely the "victims". In the past other potentially "dangerous constituencies" or divisions within the society---laborers, peasants, the urban poor, etc.---had been incorporated into the political system, especially by representation in the PRI. But disaster victims were a new social category whose characteristics were unknown and who could perhaps coalesce or crystalize into some politically dangerous group or social movement. There were generally no established leaders of the victims who could be identified and perhaps coopted. There were a few identifiable small political groups that became involved with disaster victims and participated in public demonstrations after the earthquake. But because of their ideologies they were almost inherently anti-governmental in nature and not inclined to support the existing political status quo.

Also, there was some concern that long standing social divisions within Mexican society might have been further magnified by the earthquake. Later we shall indicate that our survey results showed

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that there were consistent social class differences in reactions and behaviors with respect to the disaster. But the concern in some political elites right after the earthquake was that political movements among the urban poor could be given new life and new political agendas by the disaster. If hostility did develop on the part of the victims, such hostility could easily be directed toward the existing political arrangements. That is, much of the blame for the problems of disaster victims might be placed on the President. While as we shall indicate later, our survey data do not support the widespread development of such a perception among victims, it nevertheless appears that such a concern did exist in certain high level political circles in the aftermath of the disaster.

This apprehension about the social effects or aftermaths of the earthquake had another dimension. In a study more than a decade ago Cornelieus (1977) examined the political consequences of the existence of a large numbers of migrant poor. He points out that past smaller scale disasters in urban neighborhoods in Mexico City had traditionally provided an opportunity for the regime to demonstrate its concern for the welfare of the poor. He notes that both the Federal District and the "popular" sector of the PRI had often organized disaster relief operations, much in the style of the big city political machines in the United States in their heyday. Such kind of assistance in Mexico City was highly visible and had lasting psychological and political impact; at the same time, the overall cost was relatively small and there was no commitment necessary for continued assistance. Cornelieus concludes that such:

> qualities make disaster relief highly attractive to the government as a means of building support among the more disadvantaged sectors of the city (1977: 207).

If quick, highly visible but "one shot" politically motivated assistance to a small number of disaster victims was seen as important, the consequences of having large number of victims needing longer term assistance could provide a politically explosive situation for which there were no easy solutions. Some Mexican writers have made the same point:

> In a Latin American nation like Mexico, where the political and administrative apparatus operates in a complex web of patronage, established political groups have a lot to lose if they cannot respond quickly and effectively to the needs of people who have been struck by a disaster (Robinson, Franco, Castrejon and Bernard, 1986: 84)

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In addition to the political repercussions which might have emerged, there were some doubts expressed that the individual who held the Presidency at the time of the earthquake could or would act in a traditional political way. Earlier it was mentioned that technocrats have come to dominate national Mexican politics. The incumbent at the time of the earthquake, Miguel de la Madrid was the third President in a row who never had held any prior elective office. Furthermore, almost all his appointed cabinet were technocrats.

From the viewpoint of more traditional politicians, the technocrats are thought do not possess the necessary skills to run the country. By their training and outlook, technocrats are likely to apply technical methods to solve problems in which political issues are reduced to "mathematical equations". Traditional politicians viewed the technocrats as having little ability to negotiate and compromise as well as having difficulty in dealing with "public" events. At the interpersonal level, technocrats are seen as being much more comfortable in dealing with each other than they are with the "masses" (Smith, 1986: 110).

In any case, one of the important political issues which the earthquake raised was the ability of a regime that was dominated by technocrats to deal with a disaster that might be of considerable political import. In the past, the social effects of disasters had been "solved" by traditional political methods, not technical instrumental ones. The situation also has to be seen in the context of an earthquake hitting a country with a 97 billion dollars (US) foreign debt and whose oil prices had fallen within a relatively short period of time from $24 to $15 dollars a barrel.

Thus, in September 1985 Mexico was a country with a particular political and governmental system which had certain vulnerabilities to unexpected crises (besides sources already cited see also the analyses in Hamilton, 1982; Cockcroft, 1983; Hellman, 1983; Johnson, 1984; Camp, 1986 for discussions of various aspects of problematical features of the Mexican government and politics). The disaster potentially could have had a major destabilizing effect on the social system as a whole and might threaten the power of the PRI. It is in this context that the organized response in Mexico City to the earthquake developed and to which we now turn.

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PART II: ORGANIZATIONAL BEHAVIOR

In this part of the report, we discuss what we found about organizational behavior in the immediate aftermath of the Mexico City earthquake, and also make some observations about longer run group changes. In particular, we describe the following activities.

First, in chapter 4, we note what was in place prior to the disaster. Thus, in this chapter we briefly describe the structure of government at the level of the Federal District and the kind of emergency preparedness planning that existed before the earthquake.

Then in the following chapter we indicate the basic organizational response patterns, both public and private, that occurred during the first three days of the emergency period. In particular after indicating initial governmental actions, there is a presentation of the general organized response at the level of the delegaciones as well as the response of several key groups. We conclude with some observations about the role behavior of organizational personnel and address the question of their possible role conflict.

Next in chapter 6 we depict the various problems and difficulties that emerged as organizations attempted to cope with the demands of the earthquake after the third day but still during the emergency period (which end approximately two weeks after the initial earthquake). In particular, we indicate the organizational response to 12 disaster related problems, namely: distributing information, doing damage assessment, undertaking search and rescue, providing emergency medical care, maintaining security and access control, drawing up lists of missing persons and victims, handling the dead, restoring public utility services, sheltering and feeding victims, requesting and handling aid, integrating volunteers into organizational activities, and coordinating the response. We conclude this chapter with a presentation of the retrospective view about disaster planning that emerged among agency officials and bureaucrats and note certain organizational changes that were instituted.

Before indicating our research findings, we should note the following regarding our approach and methodology. Because primary responsibility for responding to the earthquake within Mexico City was placed within the Mayor's Office or the Department of the Federal District (DDF), DRC originally thought it best to focus descriptively and analytically upon this institution and to treat it as an entity of local government that might be similar to local governments in the United States. Therefore, we initially

concentrated upon the response of the Mayor's Office (DDF) and looked at other responding agencies, such as federal agencies and private institutions, as ancillary and of secondary importance in the governmental effort to cope with the earthquake. While this research focus had a number of benefits, it proved to be problematical due to the complexity of the DDF and the massive, decentralized response by Mexican organizations to the disaster. It was simply impossible to concentrate mostly and primarily upon the DDF. Therefore, in what is presented below, we also note the important role of others such as key organizations in the lifeline sector, PEMEX (the Mexican national petroleum company), as well as other public and private groups.

CHAPTER 4.

PREDISASTER GOVERNMENTAL STRUCTURE AND
DISASTER PLANNING IN MEXICO CITY

Governmental Structure. The sprawling, urban area of Mexico City is probably the largest community or metropolis in the world, having a population estimated at between 18 to 20 million. Not only is it the political center of the nation, but it is also the economic, cultural, educational, medical and social hub of the country. Within the metropolitan area are concentrated the major financial institutions, scientific and educational complexes, mass media outlets, industrial and commercial establishments, and hospitals and medical schools of the country.

Being the national capital, the governmental structure of Mexico City is not a part of any of the states of Mexico and maintains its own political autonomy as a federal district. The Department of the Federal District is the governmental body that oversees the provision of public services for the city. The DDF, however, does not have the degree of political independence from the federal government that is associated with most American cities, nor even that which is associated with Washington D.C. The Regent or "Mayor" of Mexico City, for example, is appointed by the President and is not elected by the citizens. Also, the DDF itself is part of the federal organizational structure.

Furthermore, the organization of the DDF is very complex, both with regard to the variety of functions that are performed and the structure of intraorganizational relationships. In addition to police and fire organizations, the DDF is composed of many subdepartments for such services as water, medical and health provisions, transportation, electricity, planning, housing, welfare, streets, and sewer. Furthermore, within these subunits there are additional specialized divisions; for example, the provision of public bus transportation and subway transportation are handled by separate administrative units within a larger subdepartment. (Although the DDF has sometimes been referred to as the "Mayor's Office," and there is a "Mayor" it should not be equated with a single, political or governmental post. It is more properly viewed as the totality of local governmental structures and activities.)

The complexity of the DDF is further indicated, as we have already noted, by the fact that within the federal district there are 16 subgovernmental units called delegaciones. These 16 units exercise governmental authority within limited geographical areas of the

city. They are not similar to wards or precincts within American cities. They are not simply political units. They are in fact somewhat autonomous, local governmental units that provide their own services to their surrounding areas. (From the perspective of someone from the United States, Mexico City might be said to have 16 sub-City Halls.) For example, the delegaciones have their own public works, water, housing, and other departments that are controlled by them. As a result of this structure, the daily governmental activity of Mexico City is highlighted by significant decentralization at least operationally, if not formally. There was "a loosely coupled organizational system", that is, one in which authority at each level had a degree of autonomy as Weick (1976) has characterized such situations.

In understanding the organizational response to the earthquake, it must also be noted that the resources and organizational structure of the federal government itself are located within the boundaries of the DDF. The federal government also has many secretariats that functionally duplicate those at the DDF and delegaciones levels. For example, there are secretariats of health, urban development and ecology, communications and transportation, agriculture and water resources and others. As will be noted later, although the divisions between federal and district agencies with similar responsibilities may be fairly formally delineated during normal times, this independence and autonomy was considerably less during the emergency period of the disaster as tasks overlapped and resources from the federal level were also utilized to respond to the massive earthquake generated problems within the city.

Disaster Planning. With regard to the nature of disaster planning that existed prior to the earthquake, it is also necessary to make a distinction between federal level plans and those within the city. The federal government did have a plan for disasters. This was encompassed in a document known as DN-3. This plan assigned responsibility for coordination of emergency response to the Mexican Army. (There was also a parallel plan for the Navy, titled SME-3). Upon declaration of a disaster by the President, the army is to assume control of all major response actions. As indicated earlier, within the Mexican context, the army has greater involvement in Mexican civil life than is found in the United States. It is a resource of the national political system, and its control of human and material resources was a cornerstone of the federal response to earlier disasters outside of the capital city. For example, the military played a major and lead role in the federal governmental response to the volcanic eruption of El Chichonal in 1982.

Within the federal district there had been virtually no formal planning for disasters, particularly for one of the magnitude encountered in September, 1985. Certain departments and subunits, such as those within public works and the subway system, had standard operating procedures and some plans for handling

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emergencies and disruption to their own operations. However, there was no overall, system wide planning for or by the DDF.

A Civil Protection Office (SIPROR) had been discussed in 1980 and was created in 1984 within the General Office of Protection and Highway Protection under the Mayor's Office. Although this unit had conducted one earthquake drill about a year before the 1985 disaster, it was a very small unit with few resources. According to one official:

> at that time [the] organization did not have an executive, a coordinating role, and no judicial base...to operate.

Also, in 1983 a draft plan for dealing with and recovering from a major earthquake disaster in Mexico City had been prepared by a group at UNAM (the Mexican Autonomous National University), but it was never implemented by any government agency.

In sum, prior to the 1985 earthquake the situation in Mexico City could be described as one of extreme organizational complexity, a relatively decentralized metropolitan government, and limited national and very limited disaster planning at the metropolitan level. But that was alongside a massive pool of human and material resources that could be potentially employed or used in mass emergencies. Moreover, the proximate location of various federal agencies to earthquake impacted sites was vitally important, because these units were an important source of such latent resources. As we shall describe in the following pages, all of these just noted aspects would play a major role in the organizational response that was to begin on the morning of September 19, 1985.

But first so as to provide some background context we will give a very brief and selective chronology of happenings in the first two weeks after the earthquake. Our short composite listing has been primarily derived through a translation of the Spanish from two Mexican documents: (1) a chronological time listing of events in a report issued by the federal level Emergency National Commission (see the next chapter for a discussion of this ad hoc group), and (2) a chronology of social aspects of the earthquake given in the Revista Mexican de Ciencias Politicas y Sociales 32 (1986): 149-170. The times, statistics, and statements given are those that appeared in public announcements at the time, but some as we shall see are not consistent with what we found. Nevertheless, the listing should convey a general picture of the varied events that were occurring, the multiple social actors that were involved, and the public impressions that citizens and officials were getting about post impact happenings and reactions.

Brief Chronology of Selective Happenings:

September 19

7:19am   An earthquake shakes Mexico City.

7:45am   The President of Mexico gives instructions that emergency
            measures be undertaken.

            The military disaster Plan DN-3 and SME-3 was formally
            activated.

            The President takes a helicopter tour over the city.

10:30am   The President with the Mayor of Mexico City travels for
            about an hour and half through affected areas stopping
            at some of the more damaged areas in the downtown area,
            including hospitals and federal buildings.

            The President makes his first public announcement and
            states that priority ought to be given to rescuing
            survivors and sheltering the homeless, and assures the
            citizenry that the government has everything under
            control.

2 pm   There is an emergency meeting of the Mexican Federal
            Cabinet with all members reporting on damages and
            destruction within their areas of responsibility.

            The President creates a Metropolitan Emergency Committee
            headed by the Mayor of Mexico City and a National
            Emergency Committee headed by the federal Secretary of
            Government.

            An announcement from the Mayor's Office states that the
            number of injured is 5,000, that 250 buildings have
            collapsed, and that about 1,000 people are trapped under
            debris.

            The federal government reports 373 deaths and that major
            damages or destruction have occurred in buildings used
            by the Ministries of Commerce, Communication, Labor,
            Transportation, Agriculture, and others as well as the
            Attorney General's Office, the General Hospital, the
            Medical Center, Juarez Hospital and two telephone central
            offices.

            School classes in Mexico City are temporarily suspended.

            Free transportation services are provided in the center
            of the city.

Three days of national mourning are declared.

Public authorities state that autopsies of victims will be dispensed with and that identified corpses will be immediately delivered to relatives.

September 20

A report from the Mayor's Office states that deaths have reached 1,300 and that a thousand buildings have been damaged. A federal report estimates that 500 people are still trapped in debris.

A federal level National Reconstruction Fund is established which will accept contributions to be used for rebuilding.

A special federal Multidepartmental Commission to investigate the consequences of the earthquake is established.

The Department of Works estimates that the number of severely damaged buildings in the Federal District is about 400.

7:38pm   A second earthquake impacts Mexico City.

The President for the first time directly addresses the nation with a public message indicating the affected areas and that there were no precise figures concerning material and human losses. He states that "unfortunately I must admit such a tragedy has overwhelmed us in many cases. We cannot do what we would wish to do as quickly as we would wish, especially to save lives...the truth is that we do not have the necessary resources to face such a quake to respond effectively and promptly."

It is announced that unidentified bodies will be given mass burial and that 880 death certificates have so far been issued.

September 21

The Mayor's Office announces that 760 buildings have been damaged with 411 suffering total destruction of which 112 were government ones.

A federal agency states that there have been 2,250 deaths.

The Seguro Social Park in Mexico City is prepared for use as a morgue, especially for unidentified bodies.

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The President cancels his scheduled trip to the United Nations in New York, and in a message states that "the activity going on now is immense, we have many fronts to cover and I realize that there is a lack of adequate coordination."

The telephone company announces that it will provide free service at 12,000 telephone call booths in the city.

The service established to locate missing persons, LOCATEL, declares that it has received 32,000 inquiries up to that time.

A report given to the President and the Cabinet states that earthquake affected areas outside of metropolitan Mexico City had enough local resources to handle their problems.

September 22

The Metropolitan Emergency Commission establishes 13 subcommittees and gets an executive coordinator.

It is announced that there are 26 public shelters housing 3,300 homeless.

The Red Cross declares that it has received 2,600 bodies in Seguro Social Park of which 96 percent are unidentified.

The Multidepartmental Commission prepares a document proposing the freezing of rents, locating housing not being used and giving them to victims, and suspending eviction cases.

Delegates of the Unified Socialist parties of Mexico at a meeting demand legislation concerning an urban reconstruction plan.

The 34 organizations in the Congress of Labor propose that union members donate one day's salary for earthquake victims.

September 23

A federal agency states that there have been over 3,000 deaths, 6,500 injured and that 1,500 victims are still thought to be trapped in debris.

It is announced that classes have been indefinitely suspended in 152 schools.

A Cabinet Minister declares before the federal Multidepartmental Commission that the national government of Mexico is developing a program of urban reconstruction.

September 24

A labor union leader denounces the existence of corruption in the granting of construction licenses.

Employees of UNAM (the University in Mexico City) give three days of their pay to the Fund for National Reconstruction.

The President states that the earthquake will complicate the management of Mexico's foreign debt. He meets with the Mayor of Mexico CIty to study the plans for reconstruction of the capital city.

There is an official and public denial by federal agencies that there is any danger of epidemics as a result of the earthquake.

September 25

The Metropolitan Emergency Commission states that 3,286 have died but that 80 percent of the recovered bodies have not been identified.

The Ambassador of the United States to Mexico publically estimates that 10,000 people have been killed and that reconstruction costs will be more than a billion dollars.

September 26

The Metropolitan Emergency Commission states that there is no possibility of finding further survivors in the debris.

A group of victims demonstrate in front of the National Palace.

The Confederation of Workers of Mexico indicate that each member will work one hour each day without compensation with the effort being contributed to the Reconstruction Fund.

September 27

About 4,000 demonstrators in the center of Mexico City complain about lack of governmental help for victims of the earthquake.

Federal agencies indicate that 200,000 workers in the metropolitan area are still unemployed because of damages to their work places.

The Metropolitan Emergency Commission denies that industrial plants have been seriously damaged by the earthquake.

September 28

Almost all search and rescue teams from foreign countries return home.

September 29

The President prohibits the use of explosives in building demolitions so that the search for buried survivors can can continue.

The National Emergency Commission present a general report about recovery activities undertaken since the earthquake. It states that highways, railroads and telegraph offices in the metropolitan area are functioning normally, and that the electric and telephone services are being restored.

It is reported that international help has been received from 43 countries.

September 30

The Metropolitan Emergency Commission announces that the grounds of many destroyed buildings will be converted into parks and gardens.

An Evaluation Committee is established at the national level to ascertain the causes and effects of the earthquake.

Some suspended elementary school classes in Mexico City are resumed.

October 1

A Popular Committee of Solidarity and Reconstruction made up of more than 68 political organizations, labor unions, student groups, etc. is created to provide aid for victims.

An official Technical Committee for managing the federal National Reconstruction Fund is established.

A formal plan for an Emergency Housing Program for displaced earthquake victims is presented to the President of Mexico.

October 2

Workers of more than nine textile factories organize themselves in a group to claim compensation for losses they have suffered from the earthquake.

A march involving thousands of citizens in Mexico City held to commemorate the student movement of 1968 which was suppressed by the national government also takes up the question of help for earthquake victims.

October 3

The President directs a message to the nation thanking citizens for their help after the earthquake and calls for continuing participation in the National Reconstruction Program.

The Metropolitan Emergency Commission states that 2,381 buildings had been affected, including 123 government buildings, 49 health centers, and 1,133 private residences.

A National Reconstruction Commission is established.

The President established a Supervisory Committee of Donations to monitor the providing of help given to victims.

CHAPTER 5.

ORGANIZATIONAL RESPONSE IN THE EMERGENCY PERIOD

In this part of our volume, we shall focus on the activities of various governmental and private organizations as they attempted to respond to the demands created during the first two weeks after the disaster. For descriptive purposes, we will divide that time period into two segments: (1) The first three days after impact and (2) the remainder of the fortnight. In this chapter we will describe the organizational response in the first three days. In the following chapter, the later emergency time period organized activities will be depicted, as well as some specific task-related problems.

The first violent earthquake disrupted in a major way a normal, early Thursday morning in Mexico's capital city and launched a massive organizational and individual response to the emergency. In discussing the nature of this response during the first three days, we will make a rough chronological presentation of some major decisions, activities, and problems. The picture that will emerge is one of a very decentralized, but intense, pattern of organizational activity.

At one level, the response can be characterized as lacking coordination, involving duplicative efforts, and resulting in some organizational conflict. Interestingly, some of our Mexican informants stated that there also appeared to be a substantial amount of social "chaos". Certainly for some organizations and groups, particularly as seen by officials at middle and lower levels of organizational response, such a description of what was happening might seem manifestly true. But as we shall discuss later, while much of the response was certainly ad hoc in nature and was not based upon prior planning, it was not chaotic in any meaningful sense of the term.

In fact, at another level the response did involve extensive and effective activities by a number of federal and district agencies as well as those from delegaciones. Many of the actions were undertaken relatively autonomously and independently of what other groups were doing. However, within these involved organizations there was sometime the development of internal coordination through time. Furthermore, there were also pockets of interorganizational integration among some of the responding groups. Therefore, any depiction of difficulties of coordination must not obscure the extensiveness and intensiveness of organizational activity, as well

as the massive individual coping and helping behavior that will be discussed in Part III of this report.

The organizational response of the Mexican public and private agencies was not only massive, but also complex. Within the public sector, agencies and departments from the national, federal district, and delegaciones levels were involved. In addition, a great variety of private agencies, businesses, and voluntary organizations also launched major activities, and new citizen groups also appeared on the scene. Furthermore, millions of individual and group volunteers concurrently launched a mass assault on the problems of immediate search and rescue, casualty care, and providing aid to the victims. The Mexican government additionally had to respond to more than 250 offers of aid from foreign governments, international agencies, and nongovernment organizations (Quake Highlighted, 1986: 7). In order to better understand the nature of the response during the first three days, it is important to keep in mind the complexity of this multiple assault upon earthquake generated problems.

Initial Governmental Actions

Within a few hours after the initial earthquake of September 19, the President of Mexico along with the Mayor of Mexico City visited some of the more affected areas. He also received some reports, which though incomplete, indicated that there had been substantial damage in various neighborhoods, but especially in the downtown area. The President then ordered that the highest priority be given to search and rescue for victims, and the caring of casualties including the handling of the dead.

Also, within the first few hours, the national disaster plan, DN-3, started to be implemented. The Secretary of National Defense, under the authority of the plan, and responding to information from 25 out of 36 military zones about damages suffered in those areas, began to mobilize army, marine, and navy units to respond to the earthquake (although some elements, because of where they were situationally located, got immediately involved in informal search and rescue prior to the formal implementation of the plan). One unofficial report indicates that in this early stage in Mexico City about 4,100 soldiers were mobilized along with 25 ambulances, 500 trucks and 600 motorcycles as well as other equipment (Opera el Plan DN-3, 1985: 7). In addition, about 2,000 marines were sent by the Navy to several impacted sites (Perez, 1987: 5).

However, after at least three more Presidential helicopter and bus tours of affected areas and discussions among very high national governmental officials, it was soon decided that there might be limitations and problems to the implementation of the DN-3 plan in the capital city itself. Part of the reasoning appears to have been that giving full responsibility to the military for responding to the disaster was not feasible in the case of Mexico City; the

sheer magnitude of the problems, the volume of needed resources, and the complexity of coordinating a massive organizational response in a vast metropolitan area was rather different than if the earthquake had impacted a rural area or small city.

Also, according to some sources, perhaps the complications for civilian authority that might result from having the military assume control in the capital city played an important role in the decision (for a discussion of some Mexican perceptions about the unwillingness of the civil authorities to turn the emergency response over to the military, see Zinser, Morales and Pena, 1986: 105-112; see also, Robinson, Franco, Castrejon and Bernard, 1986: 113 which suggests that there was an intense dispute at the federal cabinet level between the military and civilian politicians over the full implementation of the DN-3 plan).

The role of the military was soon restricted in Mexico City to initially providing security and crowd control at rescue sites; later soldiers were also used to make damage assessments. But outside of the capital city, the DN-3 plan was implemented in impacted localities such as Jalisco where the military organized the relief effort, set up camps, provided medical facilities and distributed meals (Palacio, 1986: 32). As of September 20 the Secretaries of Defense and Navy announced that more than 50,000 personnel had participated in the response effort up to that time.

Whatever the prime or major reason, the general direction of the emergency response in Mexico City was not given to the military. Instead it was lodged within a new, ad hoc, emergent entity consisting of two multidepartmental commissions under civilian control. Eventually responsibility for overall coordination of emergency response within Mexico City was placed within the Mayor's Office in the DDF.

Two ad hoc coordinating committees were created by the President during the two days after the disaster. First, on September 20, he established the National Emergency Commission (CNE) and appointed the Secretary of Government (Gobernacion) to be its chair. The CNE was composed of representatives from the Secretariats of National Defense, the Navy, Foreign Relations, Health, Education, Communication and Transportation, Planning and the Budget, and Urban Development and Ecology. It also included a representative of the DDF. This commission was intended to coordinate the governmental response to the earthquake in areas outside of Mexico City.

Second, a Metropolitan Emergency Commission (CME) was also established. It was headed by the Mayor of Mexico City and centered within the DDF. This commission was authorized to coordinate emergency operations within the federal district. The commission was divided into a number of task related subgroups, such as those for inspection and evaluation of buildings, medical

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and health services, public safety and rescue, heavy equipment for rescue and demolition, supply of basic products, shelters, feeding and donations for the public, legal matters concerning the dead and damages, hydraulic services, urban services, collective transportation, etc. Furthermore, representatives of a variety of federal level agencies, including the Secretariats of the Government, National Defense, Navy, Planning and the Budget, Agriculture and Water Resources, Education, and Communication and Transportation were also appointed to the CME. As formally delegated, the DDF was to be in charge of the emergency response, with the Mayor's office assuming overall direction.

A number of observations regarding this emergent disaster management system may be made. First, it was not until after about three days that both committees were actually operating, which limited the effectiveness of the CME in coordinating certain early response measures, for example, the initial organized search and rescue activities. Second, the complex relationships between the federal and metropolitan levels can be seen in the inclusion of representatives from both segments on both committees. Third, partly due to the lack of prior disaster planning by the Mayor's office, the response was inherently ad hoc in nature. It was also contingent upon responding to situational events, given the lack of prearranged strategies or established patterns of authority for interorganizational linkages.

Apart from the lack of any prior civilian disaster planning, the ability of both the federal government and the DDF to perform a major coordinative role during the initial emergency period was impeded by a number of factors.

First, many governmental buildings were destroyed or badly damaged. For example, the Secretariats of Budget, Communications and Transportation, Labor and Welfare, Agriculture and Water Resources, Commerce and Industrial Development, and the Navy as well as the attorneys for the DDF and Consumer Affairs all had buildings destroyed in which they had offices. Other units, such as the Secretariats of Government, Urban Development and Ecology, Health, the Mexican Institute for Social Security, and CONASUPO also suffered damage to their office structures (Perez, 1987). In fact, one estimate is that 120 government agencies lost all or part of their facilities including files used for everyday operations. Therefore, during the initial part of the emergency period, considerable attention had to be given by these agencies to simply assessing their own damages, aiding their employees who were victims, and procuring or salvaging resources.

Second, the critical tasks of damage assessment and early information collection were hindered by the diffuse nature of the event, the massive destruction of property, the difficulty of movement through debris strewn areas, and the disruption of the communication system. As a result, relevant information could only

be gathered with great difficulty and an overview of the level of destruction and critical areas for response was not obtainable in the initial period of the emergency. Such information, of course, is critical if efficient mobilization and integration of response activities is to occur.

Therefore, during the initial three days of the event, both the national government and the DDF were involved in the difficult processes of gathering information about damages and problems, and developing an emergent structure to pull together the overall emergency response. By the third day the structure was in place. The CME established an Emergency Operations Center (EOC) at the National Palace. Each evening, representatives of the various DDF and federal agencies would meet and present reports on actions taken and plan for future activity. These meetings were held throughout the emergency period.

However, it must be noted that this EOC was not similar to the type of arrangement found in the best prepared communities in the United States (see Wenger, Quarantelli and Dynes, 1986). In other words, it was not a facility that was staffed "around the clock" with representatives of various responding agencies and in which communication and decision-making were coordinated. A number of responding governmental groups, such as PEMEX, Public Works and the transportation agencies did have typical 24-hour EOC's for coordinating their own, internal response. But no such arrangement was established at the federal level to provide continuous supervision and integration of the ongoing activities.

Initial Response of Organizations

Although the DDF required two to three days to develop a structure to coordinate the response, it does not mean that no collective and individual responses to the disaster were taking place during that time period. They were occurring extensively. Millions of volunteers and hundreds of public and private organizations launched a mass assault on the human and social needs and demands created by the earthquake. The foremost issues and problems confronting the responding groups during the first three days included the more formal undertaking of search and rescue, the delivering of emergency medical care, the giving of emergency shelter, the providing of food and especially water to residents of the city, the carrying out of damage assessment, the maintaining of security of property, the controlling of traffic and crowds, and the handling of the dead.

With the damage spread across a wide area (even though there were certain points of extreme concentrated destruction) literally thousands of sites required attention. Necessarily therefore a great deal of the response was situationally specific. Given the lack of planning at the local level for an event of this nature, organizations and individuals initially set themselves to attending

to the immediate problems present in their own immediate areas, almost to what they could literally see before them. Furthermore, public agencies and departments with traditional domains and responsibilities also had to ascertain the condition and needs of their own operations, before they could concern themselves too much with what was happening outside of their own groups.

Because of the diffuse and response specific nature of the organizational activity, it is somewhat difficult to generalize about the experience of the various organizations. While the lack of overall coordination of the response affected all organizations to a degree, it was particularly pronounced for some, while other groups and agencies managed to engage independently and without serious difficulties in earthquake related tasks.

In order to provide a sampling of the varied response activities that were generated during the first three days, we will briefly depict the actions of a few organizations. These short descriptions are offered only as examples of the nature of the tasks and the types of problems that were occurring for the immense number of responding groups. Since we were primarily interested in the activities of the "Mayor's Office", and it involved multi group activities, we will first describe in most detail the response within one delegacion. Then we shall depict the response pattern within a major service sector, those involving the lifeline organizations. We then briefly describe the emergency time response pattern of one major organization with numerous subdivisions, PEMEX. We conclude with a very selective summarization of what a variety of other individual public and private groups did in the first 72 hours after the initial earthquake.

It should be noted that while our focus here is on group behavior, many activities by individual volunteers and actors were often intermingled with the organizational actions. In addition, all of the organizations we discuss undertook some new emergency time tasks and extended their work activities into nontraditional areas. Furthermore, as already noted, only limited intra and inter organizational coordination was ever achieved. Nevertheless, most of the important disaster generated emergency tasks were relatively effectively, if not efficiently, handled.

a. The response at the level of the delegaciones.

The one delegacion we will describe was located in one of the most severely damaged areas of the city. When the staff workers arrived at their offices on the morning of September 19, they had little comprehension of the magnitude of the destruction or the degree of activity that was necessary. One of the first tasks was the acquisition of information, primarily through damage assessment. As one staff member said in an interview:

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> We organized ourselves and volunteers into
> brigades to go and bring back information about
> what had to be done. But when the brigades came
> back, the information we received was of duties
> that were impossible to carry out; there was
> simply too much to do. The sub-delegacion of
> Works went out with their trucks and shovels,
> but it was overwhelming.

This damage assessment task was made difficult because of the lack
of interaction and information from other agencies and groups. At
first, this delegacion was informed that the DN-3 plan would be
implemented.

> I wondered what had happened to the DN-3 plan.
> It was the second day, and still no one had
> come. We were told to relax, that the plan
> would go into effect, and that their people
> would come, but they did not. I don't think
> people even knew about the plan, or maybe they
> thought it was already in effect. Anyway, no
> one came.

The problem of a lack of any integration of a vertical nature (that
is, up and down between organizations at different levels) with the
DDF was fairly severe during the first two to three days. For
instance, on the evening of the first day, a group of men with
communication equipment did arrive to establish a link for the
delegacion to the DDF. But this did not lead to any actions by the
group that came as a result of policy making or directions from
higher levels in the organization of which it was structurally a
part. As one respondent in an interview noted:

> There was no coordination with the Department.
> On the first two or three days the delegacion
> was not able to carry out its duties, but the
> DDF did not take over, either. There was a
> complete absence of a line of authority or
> coordination. Supposedly by that time the DN-
> 3 plan should have gone into effect, a desk
> established for sending out directives, a camp
> of action, a hierarchy, and there was none. So
> many of the efforts were in vain, because
> everyone---like a hundred institutions,
> education, universities---went out to the
> streets doing things without any direction.

But while this was the expressed perception, they were in fact
doing very relevant things. Within this delegacion, for instance,
the workers commenced a number of important activities. Public
works personnel were involved in rescue and debris clearance.
Those from the water department worked at inventory and repair of

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the system. The building housing the delegacion was used as a temporary morgue. The staff began the collection and distribution of food and relief supplies. Shelters were established wherever victims gathered. A census of the affected population was started.

One task, that of developing a list of missing and dead persons, proved very difficult. It eventually took the delegacion a number of weeks to complete the list. It was also a task beset with problems and hindered by the lack of linkages across horizontal boundaries, that is from one organization to another organization. For example, workers from the delegacion were denied access into areas by army personnel who had cordoned the most severely damaged locations. Staff members even were not able to gain access to LOCATEL (the missing persons bureau). Somewhat imaginatively, they circumvented this problem by disguising themselves as stretcher bearers and gaining access to the restricted areas to carry out their census.

With regard to the other tasks, the problems experienced were similar to those found in most other disaster settings. The compounding influences in Mexico City were a lack of official information and an absence of formal integration of various activities.

> The information I had, I received from the radio. I got hold of a radio, because it was the only thing to do...We had an enormous difficulty with communication and the movement of vehicles. On one side, vehicles were not being permitted to pass. On the other side, vehicles could not pass because of fallen buildings. So there were many areas, houses, buildings, where help was truly needed. But there was no census really to say which were the requirements for salvage. Some areas went for many days without having a brick turned over.

> Many shelters were established and it was difficult to maintain a census of just how many shelters there were because all kinds of church groups and organizations were offering their good will, offering their churches, schools, sanitariums, whatever, as shelters. One morning we woke up with 42 shelters, and in the afternoon there were 272!

In undertaking the task of shelter management, this delegacion assigned the duty to social workers who in turn attempted to integrate the activities at the spontaneously established shelters. Volunteers, who were not working on the census of missing persons, were placed in the shelters to live there and coordinate the

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feeding, monitoring the sanitary conditions. etc. Through the first three days, the delegacion attempted to consolidate the many spontaneous shelter arrangements that had emerged into a few major centers located at community and sports centers.

A massive convergence of supplies and personal upon this delegacion also presented some problems. Unsolicited aid such as food, clothing and medicines poured quickly into their office. As one informant noted, within hours the goods were stacked three meters high in the auditorium. The medical services division of the delegacion was placed in charge of making an inventory and distributing the goods. They were assisted by many individual volunteers. But the effort was basically uncoordinated.

> One minute we would have no food, and the next it was piled so high that we couldn't store it. We would distribute it immediately to an area, and when we arrived to give out the food, other private agencies would be there. There was no coordination of this activity during the initial period.

> We never really had a shortage of food. In fact, it was the opposite. Tons of food arrived from restaurants, institutions, whatever. The shelter people would come with a truck of food, and in an instant, there would come another truck. People just took what they needed.

The delegacion was also inundated with volunteers, a common problem in many disasters. In this case the major difficulty was in determining who might be useful, what skills they possessed, and how they might be utilized.

During the initial emergency period, this delegacion did receive aid from personnel from five other nearby delegaciones that had not been as severely damaged. However, even this needed assistance resulted in problems between previously autonomous units.

> On the second day, people from other delegaciones, where nothing had happened came to support us. Apparently, they were ordered to come by the DDF, but it was difficult, because we did not know each other. The rest of us had been working together. They were asking what to do, where is this and that? The help was not very defined with regard to equipment or personnel. There was little order or chain of command.

There were some instances of linkages with other groups at the same horizontal organizational level. For example, in undertaking the census, the delegacion was assisted by representatives of a university. However, such kinds of contact was generally absent.

The only semblance of vertical integration (communication or interaction up and down within the same organizational structure) with the DDF was what we had described earlier: the arrival on the first evening of a team of communication personnel. However, they arrived without prior notification and simply proceeded informally to set up in the building. The workers of the local delegacion did not know who they were, or what their major purposes was, except that they did provide a linkage to the outside world.

The officials and staff members of the delegacion were not aware of a formal declaration of a state of emergency until they heard via mass media reports a statement of the President of Mexico. He asserted that control of the emergency response would reside with the DDF; only then did they clearly understand where the responsibility was being given. Of course this lack of knowledge had not hindered their prior undertaking a number of difficult and important disaster related tasks.

In summary, this delegacion engaged in an intense ad-hoc pattern of responding during the emergency. They also did so during the first two to three days without the aid of either prior planning or centralized coordination from the DDF. In terms of both their vertical and horizontal operations, they generally were autonomous from other organizations. The important matter of providing shelter, food, rescue, water supply, damage assessment and census taking was vital to the residents in their own delegacion. However, this group was not part of an integrated organizational response system, and its members were not able to coordinate its activities with those of related organizations.

b. Response of lifeline organizations.

The earthquake had a pronounced differential effect upon one sector, that involving the various lifeline organizations.

For some organizations, such as the telephone company, the damage and disruption were severe. The main building of the system partially collapsed. About fifty trunk networks were extensively damaged, and 750 multiplex equipment units were destroyed. Also, six operations centers for long distance operations, six buildings, and all manual operation centers were rendered unusable. In addition to losing all national and international long distance lines, 14,500 local lines were cut (Bohlen, 1986: 11).

Similarly, electricity was lost to nearly half of the city after the first earthquake. Over 800 transformers, 28 kilometers of high tension lines and 32 kilometers of low tension lines, were damaged.

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For these lifeline organizations, their primary response was limited to a massive effort to restoring their own system. In some cases the response was notably effective. For example, electrical service was restored everywhere within 72 hours except to the most severely damaged areas of the city.

The water system also suffered significant damage. The Chalco-Xochimilco aqueduct which supplied about half of the water to the city was lost. Fifteen thousand of leaks were formed in the piping system, 80 in the primary water networks and 1,420 in the secondary network (Perez, 1987), and water distribution was lost in the most heavily damaged areas of the city. As we will note later, nearly 40 percent of our sample reported interruption of their water supply.

Other lifeline organizations fared much better. There was no significant damage to Mexico City's highways, railways, ports or airports. Bus service was disrupted in about 40 percent of all routes, due to debris clogged streets, and about 300 buses were destroyed or damaged, but generally full service was restored within a short time. The subway system suffered very minor damage and was operating at close to full capacity within six hours and was fully operative by the second day.

The activities of all lifeline organizations during the first three days had a number of common characteristics. First, there was a massive and complex response involving organizations from the federal, district, and local delegaciones levels. While there was some coordination of activities across similar lifeline agencies who normally interact during their day-to-day operations, during the initial period the agencies tended to act autonomously. For example, there were instances of workers from the federal, district, and local levels all appearing at the same site to repair the same damaged water pipes.

Second, the initial response of all the organizations involved damage assessment, information gathering, and an attempt to restore as much service as quickly as possible. For those lifeline groups that were the most severely disrupted, these tasks dominated their concerns.

Third, many of the other lifeline organizations---those less impacted---extended their emergency activities into areas that were not part of their traditional domain or usual functional responsibilities. They became involved in such tasks as undertaking search and rescue, providing emergency aid, distributing potable water, and assisting in debris clearance. Possessing large numbers of personnel and equipment, they rapidly became involved in nontraditional tasks. This extension of activities was particularly pronounced for such lifeline organizations as the subway system, the department of transportation, and the public works and streets departments. Also

involved were federal level agencies, such as the Department for Public Works in the Secretariat of Agriculture and Hydraulic Resources.

Fourth, although there was not a city wide EOC operating on a 24 hour basis to integrate overall activity, internally most of these agencies established command centers to coordinate the response of their own organizations. For example, the Department of Urban Transportation within the DDF established an EOC within the first two days, as did the subway system and others groups.

Typical of the types of activities and problems that were occurring for these organizations can be seen in such agencies as the Public Works division of the Secretariat of Agriculture and Hydraulic Resources. Immediately after the initial earthquake on September 19, brigades of workers including administrative and support personnel were informally created in the Public Works division for search and rescue activities, the transportation of victims, and other related tasks in the immediate vicinity (as we shall discuss later these brigades in most cases were informally formed and were not the result of prior planning or even formal bureaucratic requests at the time). Soon, the organization was requested by their Secretary to evaluate damages, a task which took place for the first two days. In addition, they were asked by their agency to supply potable water to people in the most severely damaged areas. None of these tasks were part of their normal duties.

The situation was described by one informant in the following manner:

> These tasks were very difficult at the beginning. First, we were asked by the department to evaluate damages, and that took up much of the 19th. Many of our people were already working on various rescues, helping people. Then, we were asked to supply water. We don't normally do that. We only have five water wagons, and we used them to supply water to hospitals and refugees. We had to contact private companies and ask for their help. Eventually, we were able to get 92 wagons.

The emergent nature of the action was described by another informant as follows:

> During the first two days, everything was absolutely spontaneous and improvised. There was no coordination, just spontaneous help. For the first two days, the situation was close to chaos. However, by the third day things were getting organized.

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On the third day, the Secretary gave instructions regarding task allocations to each of the departments. The Public Works division was assigned the task of receiving materials and equipment from other private and public agencies. They also coordinated a mass flow of volunteers, designated 20 specific work sites, and allocated personnel and equipment to engage in rescue and debris clearance. Additionally by the third day, 92 water wagons had been secured and a more coordinated system for supplying water was established.

Also on the third day, the Public Works division contacted the DDF and identified the priorities for their tasks and began to coordinate their activities with DDF personnel. In addition, they developed contacts with such other organizations as the United States Embassy (which provided needed equipment), and the University of Mexico which monitored the water quality in the mobile units. The Water Commission of the State of Mexico was given some equipment; it also divided the city into areas in which each organization would provide water.

In carrying out these emergent tasks during the first three days, the agency faced three major problems. First, given the lack of prior disaster planning, the response was ad hoc, spontaneous and emergent. Second, they had numerous equipment failures. Third, they had difficulty in handling and integrating the massive influx of volunteers. As noted by one informant:

> The arrival of people and volunteers was enormous, but it turned out to be a source of difficulties for us. People started pouring in from all different states, and they came without tools or equipment of any kind. Before they could be assigned and sent to a post, providing them the food and equipment they needed, proved to be very problematic for us.

Other lifeline organizations extended their activities into similar nontraditional areas. The subway system, which is part of the DDF's Department of Transportation, initially turned its attention to restoring its operations. The metro system received relatively minor damages. Most of its trains in service at the time of the earthquake were able to reach stations, and within hours it was operating at near peak conditions. By the second day this organization turned its attention to other emergency tasks. As one official said:

> Then we dedicated our efforts to other aspects. We organized all our technical and professional people so that we could evaluate civil works, such as bridges and buildings. We provided a group of architects and engineers to other organizations.

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Unlike the Department of Public Works from the federal level agency of the Secretary of Agriculture and Hydraulic Resources, the metro system did have contact and some linkages with other units of the DDF. Through the Department of Transportation, they initially made contact on the afternoon of the first day with the Secretary of Government of the DDF. Information was exchanged and tasks were discussed. However the major coordination that did occur took place within the EOC of the Department of Transportation. From the third day until the end of the emergency period, representatives of the metro system served on the CME.

In summary, it can be said that the lifeline organizations were especially important in the organized response pattern during the first three days after impact. Possessing large amounts of needed resources and skills, they were able to extend their activities into nontraditional areas. Although overall coordination of search and rescue, debris clearance, casualty care, and the provision of water and food was not achieved during this period, through time, pockets of integration between units and intraorganizational coordination did develop. Most importantly many disaster created demands and needs were met in a relatively effective manner.

c. The response of PEMEX

PEMEX is the national petroleum company of Mexico. It is a massive organization, employing thousands of personnel and possessing voluminous resources. Having found through a quick initial inventory that it had suffered no major damage to either its equipment or production capacity, PEMEX assumed a major role in the immediate post impact period of the earthquake. It was able to mobilize over 5,000 workers and engage in a variety of emergency tasks, particularly those of search and rescue and of sheltering. Furthermore, it undertook these activities with great autonomy and limited its interaction with other organizations to the development of some contacts with the Army.

The initial request for a PEMEX response came from a hotel. At first, the company officials felt that they were not authorized to assist in such nontraditional work tasks as search and rescue. But within two to three hours the magnitude of the disaster became apparent, and the decision was made to mobilize PEMEX'S massive resources to aid in the response. The Director of Projects and the Director of Security for PEMEX coordinated the response. As an official of PEMEX said:

> We began to organize a system of aid. We checked to see what supplies we could get right away. We contacted the superintendent, the ministers and their supply houses so that they would provide us immediately with an inventory or equipment, mainly cranes...We decided at that time

that the most important thing was to extract the greatest number of live people.

In undertaking these initial tasks, PEMEX partly coordinated its activities with the Army. Primarily this involved the Army requesting PEMEX's help, and PEMEX proposing that all search and rescue projects have army representatives to account for recovered money, extricated bodies, found properties, etc. Even this interaction presented some problems of coordination during the first two days.

> I think that during the first two days there existed an emergency in which you could say...there was disorganization, and anguish. This was true both in our relationships with the Army and internally. You see, whenever the army needed an action from us, they would get in touch with our security chief and tell us. But there was much disorganization and lack of coordination. Why? Because there had never been a chance to work in a situation like this.

Although it continued to work with the Army, PEMEX decided it could most effectively work independently from other organizations.

> I thought that we [PEMEX] could organize in a self-sufficient way with well placed work crews...that [situation] allowed us to organize the work teams, machinery, personnel, feeding of workers, lodging, etc. So we contacted the Army and asked them to consult with us at different work sites.

An EOC was established at PEMEX headquarters and emergency communication equipment was installed. A map of damaged areas was constructed, and PEMEX decided to focus its rescue activities on 24 major sites, including such important buildings as the very heavily damaged Juarez Hospital and the General Hospital. A map was used to divide the city into four sectors. Within each sector, one PEMEX supervisor was placed in charge of field operations. Each sector also had one coordinator in charge of the number of sites or "fronts" at which PEMEX worked in rescue and debris clearance.

Within two days, about 5,000 organizational personnel were mobilized from the city and from neighboring states. Arrangements were made for housing and feeding the workers. The medical staff of PEMEX provided medical aid to the rescue workers operating out of the various sites.

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In addition to carrying out search and rescue tasks, PEMEX, through the Union of Petroleum Workers, also established and managed two major shelters for the victims. One was set up at a college building and at one of the refinery facilities. Food and materials were provided by PEMEX. The staffing of the shelters was managed by the union workers. The shelters operated for only a few days before the residents went to other shelter sites supervised by the DDF.

In a relatively short period of time, a rather elaborate emergency response team emerged within PEMEX. After the first two days, architects, construction supervisors, doctors, security personnel, and workers were organized into a very autonomous unit.

Autonomy certainly epitomized the response of PEMEX. Except for their relationship with the Army, the company worked by itself. One top official explained the advantage of this type of arrangement for the organization:

> When we know the resources that PEMEX has, we tend to want to be self sufficient. That was one of the proposals put forth to the director, i.e., that so we don't work in a disorganized fashion, and so that we can accomplish specific tasks, nobody should get in the way. That might sound a bit lofty, but that's the way it seems. Because, we see other institutions as very disorganized, not knowing what to do and they do not have our resources...up to the point that Telmex de Mexico called us to find certain tools because they had problems with their requisition equipment. But, we really didn't coordinate with others.

Apart from the Army, the only major interaction PEMEX had with either the DDF or other elements of the federal government was to meet twice after the first two days with the DDF to inform them what PEMEX was doing. Representatives of the company also had a similar meeting with the President of Mexico. This lack of communication, contact, and coordination with other groups, while obviously perceived to be beneficial to PEMEX, was also noted by an official has having negative consequences:

> I think that is bad [the lack of coordination and integration]. Because a system should be demonstrated that, in another situation of emergency, could be implemented quickly so that we all could collaborate.

PEMEX extricated over 1,000 bodies from the rubble and claimed to have rescued over 400 living persons. Basically, the company operated by itself, and was left alone by others. Due to its

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massive resources, its visibility and legitimacy within the nation, and its ability to structure an effective internal organization, it provided a valuable service to Mexico City.

d. Response of other organizations.

The hundreds of other responding organizations and the millions of volunteers launched their mass assault under the conditions we have previously discussed, namely a lack of prior planning and overall coordination. Organizational behavior ranged from maintenance of traditional structures and tasks to development of new structures and/or tasks. For purposes of illustration, we shall now briefly note the impact time activities of some formal emergency oriented agencies and groups.

Some of the traditional emergency oriented response organizations continued to engage in somewhat normal tasks. The Federal District Police Agency, for example, had about 20,000 members, 2,000 patrol cars, 1,500 motorcycles and a standby unit of 500 officers who can be quickly dispatched to any emergency site. However, the police generally limited their activities to traffic and crowd control (and to some extent sharing the security of damaged sites with the military). It is of interest that the police reported that in the days following the earthquake there were fewer traffic accidents than usual and to a lesser extent somewhat less traffic congestion because drivers drove more carefully than usual (and possibly also because free subway transportation was provided between September 19 and October 23).

The Fire Department of Mexico City is part of the Federal District Police Agency. It is very small--only 800 members--for a city of the size of Mexico City, because given the nature of building construction in the city, there are relatively few everyday fires. For example, the fire department usually has about 3,000 runs per year, compared to over 30,000 in some large American cities. Relatively few fires resulted from the earthquake. Although over 300 fires were reported during the first three days, a high ranking officer of the department noted that there were only about seven or eight major fires on the first day or so. Therefore, the fire department also was available to extend its activities into the rescue and the transportation of victims, which it did for about eight days. In using civilian volunteers for rescue tasks, one firefighter was assigned to supervise the work of such teams.

Similarly, the Mexican Red Cross also engaged in traditional tasks although it did somewhat extend its regular structure. It was one of the major organizations involved in rescue and relief work. It established 12 first aid stations and provided doctors in over 50 ambulances. During the first day these operations treated over 1,000 victims. These augmented the normal four large and 18 smaller permanent medical centers run by the Red Cross throughout the city. Furthermore, it became involved in the collection and

distribution of food and clothing to over 60 shelters. However, in carrying out these tasks, the Red Cross worked fairly autonomously from other agencies and governmental units.

Some other organizations indirectly provided the personnel for nontraditional activities. Almost all non-emergency governmental and many commercial organizations were closed during the first three days. Many of their employees became individual volunteers, doing the tasks we will discuss in more detail later in Part III. In addition, there were a large number of group volunteers. That is, their helping behavior was part of a group or collective endeavor. They volunteered as members of a variety of public and private organizations, unions, student groups, and neighborhood associations. (For the distinction between individual and group volunteers, see Dynes and Quarantelli, 1980).

Given the lack of planning and coordination during the initial period, some degree of interorganizational conflict would have to be expected. Such conflict did emerge. Much of it centered around problems of access to secured areas and disagreement over response goals by volunteers, private agencies and various officials, particularly the Army. As one official said:

> there were incidents many times, due to people
> disregarding security precautions who wanted
> to salvage their belongings, and from technical
> problems of the rescue effort.

For example, at the rescue site of a major hospital, personnel from the hospital and volunteers clashed with Army personnel who attempted to bar entry into the site. Given the absence of an agreed upon pass system among involved organizations, many volunteers were denied access. Furthermore, strong overt disagreements developed over the perceived priority given to the apparently contradictory tasks of rescuing survivors and debris clearance. However, not all of the clashes resulted directly from the disaster situation. There were instances of disagreements between members of some trade unions and the civil authorities which were clearly carryovers from preimpact differences of a political nature.

Clearly the first several days after the earthquake posed a difficult situation within which organizations had to operate. There was a great deal of uncertainty about losses and problems. As groups accepted new tasks or new personnel, or both, much organizational diversity was created. There obviously was a substantial decrease in formalized ways of doing things. Only very limited intra or interorganizational coordination of any kind was achieved. Decentralization of decision making often occurred.

Role Behavior of Organizational Personnel

The social environmental uncertainty for organizations however did not lead to paralysis of actions. It is sometimes thought that officials will fail to act in very stressful situations because of one of two possibilities: they are stunned by the dramatic happenings around them or they give priority to actions involving their own family members. There is little evidence in our data of either of these two factors becoming operative in the Mexico City earthquake. Officials, while surprised and sometimes awed by the earthquake consequences, were not psychologically incapacitated by what they experienced. While the word "panicky" was sometimes used in describing reactions, it is clear that the term was employed in a non-technical sense, that is, that people were frightened, not that they manifested dysfunctional personal behavior. Neither did officials show much "role conflict" that prevented them from carrying out their work roles because a "family first" orientation developed. Such behavior is consistent with what has been reported for many other disaster situations (e.g., for the usual lack of panic see Quarantelli, 1981; for absence of behavioral role conflict, see Dynes, 1987).

Several of our interviews illustrate how individuals who had job responsibilities maintained or assumed their work roles. The first quotation is from a high ranking official in the metro or subway department who was on duty at headquarters when the first earthquake occurred. He noted:

> The behavior of everyone involved was rather exemplary. People received a great impact at their places of employment. One group that was hit very hard were the personnel from the central control office who were witness and protagonists in one of the most critical zones of the city. Our people were able to see first hand how the buildings around us were crumbling and collapsing. As they received the mass of phone calls from the [subway] conductors [on trains] and their families, they maintained their positions of responsibility with great composure and without problems. They realized that the place where they would accomplish the most would be at their jobs. And within the great uncertainty that we all faced, the general response of the staff was to do their jobs.

A Red Cross official described his experience:

> I was at my brother's house at the time of the earthquake. I woke up and felt very strong tremors. When the strongest ones were over two

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colleagues who had suffered damages called me up. With that news I started to worry a little and I drove downtown at about 7:25 and about 7:45 I was at Juarez Avenue...I was driving my brother's car which has the Red Cross symbol painted on it. I was stopped there and asked for help to rescue some people who were inside the former Department of Interior building... secretaries and cleaning people who go to work very early. Some were trapped in elevators and some were in offices with doors stuck. After helping there I helped to get some 10 to 15 children who were not trapped but who were wounded...I started thinking about what must be going on in my own house. I could see many people coming and going who appeared to be very frightened, so I decided to go home after telling them more or less what they had to do.

But this intention was also aborted:

Further down on Juarez I was stopped again to provide assistance. Some judges had been trapped in the building next to the Regis Hotel when they tried to rescue some people who were still inside. One of the central pipes broke, a fire started and they got trapped in there. The place looked like a giant blowtorch burning backwards. Fortunately the first Red Cross ambulance arrived with some of my friends in it. With the help of four of them we went in to rescue the judges who were OK.

Again he was concerned about going home:

At that point I told them I was in despair because I did not know how my house would be. I asked the assistant I had at the time about the conditions of the area. He told me it was very bad but people were starting to get organized. He also told me the chair of our committee had ordered me not to go to the Red Cross, but instead to head for the disaster zone, to prevent our young people from attempting rescues because they were for the most part adolescents and the situation was too dangerous. Also I had to go there to send information here to the headquarters and try to organize the people there and send them back to the headquarters. I went around the area all morning; I got some people to leave the area then I went to the Victoria telephone

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> office where I got some more people out. I
> reported at about 12:30 or 1 pm in the
> afternoon and was told then to come back here
> to the Red Cross so I returned at about 2:15pm
> and here I remained.

As indicated in earlier quotations and descriptions, most organizations despite the uncertain conditions in which they found themselves, attempted to move into action. They could try to do something because in the great majority of cases their personnel either were on duty and remained there or attempted successfully to get to their offices. Abandonment of work roles or failure to assume job responsibilities was not a noticeable problem in Mexico City during the emergency period.

In fact, there was a rough sequence in the response of organizational personnel. First, officials and staff generally remained at their jobs or those away from their groups went to their job locations (sometimes in very roundabout ways because of debris clogged streets and getting involved en route in improvised search and rescue efforts as in the case above). Then at offices and places of work, personnel made initial assessments of damages and instituted efforts to maintain or resume relevant operations. Usually resumption of full scale normal work activities was impossible or unnecessary in many organizations. This allowed in many cases, the organizational workers to form work brigades to help out others, usually people outside of one's own organization. (As we shall discuss later, the appearance of these work brigades ranged from those that were fully of a spontaneous and volunteered nature to those somewhat formally encouraged by the bureaucracies involved).

A different official from the one previously quoted described what happened in his organization as follows:

> Around 800 people work here and taking care of
> the damage done to it was very important.
> There was some real damage that occurred to
> this building that had to be taken care of.
> That was one of the first things we
> accomplished with the help of our people.

But then he notes:

> We had the opportunity to learn through radio
> and television of the magnitude of the tragedy.
> One of the first things that occurred after we
> reestablished metro service, was the
> establishment of brigades to help the people
> of the city. Some people within the metro
> organization suggested that we create these
> brigades, not so much as a help to any other

organization in particular. The general response was not what to do but rather just to do something.

We brought in medical, civil works, and administrative personnel. We brought in big and small trucks, equipment, medical supplies that we have in our clinics, such as oxygen tanks, shovels, picks, gloves and so on.

We organized brigades to be sent to the different zones of the city. The reports from that first day are that we arrived to the locations where help was needed the most, desperately, urgently. In the center of the city you only have to walk a few blocks to see the effects of the quake, the demolished buildings were they required help. The people welcomed the metro brigades. It was very helpful.

As the days passed, more organized forms of help arrived...That help lasted for a week until people realized that there was a lot of help, maybe more than required where the more urgent situations were being handled by more specialized people.

Thus, in many organizations there was an extending out of a somewhat collective assistance to others. One of the consequences of this was that a strong sense of social solidarity developed. It is possible that this contributed, as we shall indicate later, to the lack of dissatisfaction the great majority of our survey respondents expressed about the organized response to the earthquake.

To summarize, in this chapter we have depicted an assault on immediate postimpact problems; there was a massive ad hoc and emergent organizational response alongside a massive convergence on disaster sites by many individual and group volunteers. During the first three days, the response was certainly decentralized, and some organizational conflict emerged. However many tasks were undertaken, victims were rescued, the dead were discovered, shelters were established, lifeline systems were repaired or the services provided on an emergency basis, a morgue was established, and debris began to be cleared. Most of the activity was spontaneous and generated by needs in the immediate vicinity of responding organizations and volunteers. Although officials carried out their occupational or work roles only limited intra and interorganizational coordination was ever achieved. There was even less overall coordination of the organized governmental activities.

but this was partly compensated for by much emergent behavior as organizational personnel tried to do what they could in the situation.

CHAPTER 6

ORGANIZATIONAL RESPONSE DURING THE REST
OF THE EMERGENCY PERIOD

The initial three day crisis period extended through the weekend. However, on Monday morning, September 23, the first steps toward a return to organizational normalcy occurred. Government ministries, agencies, banks, public transit systems, and many businesses once again began operations, in some cases of a very normal nature. There were major exceptions. For instance, schools remained closed, with some in eight of the delegaciones not opening for another week, and others remaining closed for much longer. The massive organizational and volunteer response to the earthquake also continued. But it was now highlighted by changes in priorities, greater coordination, clearer task allocation, and a consideration of longer range problems.

From approximately the third day until the end of the two week period, coordination among responding units increased steadily. By the third day, the CME was functioning. It was publicly announced that major responsibility for coordinating the response within the city resided with the DDF. On September 23, the CME established the Executive Coordinator to take charge of the government of the DDF. Nightly meetings were held within the National Palace as the various subcommittees of the CME gathered to exchange information and coordinate activities.

The initial tasks remained the same, i.e., search and rescue, damage assessment, casualty care, emergency sheltering and the restoration of essential services. For the remainder of the first week these problems continued to receive the highest priority. Soon, however, other concerns came to receive increasing attention. These included handling the massive convergence of aid that flowed into the city both from within the country and from foreign countries, the integration of foreign rescue teams into the ongoing and formal search and rescue effort, the development of plans for long term sheltering and housing, and the eventual issues related to reconstruction.

With the increasing restoration of communication facilities and more comprehensive and accurate knowledge of the extent of the devastation, the coordination of activities improved. While some organizations, such as PEMEX, continued to operate autonomously, the integration of various units and the allocation of specific activities were heightened. Furthermore, the emergent, informal, individual volunteer action that epitomized the first few days of

the response was steadily superceded by formal, organizational activity. However, one should not assume that a centralized "command and control" model of emergency management evolved after the third day. At the level of operations, the response continued to be relatively decentralized. The broad scope of the event, the extensive demands that it created, the momentum of ongoing organizational activity, and the extensiveness of organizational involvement at the federal, district and delegaciones levels resulted in continued fragmentation. The DDF and CME were not "commanding the response" even after the first three days. They served more in the role of "brokers" for the ongoing organizational activities.

Initial Organizational Tasks

In order to better comprehend the variety of tasks and activities that were occurring during the two week period, we will describe a few of them in more detail. The following discussion will briefly consider some of the major tasks that were being performed and also note some of the problems associated with their completion. For purposes of exposition we describe twelve kinds of organized activities usually necessary in any major disaster:

    (a) doing damage assessment;
    (b) undertaking search and rescue;
    (c) providing emergency medical care;
    (d) maintaining security and access control;
    (e) distributing information;
    (f) drawing up lists of missing persons;
    (g) handling the dead;
    (h) restoring public utility services;
    (i) sheltering and feeding victims;
    (j) requesting and handling aid;
    (k) integrating volunteers into organizational actions; and,
    (l) coordinating organizational response.

The list is not exhaustive and the discussion of each of the tasks is not comprehensive. It is presented as a heuristic display of the critical areas and issues that more prominently appeared during the full emergency period.

a. Doing Damage Assessment

In the initial aftermath of the earthquake, literally hundreds of organizations engaged in damage assessment. For the vast majority of these agencies, the assessment was limited to their own resources and personnel. For example, information was gathered within the various Secretariats and departments of the federal and district governments. But this effort was very decentralized, and the sharing of information and the development of an overall

picture of damage was not facilitated very much by these decentralized and limited efforts at damage assessment.

Initial attempts at overall damage assessment were given in reports presented by officials at an emergency meeting of the Federal Cabinet on the day of the earthquake. It is certain, given what we know of the limited knowledge that almost all organizations initially had about the disaster, that the information could not have been other than incomplete and inaccurate in some respects. In later days, the CNE and CME would receive nightly updates. Nevertheless, it would not be until several days before a fairly accurate overall picture of the extensiveness of the problems created by the earthquake was available. But even to this day, certain important kinds of information, such as the actual number of the people who were killed, remains unclear.

Within the DDF, two agencies independently worked on the problem of general damage assessment, especially to buildings. The Department of Public Works and the Office of Civil Protection both undertook the task. However, it appears that they did so somewhat independent of one another, although the former seemed more involved in this task than the latter group. Representatives of these organizations in their interviews made no reference to the work of the other. Given the magnitude of the event, the problems of communication, the difficulty of physical movement in the damaged areas, and the decentralized nature of response activities, this situation is understandable.

Apart from overall damage assessment, there was the matter of specific damage assessment. That is, hundreds of sites had to be evaluated because in many cases it was thought that people might be still buried alive in the debris and rubble. In these cases often an engineer or architect from the private sector had a role in the damage assessment of particular buildings.

The actual amount of damage assessment of buildings that was carried out is unknown. However, one report states that there were a total of 7,924 separate studies made. Partly as a result of the analyses made, 613 evacuations of still standing buildings were ordered as well as the evacuation of an additional 99 buildings because of problems in neighboring structures (Perez, 1987).

b. Undertaking Search and Rescue

Search and rescue activity began immediately after the earth ceased shaking. As we have noted previously, thousands of individual and group volunteers and many organizations eventually engaged in this task. The activity continued for about two weeks at a variety of sites; however on September 26, the CME announced there was no possibility of finding more survivors. Of course as in almost all disasters the vast majority of those who survived, were rescued during the first hours in the first day.

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This activity involved a rough sequential convergence of three different types of volunteers. The initial search and rescue was undertaken by individual survivors around buildings that had undergone the heaviest destruction. A few military groups who were near the spatial points of heaviest destruction also quickly joined in the activity. In the first few hours, in addition to individual citizens and military personnel, small groups made up of workers, students and others who had preimpact social ties with one another, joined the effort at search and rescue. One informant from a large preimpact organization of tenants described the situation as follows:

> All the people, according to their abilities began to organize themselves and attack the rubble. But this was mostly determined based upon concrete needs, and the perception of what could be done in the immediate area. In other words, with regard to rescue the authorities could not say, "This is the one who will coordinate the matter." It was more determined on the basis of who had the best feel for the actions they proposed. If you had to move some tiles, or pile of rubble, whatever, if a suggestion made sense then that group of people would organize itself with those persons that had a certain knowledge or practical ideas on how to attempt the task. At this time there was great participation by residents and citizens. It started to become organized when machinery and different kinds of resources began to arrive. These came from authorities and various companies, like PEMEX.

This almost classic example of emergent, collective behavior epitomized the initial search and rescue activities. Through time, however, the task took on greater formal organizational involvement and coordination. As we previously noted, many federal and district agencies, such as PEMEX, the Department of Transportation, the Fire Department, the Metro System, The Institute for Security and Social Services for State Employees, the Secretariat for Urban Development and Ecology, and of Public Works, selected specific work sites and attempted some integration of the rescue efforts at those locations. In addition, the MOLES (a team of volunteer miners who are trained in rescue in cramped quarters) assisted in specialized rescue activities.

The nature of high rise urban rescue created the need for heavy machinery and equipment (Olson and Olson, 1987). Private contractors who worked during nondisaster periods with the various agencies supplied these needed resources including operators for the machinery (e.g., fire department personnel did not man the

borrowed heavy equipment). Coordination of these efforts was generally _intra_organizational in nature, with each group working basically autonomously or independently of one another. However, as we discussed earlier, the Army (which had responsibility for security and access control to the sites) did coordinate its activities with groups such as PEMEX and the MOLES.

In the following days, the voluntary search and rescue activity changed from being a primarily individual or small group and informal mass assault, to a more formal and organized effort undertaken by organizational personnel and group volunteers. The brigades of workers from the various agencies collectively undertook the task under the supervision of construction and design experts from their units. By the end of the third day, this pattern of formal rescue had supplanted the original, individual and informal response.

In addition to the usual problems of logistics as well as a more atypical problem of searchers being killed in doing later rescue efforts, the search and rescue tasks involved some problems of integration and also disagreements over rescue strategy and techniques. In particular, difficulties arose in integrating the original volunteer activity with the developing organizational response and in integrating the efforts of foreign rescue teams (and personnel from domestic fire departments such as from Vera Cruz, Jalapa City and Puebla City who came to the capital city). Conflict erupted at some sites as persons who had initially engaged in attempting to rescue their friends or co-workers were denied access by the arriving official units.

The foreign rescue teams came from a number of countries, including France, Switzerland, Canada, Italy, Brazil, Germany, and the United States (e.g. see Frisch, 1986). Because of logistical problems, they were not able to arrive on scene until after the huge majority of the survivors had been rescued. The foreigners did possess special skills and specialized resources and worked long days in searching activity. They found some bodies and helped locate a few buried survivors (including the most famous, namely some of the 22 babies found buried alive in the debris, 19 of whom were still alive two years later). But their contribution was rather minor when seen in the context of the massive search and rescue efforts that were undertaken by the Mexicans themselves and which were initiated right after the earthquake impact. In fact, there was some expression of resentment and anger in Mexico that the international mass media attention on foreign rescue teams with dogs seemed to imply that little search and rescue had been undertaken before their arrival; the Mexicans of course knew that their own survivors and the local population had been the prime rescuers in pulling and digging out thousands of victims right after impact.

Moreover, integrating the foreign effort with the ongoing local rescue work was at times problematical. Problems of gaining access to sites and of authority and control of operations at sites, and disagreements over strategy sometimes occurred (see e.g., Montoya, 1987). Perceived ethnocentric attitudes of some foreign rescue workers at times contributed to tension in interactions between Mexican officials and outsiders. Finally, disagreements over the strategy of rescue arose on occasion between those favoring different techniques such as the use of dogs, electronic listening devices, and heavy equipment.

One consequence of this overall multiple assault on the problem is that there was unevenness in the search and rescue activities. Some specific sites were searched repeatedly by different groups. But there were also seeming instances where no systematic search and rescue was undertaken _after_ the immediate initial effort at finding survivors. Figures vary widely as to how many victims were rescued alive who had been deeply buried in rubble; in his State-of-the-Union address a year later, the President of Mexico cited a figure of 3,226 (de la Madrid, 1986: 5); most other reports give lower figures.

In summary, search and rescue activity evolved over the two week period. At first it was mostly individual and small group efforts. Then the task was taken over by more formal groups who tended to operate autonomously at a variety of sites. No one organization ever assumed overall control or supervision of these efforts.

c. Providing Emergency Medical Care

As was previously noted, the health sector was severely impacted by the earthquake. Three of the largest hospitals in the city were destroyed and about 4,900 hospitalized patients had to be relocated to new quarters. However, it must be noted that there was no shortage of hospital beds for the injured, nor was there a shortage of medicines. The existing system was large enough to absorb the losses and still provide adequate medical care.

On an everyday basis, there are several emergency medical systems (EMS) for getting accident victims to hospitals. Although some officials reported shortage of ambulances for this purpose, this did not seem to be a correct overall perception. Ambulances were available from a number of agencies, including the Red Cross, the Green Cross, DDF, PEMEX, IMSS (Social Security) and private agencies--in all, there were more than 600 EMS units available. Furthermore, some victims arrived in private vehicles and many more walked to aid. The choice of which specific medical facility to go to appears to have been based mostly upon proximity and by ambulances taking victims to their own home hospitals. In addition, the Red Cross and other federal and municipal agencies established at least 281 first aid field stations (Perez, 1987: 7)

who treated over 16,000 for medical problems. As noted by one medical authority:

> Selection of treatment was by closeness to some unit that was not affected. If there was some was some spot or place or method of attending to patients, they went there. If it wasn't that central, it was the next nearest that had space. Yes, there was some duplication of effort, and there was concentration of resources in the affected zone of more than was needed. There were sufficient resources, but they were not distributed well at first. After the first few days, this improved.

Given the debris clogged conditions of the streets, it is noteworthy that there was little difficulty reported in transporting victims to medical care. But while transportation of victims did not occasion major problems, there was a lack of triage at most disaster sites. What happened was what typically happens in most disasters. As one official from a medical organization noted:

> Well, in transporting the hurt people, we lacked adequate triage. It was not done in the majority of places. They were triaged only at the place where treatment was given.

Part of the problems faced in providing emergency medical care were a lack of prior planning and adequate interaction among the responding units.

> The problems were in knowing those in charge of handling disaster medical aid, because we did not know them before. There wasn't any pre-disaster communication. We knew that each institution had its department for emergency response, but we were ignorant of many contacts, and of many decisions being made.

In addition, even on an everyday basis there is no radio system linking the different hospitals. With phone service erratic at best, communication was sometimes a problem. Many personal messengers were used to get around this difficulty.

Entry into hospitals, which numbered in the low thousands, peaked about five days following the earthquake and then fell below normal levels. Through time, the overall coordination of the health sector was undertaken by the Secretary of Health and the Secretary of Public Health. As part of interorganizational actions, the IMSS provided over 12 tons of drugs and treatment material to the Mexican Red Cross and the General Hospital (Perez, 1987: 7). In general, however, the emergency response was decentralized. After

the first three days the nature of the tasks and coordination shifted to issues of long-range restoration of health facilities, since whatever survivors were being found after that time were so few in number that they could be handled in the usual way in such a large metropolitan area as Mexico City. Also, about 1,000 medical personnel with 150 supervisors were formed into brigades to provide mental health care for the general population

d. Maintaining Security and Access Control

After being quickly relieved of overall responsibility of the emergency response, the Mexican Army was assigned the task of security and the cordoning of areas around damage sites (along with the police). This activity began on the first day of the earthquake and continued throughout the emergency period.

In many disasters, the matter of who should have access into secured areas, often results in disagreement and conflict. This disaster was no exception. There was no overall official "pass system" of any kind established; limited attempts to use such a procedure were made only in certain areas. Entrance was left to the discretion of the soldiers at the scene with cars being more often blocked than pedestrians. As one official involved in the activity noted:

> There was a system where a person had to show a document. It could be a license, a rent receipt or electric bill; something that showed that they lived in that place. Now there were two types of risks that decided who would gain entry. In high risk areas, where buildings were on the point of falling, they did not permit anyone to enter. In the areas where there was a medium risk of falling objects, there was a possibility to enter based on ownership to remove belongings. It was the second or third day before this system was established. At the beginning, it was a mess.

While some organizations such as PEMEX, and formal groups such as the MOLES, reported good working relationships with the military at rescue sites, other groups expressed some dissatisfaction with the security measures. Certain organizations, such as the electrical power department, issued passes to their own personnel that were however not recognized by the Army. We noted earlier that one delegacion had to disguise its workers as stretcher-bearers to gain entry to areas to conduct a census of missing persons.

But after the initial three days these interorganizational problems seemed to lessened. It is possible that in the later phases of the emergency period, there was less reason for groups to seek entry

into blocked off areas. In any case, while no formal pass system was ever established, access controls became normalized and routinized.

As we shall note later, while some organizations had problems with the military in getting access to certain disaster sites, citizens seemed less disturbed by the control measures instituted. Our survey data indicted that few residents of Mexico City saw this as a major disaster related problem.

While it can not necessarily be attributed to the security measures undertaken, there does appear to have been very little looting. However, numerous stories about such behavior did circulate including some attributing the behavior to the police and the military. And foreign news stories about the disaster implied looting was a problem. For example, the **Newsweek** story of the earthquake incorrectly said that:

> The earthquake brought out the best and the worst of the Mexican system. Armed forces and police quickly implemented a longstanding disaster plan. While about 30 army helicopters hovered overhead, 600 motorcycle cops fanned out over the hardest-hit areas of the city, joining both Army and Navy foot personnel to combat looting (Anderson, 1985: 20).

But actual instances of looting behavior in damaged localities were apparently few in number. Extremely few of our survey respondents mentioned it as a disaster related problem even when specifically asked about the matter. There were more clearly authenticated instances somewhat later of profiteering with a few merchants raising prices between 300 and 400 percent or the selling of water (Palacio, 1986: 32).

e. Distributing Information

Obviously, the earthquake occurred without warning. However, in the days immediately following the impact there was a massive demand for information on the part of both organizations and the public. Information was needed about such issues as the extent of damages, the availability of services, the well being of relatives and friends, whether certain places of work had reopened, the possibility of further earthquakes, the safety of the water supply, other secondary threats to life, and where aid and assistance could be obtained (some of what individuals wanted to know will be discussed later in Part III). In addition, some organizations had certain announcements and requests that they wanted to reach citizens. So the problem in distributing information was in both directions: from groups to citizens as well as the reverse.

During the initial few days there was no centralization or coordination of the distribution of information. But there was an intense search for it. There were two major channels for information distribution: interpersonal networks and mass media reports. Persons turned to their friends, relatives and neighbors to find out what was happening. They also, as we will depict in Part III of this report, became very heavy consumers of mass media accounts, particularly those from television and radio. Now these channels were not only used just by citizens; organizational officials also relied heavily upon mass media accounts and stories. As one representative from a delegacion noted:

> What I learned, I got from the radio. The media people were coming to me and asking for information, but all I really had was what I had just heard from them.

Of course some organizations were distributing information. The Red Cross, for example, made many public announcements regarding sheltering, medical care and health threats. Workers in the various delegaciones presented information to reporters from the mass media. Public health authorities tried to distribute information about health concerns and threats as well as making announcements about boiling water to be used for drinking purposes. However, there was no overall coordination of this output of information and widely varying damage accounts, death totals, instructions and conflicting directives were distributed.

One official in the health sector described these problems in the following manner:

> The Secretary needed information. We sought information about the number of injured, dead, victims, trapped persons, and so on. There was some confusion that we noted in the management of information. For example, the Red Cross indicated that they alone had transported around 10,000 cadavers; this never appeared in any later data...We thought that various organizations were withholding information, so we had to look for different ways to get it. The other major problem was that the numbers were different on all sides. The newspaper gave some numbers, we collected others, and the official numbers were different too. So, we didn't have an exact idea or even a close approximation of the magnitude of the problem.

Given this situation, two patterns often observed in other disaster settings appeared. First, after the earthquake and particularly during the first and second days, some of the television and radio stations turned into channels for interpersonal communication.

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They spent considerable time in relaying personal messages to their audiences. Second, in addition, rumors spread through the networks of interpersonal relationships. As Shibutani (1966) has noted, in the absence of important information and at times of crises, rumors are a form of improvised news that aids in structuring the situation. Rumors about another earthquake, the likelihood of an epidemic, the exploitation of victims, and many other issues flourished.

Within the DDF, an early attempt was made to centralize the distribution of information in the office of a Public Information Officer. By about the second day, workers in the delegaciones were told not to distribute public announcements and that all official information would come from the DDF. However, with the decentralized nature of the response activities this attempt was less than successful because the information office knew little about much of what was occurring all over the metropolitan area of Mexico City.

During the later part of the emergency period with the organization of the CME and the legitimacy conferred upon the DDF, more formal sources of "official information" developed. According to one account, there were at least 263 official bulletins, 120 public announcements, over a million flyers, etc. in a massive paper flow from the Mexican government (Zinser, Morales and Pena, 1986: 91). Another report states that 112 information booths were installed in different parts of the city where 642 representatives of a dozen agencies answered inquires of over 168, 535 people (Perez, 1987: 5). Of course, as in all collective emergencies, the distribution of all information was not fully centralized. Multiple sources of information continued to be utilized by mass media personnel, and citizens naturally did not stop talking to one another.

f. Drawing Up Lists of Missing Persons and Victims

During the initial two to three days, there was no coordination whatsoever in the efforts made to establish a listing of victims. Many different organizations began compiling their own lists. Workers in the delegaciones, employees at hospitals, members of the Red Cross and many other organizations independently assumed this task. In addition, a rather elaborate system of informal notices placed in public areas by citizens also emerged. The task, obviously, was difficult, given the parameters of the event. An informant in the health sector described the problem:

> We were gathering information in selected areas. Much of it was done through the mass media. It was at first locally done. For example, in Juarez Hospital and General Hospital they put down persons "that were working in the quake." Also, there was a list of persons "that didn't appear," and that had

not returned home. Additional lists for those
"people who were found and identified,"
"identified cadavers," and "unidentified
cadavers." So, sometimes there was some
information, but it was localized at that
center. The Secretary of Health did not at
that time have a specified department to give
out and collate this information.

After the initial period, the task was officially assigned to
LOCATEL, the Bureau of Missing Persons within the DDF. Information
from the various delegaciones were submitted to them and a daily
census of victims was constructed. With the increasing general
legitimacy accorded to the disaster role of the DDF, the task
became better managed. However, as we indicated earlier not even
all organizations had ready access to LOCATEL which handled over
144,000 inquiries and distributed lists in 42 information and
inquiry centers.

It is difficult to assess how well this activity was carried out.
From an organizational point of view, many officials felt pressure
from relatives and friends who sought missing persons. However,
our survey respondents did not list the question of missing persons
as a very important problem in the aftermath of the disaster.

g. Handling the Dead

While the exact number of dead from the earthquake remains unknown
to this day, it was at least 5,000 to 7,000. During the first
three days the recovered dead were placed in a number of scattered
locations. For example, cadavers were initially brought to
headquarters of delegaciones, some hospitals, and other sites.
Later a central morgue location was established.

Responsibility for handling the cadavers was rather quickly assumed
by the DDF and the equivalent of a Coroner's Office in the United
States. One official reported what was partly done:

The movement of cadavers was carried out by the
DDF. They are the agency who should have been
in charge, because they have a sufficient
number of medical students to have a center for
the collection of cadavers. But this center
was insufficient. So it was decided to use the
Seguro Social Park (a baseball stadium) because
it was in a central zone. In that part of the
delegacion most affected, that contributed the
most cadavers. It was near hospitals and many
affected homes.

The centralization of morgue facilities, however, did not occur
until the third day and the task presented a number of problems.

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First, there was difficulty in transporting the bodies. On an everyday basis, there are only eight vehicles available for transporting bodies. This normal resource was badly overtaxed by the thousands of cadavers that had to be handled. Eventually, buses as well as trucks and other vehicles were used to move the bodies.

Second, it was often difficult to identify bodies. By the fourth day of the emergency period, the Seguro Social Park had received 2,600 cadavers, of which 96 percent were not identified. Six days after the earthquake the CME stated that of 3,286 bodies, 80 percent had not been identified. A number of the cadavers were never identified, a problem typical of large mass casualty situations especially in developing countries.

Third, the large number of unidentified cadavers led to the question of what to do with the bodies. On the first day, a decision was made to dispense with autopsies of victims of the earthquake and to immediately deliver identified corpses to relatives. In the initial days also, the authorities attempted to cremate the bodies that had not been identified. But after a brief time this procedure was terminated because of public protest. In demonstrations, citizens paraded signs that said "we want bodies". Eventually the unidentified bodies were buried in a number of mass graves. However, this too was protested with signs saying "no incinerations, no mass burials." This procedure in most places usually leads to public protest (DRC has encountered this reaction to mass burial in countries ranging from Iran to Italy, see Blanshan and Quarantelli, 1981). But there was a recent precedent in Mexico City; unidentified bodies were also given mass burial after a gas explosion and fire at a PEMEX installation killed more than 450 residents in 1984. However, the mass disposition of bodies in that situation evoked no public protest according to a DRC study of the event; it was speculated that this resulted from the fact that the dead were almost exclusively recent rural migrants from the lowest socioeconomic strata of Mexican society.

h. Restoring Public Utility Services

As we already have noted, from an organizational point of view there was considerable disruption of many utility services. As we shall describe later, our survey results also indicate that a majority of residents of the capital had interruptions of their water, electric and telephone systems.

Restoration of such services was the prime goal of the involved organizations. However, they had to struggle with a variety of obstacles created by debris clogged streets, numerous and widespread breaks in infrastructure links, and damages at times to central installations and headquarter buildings. It took time initially to ascertain the extent of damages to facilities, finding and mobilizing needed resources, and communicating both within and

outside the utility organization. The context of and difficulties in undertaking activities are indicated in the following remarks from a high official in a public works department who was on duty at the time of the earthquake.

> The tremors hadn't stopped before I was on the phone with the executive director of the water system to check on the system and with the director for the control of hydrologic systems to check on the operations of the dams...that initiated inspection of our works...if there was any damage in the underground. There was no electric lights and the telephones didn't function well. Communications was difficult but we had our radio and this way we found out through the course of the morning that we didn't have much reported damage outside of the city. At 10 am we solicited all the machinery from the areas surrounding Mexico City to be concentrated in the city to aid the removal of debris...the same Thursday we organized here some brigades and a center of communication... we began to give instructions to teams without initiating contact with anyone else...clearing rubble, rescue of some victims... assessing damages to buildings...on Friday, findings faults in the southern aqueduct. Saturday, we began to work on a scheme for distributing water...about the only communication we had with the department...they assigned us a specific area to work....the distribution of plastic bags and tanks of waters...we distributed from our wells....we restored some services within ten days.

This illustrates that even when coordination problems did not hinder an organizational response, there were other problems which did, such as poor communication flow. There were difficulties too in launching an informational campaign to get citizens to boil water. However, despite all the difficulties the fact of the matter is that enough water was distributed so that it never became a serious problem for the population at large. This supposition is also supported by the survey data which indicates that while people factually noted that they had disruption of water supplies, there were practically no complaints about an inability in getting water to drink and use or about the water company activities in restoring services.

While the above is an illustration of what one lifeline organization did, the same picture emerged from our data with respect to the electric and the telephone companies. Initially these too struggled with trying to ascertain the nature of the

damages they had sustained, what resources they needed and were available, and what priorities they ought to assign in restoring services (the telephone company provided free calls between September 19 and October 7 if they were made at 13,000 boxes in the center of the city). They too had intra and interorganizational communication problems.

i. Sheltering and Feeding Victims

There were several patterns in the victim sheltering activities that occurred immediately after the earthquake. For one, a variety of public and private organizations, as well as individual citizens, attempted to help with the sheltering of those displaced from their places of residence as a result of the disaster. Also, collective mass shelters tended to emerge rather spontaneously as victims would gather in public areas and places close to their damaged or destroyed homes. As one informant noted:

> The location of shelters was just by chance
> on the first day; by people standing in the
> streets in front of their homes, at the
> beginning. People were in the streets,
> sidewalks, and gutters.

There was no official attempt to coordinate either the initial formal or informal shelter locations.

Rather soon too, many different organizations, including the Red Cross, churches, and the delegaciones developed their own mass shelters. As one of our informants noted:

> Everyone wanted to open shelters. It was
> another problem of coordination. Some of the
> shelters were adequate, such as the two opened
> by PEMEX that housed 200 people each. Others
> however lacked adequate space and sanitation.

As we will discuss in more detail in Part III, the number of people who were homeless as a direct result of the earthquake is not certain but probably numbered, as a very minimum, several hundred thousand persons. A variety of mass shelter arrangements were made. Basically however there were two types of temporary shelters: first, provisional housing in buildings such as schools, churches, auditoriums, and second, tent camps set in parks, gardens and parking lots (Perez, 1987: 10). The rough estimates on the actual number of such shelters established during the first few days vary from about 150 to 300. It is known, nevertheless, that the vast majority of the homeless did not use such public mass shelters of any kind, but instead found shelter in the homes of relatives or provided for their own housing. One report also states that 174 shelters were set up and 76 camps build on streets mostly around damaged tenement buildings with the greatest number

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of these being established within the first ten days (_Housing_
Reconstruction Program, 1987: 13). One estimate is that about
9,000 stayed in makeshift mass shelters in parks and another 30,000
may have utilized formal mass shelters; our survey data indicated
that these were almost exclusively persons from the lowest
socioeconomic strata in the city who tended to gather together with
friends and known others.

After the initial three day emergency period, an attempt was made
by the DDF to consolidate the mass shelter arrangements. The DDF
was managing about 30 shelters of its own in various schools,
stadiums, and parks, with the managing being done by workers from
the delegaciones. On the sixth day, a plan was made to consolidate
the smaller mass shelters into four main and longer term public
shelters. However, many of the private and informal mass shelter
arrangements continued throughout the emergency period, and some
even longer. Furthermore, the actual mass shelter managements and
operations were left to the individual delegaciones, many of whom
assigned the task to the social welfare units of their
organizations.

The provision of food was similarly handled. A variety of public
agencies, private businesses, restaurants, relief agencies and
individual citizens provided emergency feeding. PEMEX, for
instance, provided food for its workers, and after determining the
amount of food that would be needed to feed its people, it
increased the amount by 50 percent in order to be able to offer
food to needy victims. Food poured into headquarters of the most
seriously damaged delegaciones. The Red Cross, churches and
neighborhood groups also provided meals.

Control of the distribution of food to mass shelters but not
elsewhere was coordinated by the DDF and CONASUPO after the initial
three day period. Food was brought to CONASUPO and was distributed
from the central location to the shelters. Within the Department
the coordination was handled by the division of culture and
tourism. It should be noted, as in most disasters outside of
famines, that there was no significant shortage of food at any
time.

j. Requesting and Handling Aid

Initial requests for needed supplies and resources came from a
variety of organizations and agencies. At the federal level, the
Secretary of Foreign Relations was appointed as coordinator of
international assistance. This appointment was made on the second
day. A few days later, a similar post was created within the DDF
to handle foreign aid used within the federal district.

At the municipal level, the pattern of requesting aid was diffuse,
decentralized, and uncoordinated during the first three days. Many
groups worked somewhat independently in obtaining needed equipment.

PEMEX, for example, because it maintained its own communication system, was able to contact directly many potential donors and contractors. The Red Cross and various other private agencies also made requests and obtained aid. The Secretariats of Urban Transportation and of Health were able to coordinate some of this activity for their various departments.

Tons of material, supplies, medicines, clothing, and food poured into Mexico City both from within and outside the country. As of October 13, 237 foreign plane flights alone had delivered 1,462 tons of aid (Perez, 1987). About 43 countries provided personnel and/or goods (de la Madrid, 1986: 5). As has been observed even in the earliest studies of disasters (Fritz and Mathewson, 1957), the convergence of materials proved to be far in excess of the needs of the victims, and was mostly composed of much unusable and unneeded items. This created serious problems for collection, distribution and disposal.

For example, very large quantities of medical supplies arrived although there was no shortage of medicine in Mexico City. Many of the drugs were labeled in a variety of foreign languages, which created severe problems for inventorying. Additionally, there were many unneeded and unusable medical supplies. Similarly, clothing arrived in massive amounts, but some of it was not usable in a semi-tropical country such as Mexico. One storage room was eventually filled with shoes that were only for the right foot.

During the initial three day period, there was little attempt to coordinate this inflow of material. Donated food and clothing would be taken to delegaciones, the Red Cross, churches and other organizations to be distributed in whatever ways the groups wanted.

After this initial period, however, the DDF and the Red Cross developed a system to coordinate and manage this aid (for the Mexican Red Cross interactions and problems with counterpart national Red Cross organizations elsewhere, see Drabek, 1989). The DDF established five major warehouses in the city for storing the vast amounts of materials that had arrived and were being received. Any supplies that were specifically addressed to the Red Cross were sent to that agency; all others were handled by the DDF. A number of volunteers worked with the Red Cross and DDF personnel from a variety of departments in the inventorying, distributing and disposal of the material. From the warehouses, the useable and needed supplies were distributed to victims at the various mass shelters that were established throughout the city.

One informant from the Mexican Red Cross described the activities in the following manner:

> All this food, clothing and materials was
> arriving. A time came when the hospital could
> no longer handle all the stuff. When that

happened, Sears allowed us to use its garage
as a new collection center. We went there with
a number of volunteers and opened the storage
place. In one area we put medicines. There
were doctors and volunteers who knew how to
classify them. In another place we put
clothing. We would have 30 or 40 vans per hour
being driven out of there loaded with food,
clothing, etc. to the destroyed areas. By the
fourth day, this site was inadequate, and we
had to move out into the parking lot. This
continued for some time.

Although this flood of aid eventually tapered off, the task of
handling the supplies involved thousands of people and continued
over months. There were particular difficulties in handling
international disaster assistance (see, Comfort, 1986). As will
be noted later, this was in fact one of the few areas in which our
survey respondents were relative negative in their evaluations of
the activity at the local level.

k. Integrating Volunteers Into Organizational Activities

The massiveness and extensiveness of individual volunteer helping
behavior will be discussed in detail later, including the fact that
at least 2,000 000 residents of the capital city volunteered some
services sometime in the first two weeks after the earthquake. But
it is important to realize that a significant portion of that
activity involved collective, organizational volunteering by people
working as organized units with their fellow day-to-day coworkers.
Here as elsewhere in the response to the earthquake, there was
considerable intermixing of organizational and individual
behaviors.

There were problems in training, controlling and integrating the
individual volunteers that were used by such organizations as the
Red Cross, the delegaciones, and certain units of the health and
transportation sectors. Previously, we noted that one informant
from a public works agency commented that it was difficult to equip
and utilize all the volunteers who wanted to assist. Similarly,
an informant from a major relief agency made the following
observations:

What we first did was try to have some control
of all the civil volunteers who joined us. But
this was not done the first day. That day was
actual chaos; not on the part of the leaders
and directors, but on the part of the middle
ranks. At this level, we followed the
directions of our President, but in going down
the orders were diluted a lot since there was
an enormous problem. You see we had lots of

civilians who, due to their lack of training, would do as they wished at every particular moment. They would never see the necessity of getting organized and, thus, we happened to have lots of civil volunteers who were categorizing clothing and medicines, when we had nobody cooking.

So the first thing we did was to control those people and see how many of our own volunteers we had, as well as volunteers from outside the organization. Then we had to decide where they might be needed, and after that, to control them. We finally to get organized had all the volunteers meet on the afternoon of the second day at two sites.

This pattern has been observed in a number of previous disasters (Dynes, 1974; Mileti, Drabek and Haas, 1975: 110). Many organizations simply do not plan and prepare for the integration of volunteers into their activities, and when massive numbers of helpers suddenly appear, coordinating their efforts can become difficult. It is interesting to note that a number of responding organizations in Mexico City simply sidestepped this problem by not utilizing any volunteers who were not part of their everyday organization.

1. Coordinating Organizational Response

Given our previous depictions of the behavior of various groups and agencies, it is not necessary to document further the absence of overall organizational coordination. However, from an observational viewpoint it is of interest to note that few officials thought that it was either necessary or important to impose centralized "control" on the situation. Rarely at the emergency time was the question asked which is sometimes asked by operational personnel in the United States: who is in charge? (Although much social science research argues that this is not a very meaningful question to ask, see Dynes, 1990). Most officials instead emphasized the need for overall coordination and cooperation.

Intraorganizational coordination was a little more common than overall coordination, but it too was often problematical. Frequently there were serious difficulties in information flow among personnel especially with disrupted phone services and the need to often communicate to widely dispersed work sites. Nevertheless here too some organizations were able to improvise to cope with the problem.

For instance, in the case of the Red Cross:

ambulances from other provinces, which had radios that operated on frequencies that differed from those in the Federal District, were integrated and strategically placed so as to form an improvised radio communication net covering much of the metropolitan area (Drabek, 1989: 46).

However, despite the relative absence of overall, inter and intra organizational coordination, many things were done and were done in an organized fashion as we have illustrated in a variety of ways. Furthermore, what organizational personnel did, created a positive social climate. It is clear that as groups and their workers attacked problems in the aftermath of the disaster, they developed a strong sense of social solidarity.

While many of our organizational respondents expressed some sense of social solidarity, most had difficulty in articulating it well as in the case of the following:

> I think that in some ways one cannot, without having lived through this type of situation, express the situation. I think the experience, to feel what I myself felt is something that at times is indescribable. I think that in this matter the country was transformed in a serious way. I feel that the people who lived through the earthquake, participated in the acts of solidarity. We proved to ourselves that this was a country that could rise to the challenge, that we had the will to do so. I think that in a sense, I'm not sure how to express it, but I would say that when a great difficulty comes that we were able to confront it. I believe we all share an association based on our common experience of the earthquake. We were all affected in one form or another, friends, companions. Others suffered injury to their property while others had the good fortune not to suffer any of these things...but all were traumatized. We all remain conscious of the fact that in these events we must all cooperate. We saw the people as a group, not just specialists. It was a test of how solidarity can help overcome the challenges.

As we shall discuss later, it is possible that this sense of solidarity contributed to the relatively little dissatisfaction that our survey respondents expressed about the organizational response to the disaster. It is also consistent with the survey finding that as a result of the earthquake a clear majority had

developed after the disaster greater trust in other people than they had before the event.

Views and Actions About Disaster Planning

There was neither overall nor anything resembling community wide disaster planning in Mexico City. The only semblance of such thinking, embodied in the military DN-3 plan, for several reasons as was discussed earlier could not be implemented. Otherwise, other planning existed only in certain agencies and was primarily geared to emergencies rather than disasters (e.g., in the subway system), and was almost totally _intra_ rather than interorganizational in nature.

In the absence of such planning, organizations struggled to cope with and meet the demands that surfaced in the emergency time period. While most needs were eventually met, the effort was marked by delays, uncertainties, overlaps, gaps, and was at best somewhat effective but certainly not efficient. Many involved organizational officials not only recognized this situation in retrospect, but thought nonetheless something should be done to prepare for future disaster occasions.

One of our respondents reflected six months after the disaster upon the importance of planning in this way:

> We can now take advantage of the experience. I think that those of us who had any kind of responsibility about the organization should have written something...about how it worked. To transmit the experience, an effort has to be made to have a certain method. We must be critical, self critical about what we did... there is the possibility of setting up small groups of people who would be responsible for this kind of planning and the possibility of systematic drills. We also know that there are other countries which have had similar disasters. Take a look at other countries... what can we learn from those experiences...why not study those experiences to learn from them?

Another official, from the Red Cross, said:

> We could see that the enthusiasm, the efforts of the young and the adults alike, many times didn't produce the best results. We weren't ready for such a big disaster. The Red Cross is ready to face any emergency but not everyone is ready. The idea is to educate people so they know what to do in the case of a big or smaller emergency. One's frightened at first

> and then reacts and wants to help. Sometimes
> the best help is to keep out of the way.
> Sometimes we need to know where we might be
> useful. Training is very important. Then,
> once you are where you're needed, you need to
> know what to do and how to do it. That's
> something we have to accomplish.

These kinds of comments were typical. Official after official,
while often stating that generally their group did the best it
could in the situation, indicated that organizational planning or
its improvement was needed for future disasters. In part there
seemed to be a perception that a future occasion might be much more
organizationally demanding than the 1985 earthquake. There was a
widespread feeling appearing soon after the disaster that something
should be done.

Even more important, steps were taken at different levels and
within particular organizations to either institute or improve
disaster planning. As one official said:

> Everyone did his best and things didn't go too
> badly given the circumstances, but people
> learned that it was necessary to work more and
> be more prepared. So we have taken certain
> steps.

In the year following the earthquake, at the national level
substantial steps were taken. A completely new agency, the Civil
Protection Organization, was temporarily created by Presidential
decree and provided with personnel and resources. A national
disaster plan was initiated. The organization moved to encourage
and promote planning at the various state levels. Plans were made
for undertaking training and research. Organizational links were
established with both domestic and international groups involved
in disaster planning and studies. Building on these aspects and
within four years, as we shall note later, a permanent, full scale
organization with multi disaster planning functions and
responsibilities was fully operational and institutionalized as the
result of the passage of federal legislation.

Several other key organizations also consciously improved their own
disaster planning in the relative immediate aftermath of the
earthquake. The Office of Civil Protection at the DDF level, for
example, wrote an extensive after action report on activities and
problems in the disaster. This eventually led to the agency being
given coordinative responsibilities and more resources. This
enabled it in the year following the disaster to undertake more
planning including carrying out seven drills ,one of which assumed
there would be an earthquake affecting the central zone of the
capital city.

The Mexican Red Cross was also another group which instituted structural and functional changes for disaster preparedness. For instance, at the time of our study seven new Emergency Centers (out of a network of 16 planned) had been established throughout the metropolitan area to provide a decentralized capability. They were to function as ambulance dispatch, first aid, volunteer training, and emergency and disaster relief centers. The Red Cross also planned and started to implement a National Training Center to train the civil population through educational courses in the rendering of emergency services, rescue operations, transfers to hospitals and paramedical and other services in the case of disasters. In addition, a National Communications Center was in the planning stage with the objective being to have a facility which would have a location and equipment for alternative and efficient radio communication in case of emergencies and disasters.

Since our study extended only up to a year after the earthquake, we do not know how many specific organizations actually changed their disaster planning (at least half a dozen of the groups we studied had changed in some way). Nor do we know whether what was instituted was the most appropriate steps to take. But some organizational change in planning did occur, a relatively rare post disaster consequence in most cases, as we shall later discuss.

One implications of these observations are obvious. While good disaster planning will not ensure that there will be timely damage assessment, effective resource allocation, appropriate intra and interorganizational coordination, and the rapid restoration of services after the impact of a disaster, its absence will hinder their realization. An emergent and ad hoc individual and collective response may eventually and effectively cope with the situation as it did in Mexico City, but it is not a very efficient way of proceeding. This was widely recognized after the earthquake and thus part of the drive to institute planning.

In summary, in this chapter we have described the structure of the organized responses and discussed some of the major tasks that took place during the first two week period of the emergency. Through time, a greater coordination of the effort was achieved through the activities of the DDF and CME. Tasks became more clearly allocated, a more established interorganizational division of labor emerged, and intraorganizational coordination increased. However, the basic nature of the response pattern continued to be a relatively decentralized one, with coordination among units at the same levels and engaged in the same tasks increasing, while overall vertical coordination remained fairly loose.

The overall response was and remained basically decentralized even in the later stages of the emergency period. In this respect, the decentralized pattern was not inconsistent with the regular, day-to-day operations of the DDF. It is a massive and complex organization that normally operates in a fairly decentralized

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fashion.   In this regard the organized response pattern that existed in the aftermath of the earthquake in Mexico City illustrates again the general principle from disaster research that disaster response is often normalized to everyday patterns (Quarantelli and Dynes, 1977), a point we shall return to in our research theme chapter.

PART III. INDIVIDUAL BEHAVIOR

In this part of the volume we present the findings we obtained from the two population surveys.

First, the 1985 findings are presented through a depiction of the earthquake impact consequences for the population, the mass communication behavior of the residents of the capital, the volunteer behavior of the population, and the attitudes and evaluations of citizens regarding a number of the responding organizations.

Second, we follow with a description of the findings from the survey a year later in 1986. Described are the longer run earthquake problems as they were viewed by the population, the attitudes of citizens about the handling of such problems, and what the population had learned from the experience of undergoing the earthquake.

CHAPTER 7.

THE 1985 SURVEY RESULTS ON INDIVIDUAL BEHAVIOR IN THE EMERGENCY PERIOD

In this part of the report we present our major survey findings about the behavior of individuals and to some extent households in the Mexico City earthquake. We first selectively present results from the 1985 survey study.

Four topics are discussed:

> (1) Impact consequences;
> (2) Mass communication behavior;
> (3) Volunteer behavior; and,
> (4) Attitudes and evaluations.

The logic of the presentation is to show how the residents of Mexico City were first directly impacted by the earthquake. In addition to this experience they may have learned from mass media reports certain information about the disaster. Both experiences may have influenced the volunteer behavior of some of the population. In turn, the result of exposure to mass media accounts and of volunteered behavior, may have affected what residents perceived and thought of various persons and groups, primarily in the governmental sector, who responded in the aftermath of the earthquake. As we shall see, only some of these logical possibilities were borne out by the empirical data.

Impact Consequences

a. Overall direct effects.

How much damage and disruption did the earthquake occasion? Such figures as have been reported elsewhere are in almost all cases estimates drawn from limited samples, selective cases, and in many instances just "educated and uneducated guesses" from private and public sources (see various sources cited in the U.S. Embassy report compiled by Bohlen, 1986; and those in Hobeika, Ardekani and Martinez-Marquez, 1987: 2-3). Our survey data, while not perfect, are rooted in a random sample of the population in the way indicated earlier.

The metropolitan area of Mexico City was not physically devastated by the earthquake as any observer on the scene could see, even though a headline in the September 20, 1985 issue of US Today said "much of capital in ruins" (p. 7A). Yet even the

physical damage seems to have been somewhat more extensive than might have been indicated by the considerable public attention given primarily to a very few downtown neighborhoods where some government buildings, several hotels and a few large apartment houses were laid waste, and around which much visible search and rescue took place. In fact, other researchers have noted that while Mexico City may have lost less than two percent of its housing stock, probably two thirds of all buildings which were damaged or destroyed were residential (Pantelic, 1988). Among our survey respondents, 22.6 percent reported some damage and 4.9 percent said there was great damage to the building in which they lived. While the cumulative percentages of affected buildings is a minority of all the structures, the figure of about a quarter of residences suffering some damage from the earthquake translates into several hundred thousand residential structures. (There are over two million buildings in the city).

While an occasional overstatement of building damage has appeared, for example, that "virtually every building in the city suffered some form of foundation failure" (Chandler, 1986: 497), almost all estimates have been in the opposite direction. Thus, published estimates of 30,000 dwellings destroyed, and 70,000 partly damaged (Storlarski and Santa Maria, 1987) would appear to be somewhat underestimations of actual losses. Even far more inaccurate were early published figures that:

> In Mexico City, 5728 buildings were damaged, of which 954 collapsed, 2,177 suffered fractures or structural damage, and the remainder suffered minor damage (as cited in the U.S. Embassy report (compiled by Bohlen, 1986: 2).

Equal understatements were made by the metropolitan zone emergency committee who reported a month after the disaster that there was a total of 5,728 buildings damaged including 3,745 residences, or a German insurance company estimate that 7,400 buildings were damaged of which 770 were total losses, and 1,665 severely damaged (cited in Degg, 1989). Even the President of Mexico in his State-of-the-Union address a year after the earthquake said that "four hundred twelve buildings were destroyed and 5,728 sustained damage" (de la Madrid, 1986: 5). As late as September 1987, US government agencies were still using the figure of 5,728 damaged buildings (e.g., in a report by the National Bureau of Standards entitled "Engineering Aspects of the Sept. 19, 1985, Mexico Earthquake as cited in the New York Times of September 27, 1987 p. 4).

While such figures continue to be cited in the literature even four or five years after the earthquake, there is an explanation of what appears to be serious understatements of destroyed and damaged buildings. As one analysis undertaken three years after the earthquake noted, almost all of the official reports issued did

"not include private buildings which may have suffered damage and were repaired by the owners without reporting them to the government" (Armillas, 1989: 3).

An examination of how many residences suffered some disruption of services of utilities, indicates how widespread was the earthquake impact. The water supply was interrupted in 39.9 percent of all residences. While slightly more than half (51.8 percent) of our households had no phones prior to the earthquake, about 16 percent of those who had prior service underwent disruption of their phones. Again these percentages translate into very large absolute numbers. They are also higher than published estimates of a 27 percent cutback in the water supply and a 5 percent disruption of local telephone services (from different sources cited in Hobeika, Ardekani and Martinez-Marquez, 1987: 2).

The Center combined these and other kinds of impact consequences into a <u>victimization index</u>. Basically we combined damage to house, interruption of electric, water, and telephone services (leaving out those households who lacked any of these services prior to the earthquake), and weighted them a in way so that damage to residence counted more than slight disruption of any of the various utility services. The end result was a threefold scale:

> major victimization = considerable or severe damage to house plus across-the-board disruption of all utility services;
>
> moderate victimization = slight damage to house plus disruption of at least two utility services; and
>
> no victimization = all respondents that did not classify as major or moderate.

The overall results show that while 45.1 percent of our survey respondents could not be classified as earthquake victims according to our index, 49.4 were moderate victims and 5.5. were major victims. That roughly translates to at least one million residents of Mexico City suffering <u>major</u> direct earthquake impact. Viewed another way, about ten million inhabitants of the capital of Mexico were directly impacted by the earthquake. To look at only the relatively few neighborhoods in the center of the city where there was massive physical damage and destruction, misses the disruption of social life which occurred community wide.

Furthermore, our index in no way measured other very disruptive effects. For instance, family life was disrupted for many families because of destruction and damage to over 22 percent of the elementary educational facilities which left hundreds of thousands of children without schools (United Nations Economic Commission, 1985: 10). There were socioeconomic disruptions as the result of

the unemployment of over 150,000 workers who lost their jobs because of the earthquake (Mendez, 1986). There was the disruption of governmental functions and services in that over 125 buildings either owned by state institutions or rented by them were totally or partly destroyed and had to be evacuated; these included the headquarters of the Ministries of Commerce and Industrial Promotion, Labor, the Navy, Agrarian Reform, and Communication and Transportation, among others (United Nations Economic Commission, 1985: 11).

But even just limiting ourselves to damage to residence and/or interruptions of certain household utility services, our data show that more than half of the residents of the city were directly affected by the earthquake. To be sure, because of the vastness of the metropolitan area of Mexico City, there were inhabitants who did not become aware for up to 12 hours after impact that an earthquake had occurred. However, in terms of the personal disruption of everyday life, a majority of the population, in the millions, were directly impacted to some degree.

Unfortunately, for technical reasons, the information we obtained on deaths and injuries among the surveyed households cannot be accepted at face value. However, our data suggest that a total casualty figure of around 130,000 may be reasonable (with the great majority of the injuries being very minor; this is consistent with some reports that at least 53,000 persons were treated at more than 280 on-site first aid stations and other facilities). Deaths probably did not constitute more than ten percent of the overall total. Published estimates and some official reports of the dead have given inconsistent figures ranging from 4,000 to 30,000 (Lopez, Lopez, and Cejudo, 1986) and even higher unofficial figures of 45,000 dead (Hamilton, 1986: 6); the higher figures are almost certainly incorrect. Nevertheless, as others have noted, the loss of life given the physical damage was both percentage wise, and in absolute numbers, surprisingly low (Palacios et al., 1986: 279).

b. Social class differences.

As has been long known to disaster researchers, disasters do not impact equitably on people and communities; some sectors always suffer more. This was true in Mexico City.

We found that the direct effects of the earthquake were not equally distributed at the social level when differentiated by social class. According to our victimization index, while upper class (UC) respondents suffered the least, middle class (MC) persons were more affected than working or lower class persons (LC). For example, 7.7 percent of our MC sample scored high on our victimization index compared with 4.2 percent of our LC individuals. In terms of being moderate victims, there again were more MC than LC affected, the respective figures being 60.5 percent to 45.8 percent.

In some cases, although not all, social class is associated with disruptions of certain lifeline services. While electric power and phone interruptions more or less cut across social class lines, considerably more MC (53.5 percent) than LC (34.9 percent) respondents had disruption of their water services, while only 5.8 percent of UC individuals reported they had such interruption.

It is often said that LC segments of a society suffer most in disasters. This is only partly supported by our findings. At least as measured by the indicators we could use, there were proportionately more MC victims than LC victims in the Mexico City earthquake (While we do not report other figures here, other variables often correlated with socioeconomic levels, such as education and occupation, are consistent with our finding of social class differentiation in impact consequences, whereas sex and age variables normally not correlated, did not show any significant differences). Of course, since the LC strata is bigger than the MC one, in absolute numbers there were more lower class persons affected directly by the disaster than middle class individuals.

There are at least two possible explanations for the relative greater MC losses reported in the disaster than for our LC respondents. Unlike in certain places around the world where, for example, lower socioeconomic strata persons live in flood plains or near active volcanoes, there were few settlement trends in Mexico City to push them into the earthquake prone areas. In fact, given the ecological and land use patterns of Mexico City, middle class persons were more likely to reside near the cultural, social and political centers of the city which as it turned out, were nearer or on the ancient lake bed which appears to have amplified the intensity of the ground shaking and increased the duration of the shaking at the time of impact (see the discussion in the special issue of Networks Earthquake Preparedness News, 1986: 3).

Also, it is possible that the survey results obtained may partly be an artifact of the situation involved--many LC strata persons in Mexico City had very poor housing on an everyday basis, living in dilapidated structures or buildings. The earthquake may not have noticeable created new cracks in the walls, sagging floors, or making doors or windows illfitting in LC houses, whereas such damages would have been far more noticeable and reported in the normally better kept residences of MC individuals. Also, while we have no direct data on the matter, there was an estimated pre-earthquake deficit of 60,000 housing units in the city, (Pantelic, 1988) presumably involving people from the lowest socioeconomic strata. If many of these people were living in the streets rather than houses, they could not suffer housing losses.

Although Mexico as a whole is a developing country, the population of metropolitan Mexico City has substantial access to mass media outlets. In our sample, about two thirds (67.1 percent) had at least one black and white television set and 41.1 percent had at least one colored TV set. (In the survey a year later, 77.8 percent reported owning a black and white set, 41.7 percent a colored set.) Normally there are seven television stations operating in the city. Radio sets are so widespread that ownership is seldom enumerated in surveys. Listeners have a choice of listening to at least 57 stations. There are also more than two dozen newspapers available, although functional illiteracy may be as high as 20 percent.

The earthquake did little direct damage to the mass communication system, except for the private television network. But while the main studio of the private television system, TELEVISA, was severely damaged, its signal transmission was resumed within about four hours (Robinson et al., 1986: 97). The state television system, IMEVISION, continued to use channels 7, 11, 13 and 22 to telecast. Radio stations and newspapers for the most part were able to operate normally.

a. General usage.

In general, the picture that comes across from our data is that there was massive use of the mass media. We have no directly comparable data on normal usage. However, it would appear that the population exposed itself to mass communication content even more than it does on an everyday basis.

Particularly given the situation many residents of Mexico City found themselves on the day of the earthquake, there was very heavy usage of the mass media. For example, on the day of the earthquake only 37.2 percent of our respondents did not listen at all to a radio station (some of this probably is accounted for by the nearly 5 percent of the population whose residence suffered great damage and some more also lost electric power). While three stations each drew more than 10 percent of the listeners, all stations had some audience. Somewhat more surprising, over half of our respondents (54.7 percent) watched television sometime the day of the earthquake. In contrast to radio listening, it is noteworthy that nearly half of the viewers (49.7 percent) watched only one TV channel and another 6.8 percent watched that same channel in addition to another channel. But it is not unexpected that only 16.4 percent read a newspaper that day; this may not be far from the daily norm.

Of those that listened to radio, 28.7 percent said they listened in total more than eight hours that day. In fact, only 29.2 percent of the listeners said they heard radio broadcasts only two

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hours or less. Of those that looked at TV, 27.5 percent watched eight or more hours! Newspaper readers read many papers not particularly concentrating on just one, two, or three.

Victims were somewhat more likely to listen to radio rather than to watch television after the earthquake. For example, high post-impact radio usage was reported as follows: non-victims according to our index (36.6 percent), moderate victims (51.1 percent), and major victims (12.6 percent). Television usage was respectively 46.8 percent, 42.8 percent, and 10.4 percent. Other data indicate that radio was the major source of information for more than 60 percent of our respondents.

b. Attitudes towards television coverage.

Were the audiences satisfied with what they obtained in their exposure to mass media reports? We did not ask this specific question directly. However, we found little expression of dissatisfaction on such matters as incompleteness of coverage, sensationalism of content, or failure to provide helpful information. We will document this specifically with respect to use of television content, but the same general picture also holds true for the radio audiences.

Viewers of television were asked their views about different aspects of the coverage of the earthquake. About a fourth (25.7 percent) of the survey population characterized the coverage as incomplete but nearly a third (32.3 percent) thought it was complete and the rest fell in between. Barely 15 percent of our respondents thought that the coverage was sensationalized in any way. Only about 28 percent indicated that the TV telecasts failed to provide much guidance or direction. Our survey respondents made little distinction between the disaster coverage by the private and by the government television networks.

We found little when we analyzed the views of those who thought television coverage was incomplete, sensational or nondirective. For example, there were almost no social class differences regarding the incompleteness of the TV coverage. Similarly there were no clear cut significant differences in terms of such variables as gender, age, marital status and similar demographic dimensions; the same was true with respect to our victimization index. In fact, about the only difference on the completeness of TV coverage of the earthquake was with respect to usage of TV; less frequent users compared to moderate and high users thought the coverage more incomplete (40 percent versus 29 and 27.9 percent).

UC respondents did see TV as being slightly more sensationalized than did MC and LC persons. So did men as well as those who were most victimized. However, because so few saw TV coverage as being sensational, the figures involved are quite small and probably not significant. LC and UC respondents also did see television as

being more directive, that is, providing guidance or useful information, than did MC individuals, but here too the numbers involved are rather low.

Women compared with men as well as younger respondents also saw television as being more directive but the differences again were not substantial. However, interestingly, more of those who were most victimized saw the television coverage as proving more orientation than those who were only slightly victimized or not victimized at all (respectively, 38.3 percent compared with 25.9 and 22 percent). This would seem logical since such persons would presumably need the most guidance or helpful information.

It is perhaps significant that at the time of the first survey, about two weeks after the earthquake, nearly a third (31.8 percent) of the respondents said they would just as soon hear less news about the consequences of the disaster. This could be interpreted in a variety of ways. But this along with the other matters we have just discussed would suggest that on the whole viewers were satisfied with how television reported after the earthquake. Even when asked what more information they wanted to know---and although about two thirds of the respondents mentioned something---few things were particularly singled out and only two questions received more than ten percent mention (16.6 percent wanted to know if there might still be survivors and 14.9 percent wanted to know what was going to be done with the homeless). Those respondents most victimized by the disaster did not appear to have a different set of attitudes about television coverage as a whole, than did non-victims.

Volunteer Behavior

The popular wisdom holds that the "mass assault" during the earthquake was of immense proportions. Mexican officials and the general public have pointed with pride, and outside observers with a degree of amazement, at the presumed outpouring of volunteer activities in the immediate post-impact period. This massive voluntary effort seemed to be verified by the sights and sounds of television news tapes; around the world viewers saw at least scenes of extensive and long lasting search and rescue efforts.

How accurate this image of mass volunteering is depends on what one takes as the base for the answer. As can be observed in Table 1, of 2,966 individuals about whom we have information from our survey, 290 or 9.8 percent engaged in some kind of volunteer action at some time during the nearly three weeks subsequent to the disaster impact. Conversely, 90.2 percent of the sample undertook no disaster related tasks or volunteered in any way.

Therefore, the image of massive citizen emergent actions seems to be questioned, since only about one in every ten residents of Mexico City participated. But it is necessary to consider the

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population base of the metropolitan Mexico City area. If that is taken into account, the 9.8 percent translates into over 2,000 000 volunteers (and depending on what is taken as the actual population of Mexico City, the figure may be over three million), a rather massive response by any standard! It should be noted, furthermore, that these statistics refer to the total population of Mexico City and include all age categories. If children under the age of 12 are excluded from the sample, the subsequent percentage of those volunteering rises to 12.4 percent, or almost one of every eight adult residents.

Table 1: Factors Related to Volunteering

| | Volunteers | | Non-Volunteers | |
	N	%	N	%
Total Sample	285	9.8	2,637	90.2
Gender (a)				
Male	192	13.2	1,259	86.8
Female	93	6.3	1,378	93.7
Age (b)				
Under 12	3	0.5	642	99.5
13-17	28	6.2	431	93.8
18-29	136	17.3	650	82.7
30-44	77	14.7	450	85.3
Over 44	40	7.9	461	92.1
Location (c)				
Far	155	7.6	1,883	92.4
Middle distance	84	14.6	490	85.4
Near fringe	34	15.1	193	84.9
In damaged zone	11	13.7	71	86.3
Socioeconomic status (d)				
Upper class	57	25.7	165	74.3
Middle class	129	11.7	978	88.3
Lower class	98	6.2	1,494	93.8

a) Chi square=38.66879   Total N=2,922
b) Chi square=137.31914   Total N=2,918
c) Chi square=34.89207   Total N=2,921
d) Chi square=92.13635   Total N=2,921

Published reports that volunteers numbered around 50,000 (Hobeika, Ardekani and Martinez-Marquez, 1987: 3 citing a Japanese report about volunteering in the immediate aftermath of the earthquake) would appear to have underestimated the total, given that 41.9 percent of our respondents who volunteered said they worked at

search and rescue. In fact, practically every estimate on volunteering which tried to attach numbers to the activity fall considerably short of the figures we found. The highest we found in the literature was "one million volunteers" (Perez, 1987: 3).

a. Kinds of volunteer activities.

A wide range of different tasks were undertaken. They ranged from search and rescue and debris clearance to collecting food and other supplies and money, to transporting goods and material. Other volunteers served as translators for the foreign relief workers, helped to inspect buildings, provided psychological counseling, donated blood, assisted security personnel, and provided various kinds of medical help. Still others opened their homes to victims forced out of their own residences.

For descriptive and analytical purposes, the full range of activities have been collapsed into seven categories, as shown in Table 2. From this it can be seen that most volunteers either engaged in search and rescue, or helped in the procurement and processing of supplies. A little more than 75 percent of all volunteers undertook these tasks. Some help in providing medical aid and psychological counseling was given by nearly eight percent of the volunteers. About four percent either provided transportation or assisted in the collection of money for victims. Another three percent helped to house and shelter evacuees (but see our later discussion of the housing and sheltering of evacuees). The remaining ten percent engaged in a broad range of different activities, none of which individually involved more than 1.8 percent of the volunteers.

Table 2: A Comparison of Volunteering By Gender

Tasks	Men N	%	Women N	%	Total N	%
Search and rescue	98	52.3	19	20.5	117	41.9
Provision of supplies	49	26.2	44	48.6	94	33.5
Medical/psychological aid	11	5.9	11	11.9	22	7.8
Transportation assistance	8	4.2	3	2.8	10	3.7
Shelter and housing aid	3	1.5	6	6.2	8	3.0
Collecting funds	3	1.6	2	2.3	5	1.8
Other assistance	16	8.4	7	7.8	23	8.2
Totals=	188		91		279	

Chi square=31.86

The great majority of volunteered tasks involved more than minor expenditures of time. Nearly half or 45.2 percent, of the volunteers worked at least four days or longer. A relatively substantial number, 17.6 percent, spent at least 10 days or longer on earthquake related tasks. In terms of daily time, 44.9 percent of those who volunteered said they had worked at least an average of nine hours a day, and 22.1 percent claimed that they had put in an average of 17 hours each day (some tasks such as housing evacuees in one's own home could be seen as round the clock or 24 hours a day work). The Instituto in a separate analysis concluded that the volunteers--estimated to be around 1, 700 000 individuals that were 12 years or older--provided considerably over 40 million helping hours (Garnica, personal communication).

b. Characteristics of the volunteers.

After the Mexico City earthquake, certain political circles, some press accounts, and popular discourse suggested that the typical volunteer was a resident of the impacted area, poor, male, and young (for the last, see the United Nations Economic Commission, 1985: 6 where it is said "private citizens, especially young people, organized themselves spontaneously"). On the other hand, other ideologically oriented Mexican observers have argued that the citizenry as a whole volunteered (e.g., the volunteers spanned "the city's disparate social classes", Robinson, Franco, Castrejon and Bernard, 1986: 91). Our data indicates that the volunteering pattern was much more complex than implied in these two points of view.

For example, what was the social class composition of the volunteers? There were some notable differences. For instance, the greatest number of volunteers---46.2 percent---were middle class persons. Somewhat less, 34 percent, were from the lowest socioeconomic strata. The rest of the volunteers---19.8 percent---were upper class individuals. Furthermore, as we shall later discuss, an even more sharply differentiated pattern according to social class is present when these figures are compared to the actual social class distribution of the population as used in the survey by the Instituto.

Likewise, only 4 percent of the volunteers were from immediately devastated neighborhoods with another 12.3 percent from nearby fringe areas surrounding those zones. A majority, 54.4 percent resided far from the centers of destruction. This observation applies to volunteering as a whole; some specific tasks such as the providing of supplies appear to have been more neighborhood based. There was no direct relationship between distance from impacted neighborhoods and search and rescue, but the picture is confounded by the fact that no differentiation was made in the survey between earlier and later search and rescue (there are reasons on other grounds to think that the great majority of the early search and rescue was undertaken by those in the immediate

neighborhoods impacted; see, for example, the case material presented in Durkin et al, 1987: 10).

On the issue of age, only about in ten of all volunteers were 17 years or younger. This too challenges the general impression. In fact our data is only supportive of the idea that volunteers were primarily male; about two of every three volunteers were men.

If we confine our analysis to the smaller individual sample (n=527) rather than the household sample (n=2,966), the same general pattern is present. Men volunteers outnumbered women about two to one. Those within the age category of 18-29 were the most numerous with those below 18 years being the fewest. Those residing further away from impacted neighborhoods were more likely to volunteer than those closer to or within those areas. Thus, the overall pattern of the smaller individual sample also challenges popular notions that volunteers were overwhelmingly poor, the young, and from within impacted areas.

c. Background factors related to volunteering.

What background factors were associated with volunteering? We particularly examined social class background, gender, and age. Consistent with what we have just reported about the social characteristics of the volunteers, these background factors also showed a differentiating pattern.

Using the larger sample again, we found socioeconomic status was positively associated with volunteering. Among the UC , 25.3 percent participated although we shall later note that this is differentiated with respect to the task involved. Whereas only about 11.8 percent of the MC respondents volunteered, even less (6.2 percent) of LC individuals undertook volunteer tasks (this is statistically significant--gamma = .431 P = <.001; r = .158, P = <.001). Put in more general terms, among the general population LC individuals were least likely to volunteer, while UC persons volunteered the most; those in the MC fell in between. In fact, according to our smaller individual sample, individuals from UC households were three times as likely to volunteer as those from LC households. Similarly, according to an analysis made by the Instituto, UC households were disproportionately represented among volunteers whereas LC households were considerably below what would have been expected if volunteering had directly reflected the social class distribution of the population in Mexico City (Garnica, personal communication).

Gender also makes a difference overall. About 13.2 of males engaged in volunteer disaster tasks. Only 6.4 percent of females in the population volunteered (gamma = .382, P = <.001).

Age is also significantly related to volunteering. But the relationship is curvilinear. The lowest range of participation

was among those 17 years of age or younger; 11.3 percent of them undertook any disaster-related tasks. However, participation increased dramatically among those 18-29 years of age; 48.1 percent of the individuals in this age category volunteered. Volunteerism was also above average for those 30-44 years of age. About 26.6 of such individuals volunteered. Finally, the rate of volunteering decreased for those over 44 years of age. It drops to 14 percent which however is somewhat above that for the youngest age category in our sample.

In general, volunteering was concentrated most among those with UC and MC background, young adults to middle age individuals, and male persons.

We also examined other possible differentiating background factors for volunteering. These included household distance from impacted localities, educational attainment, occupational status, and kind of volunteer task undertaken. The analysis indicates that these features were not as significant as the social class, gender and age factors we have just discussed. The exception to this was educational background but of course that is highly correlated with social class standing.

Except for those who lived a great distance from the destroyed neighborhoods, distance (as it was estimated in the survey) is not a significant differentiating factor. For those who lived in impacted neighborhoods, near those areas or at a moderate distance, between 14.7 and 15.9 percent volunteered. Among those who lived far from any of the devastated localities, 7.5 percent participated in some volunteered task.

In addition, while there was no significant relationship between occupation and volunteerism, there was a partial positive one between education and volunteering (see Table 3). Those with an incomplete secondary education or less volunteered at rates between 4.1 percent and 10.6 percent. However, among those with complete secondary education or preparatory education (either complete or incomplete) the range was 17.7 percent to 33.9 percent. Those with professional and post graduate training volunteered between 27.7 to 65.1 percent.

In order to determine the independent effects of gender, social class, age, location, occupation and education upon volunteering for earthquake related tasks, a statistical regression analysis was performed. Thus, we found that volunteering is related to social class and education, although the latter appears to be the stronger independent influence. Similarly, gender is strongly related in that men were more likely to participate at the rate of about two to one more than were women. Finally, age is a statistically significant factor.

Table 3: Comparisons Of Volunteers and Non-Volunteers By Educational Levels

Educational Level	Volunteers % N=93	Non-Volunteers % N=434
No schooling	4.1	95.5
Primary, incomplete	10.1	89.9
Primary school complete	5.2	94.8
Secondary, incomplete	10.6	89.4
Secondary school complete	17.7	82.3
Preparatory, incomplete	25.1	74.9
Technical	20.7	79.3
Professional, incomplete	33.8	66.2
Professional school complete	27.7	72.3
Post graduate schooling	65.1	34.9
Total =	17.6	82.4

Chi square = 43,30088

Although there was participation from all social classes and social categories examined, volunteering was most likely to be found among those with substantial education, among those from the higher socioeconomic strata, among males, and among those 18-44 years of age.

Clearly not everyone volunteered; it did not occur across the board. This shows up when looking at volunteering in general. But was there any differentiation in different kinds of volunteer activities? It appears that several factors influenced participating in different earthquake related tasks.

What of these factors influenced who did what? Social class was a factor. Among UC volunteers, only 24.6 percent undertook search and rescue, while the corresponding percentages for MC and LC volunteers were 38.4 percent and 56.6 percent respectively. Conversely, UC individuals were more likely to volunteer for the processing of supplies (41.3 percent) than were those from the MC (38.4 percent) or the LC (22.6 percent). The overall relationship was statistically significant (Chi Square = 22.47563 df=12 sig.=.0325).

However, the strongest observed relationship was between gender and type of volunteered activity. The results are presented in Table 2. Men were significantly more likely to engage in search and rescue and debris clearance than were women (52.3 percent as opposed to 20.5 percent). On the other hand, women were more likely to be involved in the collection and processing of food,

clothing and other supplies (48.6 percent as compared with 26.2 percent of men). Part of this would seem to be reflective of traditional sex role patterns in a Latin American culture, although some of it might also result from the very heavy manual labor requirements of much debris removal and search activity.

A regression analysis was carried out in order to examine the influence of gender, age, socioeconomic status, occupation, education, and location vis-a-vis the most impacted localities within the city, upon the type of help provided by the volunteer. We found no strong, independent and statistically significant relationship to the type of disaster task undertaken.

Likewise, an examination of mass media usage found no direct relationship to degree of volunteerism. That is, heavy media users for instance were not necessarily high on volunteering. In fact, low media users (52.1 percent) were more likely to volunteer than high media users (38.9 percent). Perhaps this simply means that respondents who were involved in doing emergency tasks had less time to hear, see or read mass media accounts of the disaster.

One aspect about the volunteering behavior is not well caught by the above analyses. There were to be sure many individual volunteers, persons who came as individual persons to a scene or a place to provide spontaneous help. However, especially the further away from impact time, many of the volunteers were _group_ volunteers, that is, they came to participate in disaster related tasks as members of particular groups (e.g., as a result of being members of unions or neighborhood associations, which are quite numerous in Mexico City with some governmentally organized and others by political opponents of the regime). In addition, as we described when depicting the general organizational response earlier, there were many volunteer work brigades from different government agencies and bureaucracies. For example, 53 work brigades were formed just in the Ministry of Urban Development and Ecology (Perez, 1987: 5). So in some respect there was as much of a "group" assault as a mass assault on the immediate disaster problems--an observation we drew from other than the survey data (see our later discussion of this issue in chapter 10 on similarities and differences between the United States and Mexico in disaster responses).

Attitudes and Evaluations

a. Problems.

While respondents in the survey mentioned many issues that they thought the Mexican government ought to address immediately after the earthquake, only two problems were mentioned by ten or more percent of those answering. Nearly forty percent (38.3) singled out most of all the problem of housing the homeless--which a number of all respondents (21.1 percent) thought preexisted the earthquake

but was magnified by the disaster. Trailing far behind as the second most mentioned problem was the lack of water and other services in some neighborhoods (13.3 percent).

Now relatively soon after the earthquake, there were some public demonstrations. On September 27, at least several thousand victims from various affected city neighborhoods demonstrated to protest the lack of governmental help and to ask that victims be allowed to use buildings which were still habitable. An even larger number of persons took part in a march on October 2 from the Anthropology Museum to the Independence Monument to demand that there be a rapid response to the problems of victims. But some such public protests may have stemmed less from individual reactions to the consequences of the earthquake as to the opportunity presented by the disaster for opponents of the regime to make a political statement. As an official from one group in such a position said:

> Even before the quake there was a group called the Tenant's Coordination. That was why our response was so fast because we were already organized and we had the neighborhoods coordinated. All these organizations formed the nucleus of the victim's organizations. As soon as the quakes ended, the Coordination called the first march to the courts.

However, given these street demonstrations and what might have been expected because of the magnitude of the disaster, the survey findings are somewhat surprising. A more frequent singling out of a number of earthquake related problems might have been anticipated. (That the findings are not a function just of the fact that the population survey was done within the first three weeks after the earthquake is supported by the observation that a year later, relatively few problems still were mentioned--as we shall discuss in the second section of this part of the report on the 1986 survey results).

There were no social class differences in the focus on the two mentioned problems. But those who scored highest on our victimization index particularly saw the problem of housing the homeless as important (66.1 percent to 36 percent for all others). This is hardly surprising since the most victimized were those who had suffered as a minimum, considerable damage to their own homes. Exposure to mass media stories did not seem to have any direct effect on singling out the homeless problem, except that those who thought television coverage was sensational were more likely to do so.

Given the relatively few problems that were singled out, it is not surprising that overall there was a generally positive assessment of governmental actions (or at least absence of much negative criticisms); of our respondents, 46.3 percent were positive, 47.5

percent were neutral, while only 6.2 percent were negative. Given mass media reports and specific criticisms of particular groups, both Mexican and foreign, this might seem to be a very low figure.

Here again, a very low percentage figure translates into large absolute numbers--over a million residents in the Mexico City area had primarily negative views of the immediate post impact response to the disaster. But from a statistical viewpoint, nevertheless, the great majority of Mexican citizens were not critical of what the government had immediately done generally in responding to the disaster. The concern, discussed earlier under organizational preparations for and response to the earthquake, that victims might become very negative towards the Mexican government is not supported by our survey data.

b. Assessment of five key groups.

We examined how our respondents assessed five of the principal responders in the aftermath of the earthquake: the Mayor's office (DDF), the army, the police, the President of Mexico, and the volunteer groups. (As to the last, no distinction was made in the survey between foreign and domestic volunteers).

Overall what stands out is the general favorable assessment of all the entities--groups or persons. As the following table shows, in general terms, even the most unfavorable viewed group, the army or military, received a 64.1 percent positive evaluation. The most positively viewed were the volunteer groups. Even when the responses were broken down into different dimensions such as appropriateness of response, its timing, how well it was organized, and if it was done in a compassionate way, the great majority of our respondents in all cases were positive or favorable. In fact, as Table 4 shows, the evaluations of specific dimensions did not vary very much from the overall attitude expressed about the responding entities.

Table 4: Negative Attitudes Toward Different Activities of Responders

	%
The police: Overall negative evaluation	35.9
Acted in a nonhumanitarian or noncompassionate way	35.7
Acted inappropriately	35.9
Acted in a disorganized way	35.8
Timing of actions were poor	32.5
The military: Overall negative evaluation	32.1
Acted in a nonhumanitarian or noncompassionate way	33.8
Acted inappropriately	35.9
Acted in a disorganized way	30.1
Timing of actions were poor	30.0
DDF: Overall negative evaluation	17.0
Acted in a nonhumanitarian or noncompassionate way	17.3
Acted inappropriately	20.6
Acted in a disorganized way	20.3
Timing of actions were poor	18.3
President: Overall negative evaluation	10.5
Acted in a nonhumanitarian or noncompassionate way	9.2
Acted inappropriately	14.4
Acted in a disorganized way	12.5
Timing of actions were poor	11.1
Volunteers: Overall negative evaluation	5.2
Acted in a nonhumanitarian or noncompassionate way	6.0
Acted inappropriately	6.1
Acted in a disorganized way	11.0
Timing of actions were poor	7.7

Clearly the two most negatively viewed groups were the military or army, and the police. They were just about the only organizations who were specifically named by respondents who volunteered names of who acted badly (over one in ten mentioned one or both of these groups). For example, 35.7 percent of our respondents saw the police as being noncompassionate or not humanitarian in their response to the disaster; 35.8 percent perceived them as being disorganized; 32.5 percent thought their timing was poor, and 35.9 percent saw them as not acting in appropriate ways. There was a high correlation between having an unfavorable evaluation on one dimension and on other dimensions. The expressed views about different dimensions of the actions of the military were almost as

unfavorable as that about the police. There was however a substantial drop regarding specific negative views of the DDF, the President, and especially the volunteers. Again, the earlier expressed concern that the President might become the focus of negative views by disaster victims is not supported by our survey data.

c. Background factors.

A variety of simple and complex analyses were made of various background factors which might have influenced attitudes towards the five entities for which an evaluation was requested from respondents. Because of the relatively few negative views that were expressed overall, almost all the cell numbers involved are very low and not subject to any reliable interpretation. But to the extent we could make any analyses, such factors as age, education, gender, occupational status, socioeconomic category, mass media usage, degree of victimization, etc. did not seem to be the prime factors in affecting the unfavorable attitudes expressed.

We particularly attempted to analyze what might be associated with negative attitudes toward the two organizations that were most critically viewed, that is, the military and the police. There were some slight tendencies for men more than women, and LC respondents more than MC ones to be negative on certain matters. For example, 36.1 percent of men compared with 28.1 percent of women viewed the military negatively. Also, heavy media users (45 percent) compared to light media users (27.6 percent) were negative of the military. Not surprisingly those with a more general negative attitude toward what the government had done after the earthquake, tended to be somewhat more negative with respect to specific activities by specific entities. But even these figures might represent more normal sampling fluctuations than actual differences. Overall figures tend to support this interpretation. For example, 31.1 percent of LC respondents, 33.1 percent of MC and 33.9 percent of UC respondents viewed the military in a negative one--essentially there were no social class differences. The negative views of the police are about the same with the respective percentages being 34 percent, 38.4 percent and 35.1 percent.

Those who volunteered did not generally have a more negative attitude than those who did not, with respect to the military or the police (or the President of Mexico). This might suggest that contacts with the police and/or military in the aftermath of the disaster, as could possibly have been the case by volunteers, did not affect the evaluations. On the other hand, volunteers did have a significantly more negative view (at the .01 level) of the Mayor's Office than did nonvolunteers. This suggests that contact with the group might have affected the attitudes of the volunteers. Not surprisingly, volunteers had more favorable views of volunteer groups than did nonvolunteers.

But overall, whatever was responsible for the differences in positive and negative evaluations of what we studied was not particularly accounted for by what we examined. The reasons for the differences laid in other than the primarily demographic dimensions that were available to us for examination. We suspect that the negative views about the military and the police may have resulted more from pre-disaster attitudes rather than a reaction to what those two organizations may or may not have done after the earthquake (this is supported by predisaster studies of the Instituto which found that the military and the police obtained the lowest marks in an "institutional trust index" used in various surveys, Garnica, personal communication).

But even this last suggestion may be too simple an explanation. For example, there was a somewhat curvilinear relationship between mass media usage and negative attitudes toward government organizational activities after the earthquake. Low and high media users tended to be more positive, whereas moderate users were more likely to have an unfavorable view. For example, low media users and high media users evaluated the actions of the Mexican military more unfavorably (15.7 percent and 32.4 percent respectively) than did moderate media users (51.9 percent). Similarly, with respect to appropriateness of police actions; the respective percentages were: low users (16.3 percent), high users (33.5 percent), and moderate users (50.2 percent). Now it is difficult to believe that low and high mass media users saw different content about the military and the police. But the curvilinear relationship found must also be attributable to other factors and beyond a generalized negative views of the two organizations involved.

These were the reported reactions and attitudes in the first three weeks after the earthquake. Did any changes occur in the year subsequent to the disaster? We now turn to a present of our findings of the second survey.

CHAPTER 8

THE 1986 SURVEY RESULTS ON INDIVIDUAL BEHAVIOR IN THE YEAR AFTER THE EARTHQUAKE

In this part of the volume we present our major survey findings obtained a year later, that is, around the anniversary of the disaster. As in the 1985 survey, the 1986 one focused on the behavior of individuals. While a few questions were repeated from the earlier survey (and practically all the background questions), most of what was asked was new (see Appendix III for 1986 survey questions).

Three topics are selectively discussed:

(1) Longer run earthquake problems;
(2) Attitudes about the handling of earthquake related problems; and,
(3) Learning from the earthquake.

The logic of this presentation is as follows. It was assumed that the population had views about the shorter run problems that emerged as a result of the disaster and/or the longer run problems that appeared. Given these views about problems, we wanted to analyze their attitudes on how earthquake related problems were handled. In turn, we were interested in seeing what those who had undergone the earthquake thought they had learned from the experience, both in the short run and the long run.

Longer Run Earthquake Problems

a. Disruption of utilities.

In the first survey, many had indicated suffering disruptions of utility services immediately after impact. Similarly, our respondents in the second survey said they had difficulties in the same services in their homes in the year following the earthquake. For example, when asked directly if there had been problems, 31.9 percent of them reported interruptions or cuts in the water supply, 24.4 percent in telephone service (a figure that almost doubles when only those who had the service are considered), 22.3 percent in electric power, and 8.1 percent in mail delivery. LC and MC respondents had considerably more difficulty with the water supply than UC ones (respectively 31.4 percent, 33.3 percent and 12.5 percent). However, it is very important to note that when allowed to volunteer or choose themselves what problems they had experienced over the year, very few singled out problems in such

service deliveries (although the question was asked with respect to the entire city and not just the household). For example, no one mentioned as requiring immediate attention the disruption of electric power, and only one percent mentioned the phone service and but 3.4 percent difficulties with the water service!

In fact, the government was ranked very high on its handling of two of the interrupted services: thus, 56.6 percent thought the restoration of phone service was handled very well or well--only 3.3 percent thought it was handled very poorly; 54 percent said the restoration of the water service was handled well or very well with only 1.6 percent saying it was handled very poorly. The telephone company itself also received high ranking as to how well it was organized and its compassion for victims. A clear majority (53.2 percent) said it was now more organized and could react better to a future disaster. Clearly service disruptions of the kinds indicated were not a major source of dissatisfactions or complaints. That victims were not particularly disturbed by difficulties with the utility services is indicated by the fact that those who suffered the most disruptions were no more likely to have participated in disaster-related activities in the year after the earthquake than those who had no such problems.

It is also possible that the disruptions were not that important in the thinking of most residents, possibly because residents of Mexico City are accustomed to some irregularities in such services. In fact, in answering several different questions our respondents tended to observe that the earthquake had made pre-impact problems worse than before rather than that it created new ones (15.3 percent explicitly volunteered this idea, and 85 percent of our respondents said yes when asked directly if the earthquake had magnified previously existing difficulties and problems).

b. Other singled out problems.

As can be seen in Table 5, when respondents were asked a year after the earthquake what was the major problem most needing immediate attention, a wide variety of matters were mentioned. However, it is fairly clear that respondents did not always distinguish between earthquake related and other more endemic problems in Mexico City. Thus, it is not surprising that the three most singled out problems were housing (68.8 percent), restoration of schools and hospitals (6.1 percent) and unemployment (4.6 percent), with 21.2 percent saying that the earthquake made the housing shortage worst, and 14.5 percent saying the same about unemployment.

Put another way, even when certain problems were noted, many of our respondents did not make a sharp distinction between what was considered normal on an everyday basis and what might have been aggravated by the disaster. Consistent with this, nearly three out of five respondents (59.5 percent) felt the earthquake had made the economic crisis worst; a situation which in many ways Mexicans as

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a whole considered to be a far more continuing and serious national problem than even a major, but one time, disaster in the country's capital.

Table 5. Major Problem Needing Most Immediate Attention

	%
Housing	68.6
Restoration of schools and hospitals	6.1
Unemployment	4.6
Water service	3.4
Reuse of space	2.6
Building reconstruction	1.9
Construction rules	1.6
Economic losses	1.3
Plans for the future	1.3
Medical care	*
Food for victims	*
Adoption of orphans	*
Distribution of money	*
Phone service	*
Street repair	*
Decentralization	*
Inflation	*
Need more private enterprise	*
Loss of documents	*
Public services	*
Health services	*
Lack of communication	*

* less than 1%

Here as well as elsewhere, there were also social class background differences, not all of which are self explanatory. For example, of those who mentioned it, 85.9 percent of the MC strata compared to 77.3 percent of the LC strata named the housing problem. LC persons (22.6 percent) were more inclined to note the problem of schools and hospitals than MC (13.2 percent) or UC (9.8 percent) individuals. Unemployment, when mentioned, was very slightly noted more often by the MC (24.7 percent) than by the UC (22.5 percent) or the LC (20.8 percent) respondents. More LC respondents (43.5 percent) than MC (37.7 percent) or UC respondents (35.6 percent) saw the disaster as affecting the economic crisis even more negatively.

c. Sheltering and housing activities.

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We particularly looked at the question of earthquake related sheltering and housing since it was singled out as the major post recovery problem. While, as shall be seen, the details of our findings are complex, several themes run through them. Large, absolute number of residents moved from their homes in Mexico City in the year after the earthquake. While much of the moving seemed linked to the disaster, the relationship was often not a direct one. Neither movers nor hosts had many negative views about the problem; in fact, nonmovers tended to have somewhat more unfavorable attitudes about the handling of the problem.

Let us now detail some of these more general themes. For example, about 10 percent of all respondents claimed that in the year after the earthquake they left their own homes, at least temporarily, to live elsewhere. Nearly 85.5 percent of these leavers went to relatives; another 5.1 percent to friends. Middle class persons, followed by lower class individuals and then upper class persons were more likely to stay with relatives than friends. Public mass shelters were used almost exclusively by people from LC strata. This last is a pattern that has often been noticed in other disasters.

Psychological and/or economic factors may have been more important than a physical inability to use their own residences for those that relocated after the earthquake. This observation is derived from the fact that only 15.2 percent said they made a move because their own home was severely damaged or destroyed. This finding also has to be seen in the context of the previously noted fact that even prior to the earthquake of 1985, there was a deficit of about 60,000 housing units in Mexico City (see Pantelic, 1988). Nonetheless, in absolute numbers, for whatever reason, about two million residents of Mexico City left their homes for some time and that move was in some way related to the earthquake. If we use our figures, published estimates of 500,000 homeless as a direct result of the earthquake may have been an overestimation in terms of a physical necessity of a move, but an underestimation of the number of persons who left their homes for a period of time after the earthquake.

The duration of the move also was longer than might have been anticipated. While 27.2 percent of those who moved stayed elsewhere less than two weeks, 60.6 percent remained up to a month. However, only 7.2 percent remained elsewhere more than a month. Translated into absolute numbers around one million two hundred thousand people moved elsewhere for up to a month as a result of factors associated with the earthquake. But these data are not supportive of a Red Cross report a year after the disaster that 100,000 people were still without permanent homes (Hamilton, 1986: 6).

However, our figures of over a million persons moving elsewhere are relatively consistent with other data in our survey. Looked

at from the receiving or host side, about 11.2 percent (n=674) of our respondents reported that they temporarily sheltered relatives or friends in their own homes sometime in the year after the earthquake (for some reason, 75 respondents did not reply to the survey question on this topic). Single people were slightly more likely to have been sheltered or hosted by others than were married, divorced or widowed persons. However, as opposed to what movers to other houses had reported, the hosts of those who moved said nearly half (48 percent) came to them because they could not live in a damaged or destroyed home, and another 21.4 percent because the building moved to was safer. But those who received people in their own homes said two thirds (67.6 percent) stayed up to a month. This is only a slightly different figure (60.6 percent) than reported by movers, as indicated earlier.

A very striking finding about both those who moved in with others and those who hosted them is that persons in neither category have very negative attitudes about this disaster problem. For instance, those who temporarily moved---that is primarily went to relatives---were often less negative than persons who had not gone elsewhere sometime in the year after the earthquake. This is true whether actions, views of organizations or activities are involved.

For example, movers judged the immediate governmental response to the earthquake as not effective less often than did nonmovers (18.7 percent to 19.8 percent); a year later, only 14.1 percent of movers rated the ensuing actions of the government as ineffective whereas 20.1 of the nonmovers did so. Movers did not want more information about the earthquake situation than did nonmovers (41.9 percent to 53.6 percent wanted more). Movers, compared to nonmovers, did not evaluate the Mayor's Office, the military or the police as less organized (the respective figures are 13.2 percent to 17 percent; 7.6 percent to 16.3 percent, and 13 percent to 24.2 percent), and they did not have a more negative image of the President of Mexico or of IMSS (the Social Security Agency). In fact, movers had fewer negative views than nonmovers regarding how poorly the government had informed citizens about the disaster (31.3 percent to 37.7 percent), how poorly it handled housing support (16.7 percent to 26.4 percent), how poorly it moved offices (20.9 percent to 24.6 percent), how poorly it handled demolition and debris clearance (15.5 percent to 16.8 percent), how poorly it dealt with sheltering victims (12 percent to 21.8 percent), and how poorly it dealt with housing inspection (29.8 percent to 29.9 percent).

While many of the percentage differences are small, the pattern is consistent--movers clearly are not as negative as nonmovers regarding a great number of governmental actions. Those that moved were even less negative in their judgment that the new housing distribution had been unjust (34.7 percent of movers compared to 40.9 percent of nonmovers).

In addition, those who went to live with others do not stand out as a particularly disgruntled category of persons. Even though they moved in the aftermath of the earthquake, and reported they had more problems with electric, water, phone and mail services than nonmovers, they were not especially prone to blame anyone or to have strongly unfavorable views of anything done. Only on a very few points were negative views expressed. For example, movers, compared to nonmovers, did think the Mexican government handled foreign aid poorly (62.4 percent to 49.1 percent), and they also believed that the housing problem should have the highest priority for attention (75.5 percent to 67.8 percent). And movers did have decreased confidence in the government compared to nonmovers (67.8 percent to 56.7 percent among those who had less confidence). But these were about the only exceptions and stood out because they were so different from the general pattern.

Movers were more likely to participate in disaster related activities than nonmovers (77.7 percent to 53.5 percent), although it appears that most of the difference may be that movers, more than nonmovers, engaged in immediate search and rescue. But those who moved gave only slightly greater attention to planning for future disasters and had very little increased knowledge of general disaster planning or the national system of civil protection. Movers and nonmovers were almost identical in their knowledge of emergency phone numbers (52.4 percent to 52.5 percent). Nonmovers were actually more likely to have a first aid kit than movers (49.5 percent to 42.1 percent). Put another way, movers did not especially seem to have learned much from their disaster experience.

The attitudes and behavior patterns of those who hosted people in their homes were similar to those who relocated. Along a few lines, those who sheltered relatives were somewhat more negative compared to those who did not take anyone into their homes. For example, those who hosted others were more critical of the immediate governmental response to the earthquake (24.8 percent compared to 19.1 of those who sheltered no one). A year later, the same negative attitude continued (24.7 percent compared to 19.4 percent). They also thought the President was less organized, etc. However, 40.2 percent of those who sheltered others, compared to 50.7 percent of those who did not, thought the government had handled foreign aid poorly. Those who had hosted others were less likely to have thought of moving out of the city than those who took no one in their homes (68.2 percent to 76.7 percent). There was no difference between those who sheltered and those who did not regarding the fairness of how the new housing had been distributed. Similarly there were no differences on how the police or the military were viewed, or how organized or unorganized the President of Mexico had been in his response, or how well the Mayor's office had acted. Also, there were no significant differences in views on how the government handled housing inspections, sheltering, demolition and debris clearance, housing

support or providing information. Those who sheltered were a little less likely to think that the earthquake had increased trust in people than those who had not sheltered someone (16.7 percent to 20.5 percent).

Again, while many of the percentage differences are very minor, the overall picture is consistent. Those who sheltered or hosted others were not particularly negative. While this is understandable about aspects of their own behavior, it is less obvious why someone or some groups were not blamed or at least given negative evaluations for what happened with respect to the problem of sheltering and housing after the earthquake.

Consistent with what we have repeatedly found elsewhere in our analysis, there were some social class differences. For example, 15.8 percent of our MC respondents compared to the LC (21.2 percent) and UC (28.3 percent) respondents thought that the government did not have the housing situation under control immediately after the earthquake. One year later, even more MC respondents (19.4 percent) thought the government did not have full control of the situation. But UC judgments that the government still did not have control over the housing problem had fallen to 3.6 percent, and among LC respondents, it had dropped to 16.4 percent. This indicates that the MC went from being the least critical of the government response to being the most critical.

However, and what is more important, both right after the earthquake and a year later, a clear majority of our respondents did believe the government had control over the housing problem. These figures do raise questions about the political and ideological statements after the disaster that the earthquake had radicalized the lower strata of Mexican society; a position supposedly illustrated by some of the unruly demonstrations that took place in the post impact period in some of the neighborhoods of the capital city.

d. Other participation in post-disaster activities.

A majority of our respondents (55.9 percent) said they undertook some longer run post impact earthquake related tasks. The range of activities was even broader than those carried out in the immediate post impact period (the two weeks after the disaster). On the whole, such persons did not differ substantially in their attitudes from those expressed by nonparticipants, although on particular items there were some minor differences.

For example, participants wanted more information about the disaster (56.7 percent to 47 percent), and they were somewhat apt to judge the government response in the short run (22.1 percent to 16.7 percent) and in the long run (21 percent to 17.5 percent) as less efficient, than did nonparticipant. They also had diminished confidence in the government as a result of the earthquake; at

least among those who changed in their attitudes, participants had lost more confidence than nonparticipants, 66.3 percent to 48 percent. This percentage difference is one of the sharpest in the whole survey. (However, to keep this in context, overall a majority--52 percent--said the earthquake made no difference in the confidence they had in the government with 20 percent saying it had increased and 26 percent decreased).

On the other hand, participants did not see the housing problem as needing more attention than did nonparticipants (68.3 percent to 68.9 percent). They did not judge the Mayor's Office as less organized to cope with a new disaster (16.5 percent to 16.7 percent). They had almost an equally positive view of the government handling of sheltering earthquake victims (46.8 percent to 43 percent), and an equally negative view of the government handling of the NAFINSA fund (47.8 percent to 48.7 percent). (NAFINSA was a fund consisting of donations for earthquake victims). Participants had just about the same increase in trust in other people as did nonparticipant (80.3 percent to 78.6 percent). Those who participated in post-disaster activities actually were very slightly more favorable about military and police actions than nonparticipant.

Overall, the picture is clear: those who participated or volunteered in longer run post impact earthquake related activities and those who did not were substantially the same in their attitudes about a variety of matters and groups. But it is not apparent why we found no significant differences. It could be speculated that this is because the participants numbered about half of the population with the sheer numbers involved cancelling out differences. More probable our survey questions did not tap aspects about which there were differences. Whatever the reason, there was far less difference between those who volunteered in the long run with respect to earthquake related matters and those, who as we indicated earlier, had volunteered in the short run.

e. Some positive views.

Not only was there a general absence of negative views about many aspects of the disaster, but some rather positive views of the social consequences of the earthquake also surfaced. For example, consistent with what some researchers have previously found (e.g., Quarantelli, 1985a), the persons in our survey reported that family ties were strengthened as a result of the experience of the disaster. About 30.7 percent of our respondents said they had better relations within the family after the earthquake than they had before the earthquake; only 1.4 percent reported a worsening of family ties--the rest said they had not changed. Just about three out of every five respondents (60.5 percent) also thought that the experience of the earthquake had increased the trust people had in other citizens.

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There was a social class difference among those who thought trust had increased. It was strongest among LC respondents (82.4 percent) than among our MC (77.4 percent) and UC (74.4 percent) individuals. Overall another 40 percent said it made no difference; only 12.3 percent thought that the earthquake experience resulted in diminished trust. Interestingly, single more than married persons (65.9 percent to 56.2 percent) had developed greater trust. There was no significant gender difference on this perception.

<div align="center">

Attitudes About the Handling of
Earthquake Related Problems

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a. Views about general and specific governmental activities.

It is of interest that a majority of our respondents believed the government grew more effective during the year after the disaster. While 31.9 percent viewed the governmental response as very effective in the immediate days after the earthquake, the figure rose to 44.1 percent for the year. In contrast, there was little change among those who saw little effectiveness (19.5 percent for the immediate post impact period and 19.5 percent for the year period).

Although there was not much consensus on what was handled especially well in the immediate post impact period with very many activities being mentioned, the rescue of survivors and the handling of traffic and security were the two tasks most mentioned. Insofar as the year long period is concerned, again there was little consensus or a singling out of specific activities. But handling the housing needs and problems of earthquake victims was mentioned most of all. (Although when specifically asked about how just--and not simply the handling of--the distribution of new housing had been, 40.3 percent said it was not just, 29.8 percent just, 16 percent mixed, and 13 percent did not know).

Our respondents were also specifically asked about 15 different earthquake-related tasks that the government had undertaken in the year after the disaster. With regard to only one activity--the handling of foreign aid--was there a majority who thought the activity was poorly (31.1 percent) or very poorly (20 percent) handled. (This is consistent with findings reported by Comfort, 1986 who found that while there were positive views about the offering of international aid, most respondents had little information on how to get it and even fewer actually received anything). Nearly a majority (48.1 percent) had the same unfavorable view about governmental honesty in the administration of the NAFINSA account, that is the money set aside for disaster victims. Somewhat over a third (37.1 percent) thought that citizens had been poorly informed on how the recovery was progressing. Women were slightly more negative than men in their evaluations on these matters.

There were also some differences between social class strata ranking and negative attitudes on the three problems indicated, but they were not significant. UC respondents were only slightly more likely to be negative than MC or LC persons about the handling of foreign aid; there was a somewhat stronger inverse association between higher social class ranking and how poorly the government was judged to have handled information distribution about the earthquake. On the other hand, the handling of the NAFINSA account was slightly more negatively viewed by LC individuals (49.7 percent) than by MC (47 percent) and UC (45.1 percent) persons.

However, on the other dozen activities, negative evaluations (that is, agreement with statements that the activity was poorly or very poorly handled) averaged only 9.1 percent. Looked at from the other side, we can see that a number of governmental tasks were especially positively assessed. For example, 60 percent thought that the restoration of schools and hospitals was well or very well handled; 56.6 percent said the same for telephone restoration; 54 percent for restoration of water services; 49.2 percent also ranked highly the demolition of buildings and the clearance of debris; 48.7 percent said the same about the passage of laws to increase the earthquake resistance of buildings; and, 45 percent praised the handling of the providing of shelters for the homeless.

The overall pattern is clear and consistent. Residents of Mexico City varied somewhat in their evaluation of governmental activities, but they were in general considerably more positive than negative. It is also noticeable that, for the most part, the more visible and concrete actions were given positive evaluations. Furthermore, in line with what has been noted a number of times now, our respondents, whether in volunteered replies or when asked directly, generally avoided very negative or very unfavorable assessments. It is not that they did not notice or mention problems, difficulties, inefficiencies, delays, etc.; rather there seemed to be an unwillingness to assign blame or hold particular organizations specifically responsible. In our later analysis we shall consider to what extent this orientation might reflect Mexican cultural values and/or reactions to what the government and other organizations had actually done.

Contrary to what some others have written, we obtained very little evidence that the government was the object of much disdain and rage (e.g., Gavalya, 1987). Now it is true, for example, on the earthquake anniversary a year later, that a group called the Council of Earthquake Homeless Families, estimated at 10,000 people undertook a protest march (Kultenbrouwer, 1986: 4). But numerically these were the very small exceptions among the population. In fact, the very same day there was another street rally of around 50,000 PRI supporters who expressed their solidarity with the homeless and approval of the government's reconstruction program (Mullen, 1986: 4).

Thus, while undoubtedly there were complaints about the recovery effort, and while probably some vocal elements that complained received attention from the press and others, there is no indication in our survey findings that such feelings were at all extensive in the community. However, from a symbolic point of view the demonstrations against the government may have sent a "message" to the public authorities, indicating that at least some groups were using the earthquake to express their general dissatisfaction with the regime). As we shall indicated later, concern over possible political unrest as a result of the disaster may have contributed to the establishment of disaster planning in the year after the earthquake.

b. Attitudes about particular organizations.

Respondents were asked their views about a dozen organizations, especially how organized and how humane they were in their disaster-related actions, and whether or not the groups were better prepared a year later to cope with a new natural disaster.

Only an average of 5.7 percent of our respondents evaluated the groups as a whole as disorganized or very disorganized. A great part of that percentage is traceable to the unfavorable views held of only two of the organizations, namely the police and the military. Some groups, such as the Mexican Red Cross and the Mexican City fire department, were negatively viewed by extremely few people (conversely 86.9 percent thought of the fire department as being very organized and 83.7 percent thought the same of the Red Cross).

Negative evaluations of the humanitarian dimension follow the same pattern. Only an average of 4.6 percent of all our respondents saw the groups as nonhumanitarian or very noncompassionate, with the majority of this percentage attributable to a very negative perception of the same two groups that are consistently unfavorably evaluated, that is, the police and the military. Conversely, for example, the President of Mexico is seen as compassionate or very humanitarian by 62.1 percent of our respondents; the corresponding figure for the IMSS, the Social Security Institute, is 81. 3 percent. These findings do support the statements of some observers that relief agencies were generally viewed with gratitude (e.g., Gavalya, 1987).

Also, all organizations which were asked about in the surveys, were seen as better able to handle a disaster a year after the earthquake than before the disaster. Even the military (better=38.3 percent and less=15.5 percent) and the police (better=32 percent and less=23.1 percent) were thought on balance to have improved. Eight of the groups were evaluated by more than 50 percent of our respondents as having become better prepared during the year after the disaster. The generally rather positive

view of the mass media expressed in the 1985 survey is even more strongly asserted in the 1986 survey. In fact, 56.2 percent expect a future disaster will be even better covered by the mass media organizations; only 8.1 percent expect a worst performance.

These evaluations did not seem to be affected by whether the respondents had been volunteers or not. As seen in Table 6 which follows, there were no significant differences in the direction of the evaluations of those in either category. Different assessments were made about the probable performance of various groups, but overall all organizations were seen as likely to do better or at least as well in a future disaster.

Table 6. Evaluation of Volunteers and Nonvolunteers on Whether Specific Organizations Would Perform Better, the Same, or Worse in a Future Disaster.

	Better	The Same	Worse
Organization:			
DDF by volunteers	38.0	45.5	16.5
by nonvolunteers	43.8	39.5	16.7
Military by volunteers	38.1	46.9	14.9
by nonvolunteers	38.4	45.5	16.1
Police by volunteers	29.4	48.3	22.3
by nonvolunteers	35.2	40.6	24.1
Telephone company by			
volunteers	56.1	33.7	10.2
nonvolunteers	49.4	38.6	11.9
Red Cross by volunteers	68.0	30.2	1.8
by nonvolunteers	59.1	37.7	3.1
Fire department by			
volunteers	69.0	29.8	1.2
nonvolunteers	60.2	36.2	3.5
IMSS by volunteers	57.0	36.0	7.0
by nonvolunteers	48.3	44.2	7.4
Health service by			
volunteers	54.4	40.6	5.0
nonvolunteers	47.8	46.0	6.3

What organizations actually did undertake in the year after the earthquake and whether they actually became better prepared was not something we systematically looked at in our study (although

we report our impressions elsewhere in this volume). But we can say that our findings clearly indicate that the Mexican population in the year after the earthquake developed more favorable views of these groups and believe they would be better able to cope with a new disaster. That is the social reality we found.

Given our earlier discussion of the position and role of the President of Mexico in the country, the survey findings of how he was perceived by citizens in the second survey are interesting.

Table 7: Perceptions of the President of Mexico
A Year Later

a. How well organized was he in his response?:   %
        Very organized   18.9
        Organized   36.0
        Partly organized and disorganized   6.6
        Neither organized or disorganized   23.1
        Disorganized   9.0
        Very disorganized   6.4

b. How compassionate was he in his response?:
        Very compassionate   23.6
        Compassionate   38.5
        Partly compassionate and partly not   6.1
        Neither compassionate or not   18.4
        Not compassionate   7.4
        Very non compassionate   5.9

c. How organized was he compared to a year earlier?:
        Better organized now   43.1
        Same as before   42.6
        Less organized now   14.3

Clearly, the President of Mexico continued to be positively viewed by a majority of the survey respondents. Only a small minority, about 15 percent, thought he had been disorganized or noncompassionate in his response to the earthquake or had become more disorganized in this response during the year. Of course in absolute numbers this translates into millions of citizens who viewed the President negatively. But overall the disaster had little effect on how he was viewed by the residents of Mexico City.

Social class differences on perceptions continued to reflect the predisaster situation. In general, LC respondents saw the President as more organized and more humanitarian than did MC and UP respondents. It is in the MC strata that one finds the most of the relative few who perceived him as less organized a year later than at the time of the earthquake.

In terms of our discussion in an earlier chapter of this volume, there did not seem to have been any public erosion of the position and role of the President as a result of the disaster. At least in percentage terms, he continued to have rather high ratings from a majority of the population. Numerically of course there were many dissatisfied citizens although they seemed to have maintained such attitudes and evaluations from the predisaster setting rather than having acquired them as a result of the earthquake.

Learning From the Earthquake

a. Sensitivity to future disasters.

Given its geographic location, Mexico City is subject to frequent minor tremors from both near and distant earthquakes. It is therefore of interest that about two fifths of our respondents (40.2 percent) reported that in the year after a major earthquake, they felt more tremors than they had before the disaster. This is consistent with other studies which indicate that persons who directly experience disasters become more sensitive to cues of dangers than they had been before the occasion (Drabek,1986: 323-327). However, somewhat puzzling is that about a fourth of those responding in our survey (25.3 percent) said that they felt less tremors during the year than they had before. (We of course do not know if there actually had been more or less tremors that could have been noticed by human beings in the year period after the earthquake--in fact since any such data would have to be location specific, in any genuine sense it is not obtainable information).

Whatever the sensitivity to cues of danger, there is little question that those who had resided in Mexico City at the time of the earthquake felt _less_ safe a year later than they had before the disaster. For example, nearly half (46.1 percent) expressed concern about the safety of relatives and friends from future damaging earthquakes. However, at the behavioral level the concern was less pronounced. Thus, only about a fourth (24.9 percent) were more afraid to go to the movies and/or theaters after the earthquake than before. Although here again a sizable minority, 19.6 percent, were _less_ afraid than before the disaster. Nearly half (44.3 percent) did say they were more nervous in tall buildings a year later, but the meaning of this is not clear since we have no data on how much our respondents actually went into high rise buildings before and/or after the earthquake. Actually, one study which estimated that 70,000 structures had been damaged said that only 1,400 of them were over four stories. In general, the psychological concerns expressed seemed to be somewhat less than others found up to five weeks after the earthquake (e.g., Dufka, 1988).

Among our survey respondents, about a quarter (26.3 percent) said the thought of moving out of the city had occurred to them,

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although there is very little indication that such a move was taken as a serious possibility. In fact, when asked why they had not moved, they gave such reasons as having to work in the metropolitan area. Only 1.1 percent of those who even said they considered moving, ever did move elsewhere. These figures are somewhat consistent with what other postdisaster surveys have obtained with reference to moving from a location after a disaster. About 5.1 percent of our survey respondents had moved within the area during the year, but that is probably within the normal range of moving in the community.

b. Knowledge of governmental disaster planning.

Little seems to have been learned by our respondents about organizational preparations for disasters. As indicated earlier the Mexican government had in the year following the earthquake set up a new federal level disaster agency--a national system or agency for civil protection. However, only 7.2 percent of our survey respondents even claimed that they knew of the federal organization. But this is probably on the high side, for when probed about their knowledge of the system, very few persons could give any details. In fact, 40.8 percent of those who said they had heard of the civil protection system admitted they knew nothing about it. Almost everyone else who volunteered some details were incorrect in their statements.

Actually it is fairly clear that even among the relatively few (14.1 percent) who claimed some knowledge of formal disaster planning--apart from knowing of the civil protection agency or system--knew very little. Thus, there was a tendency to equate awareness of school drills, the military plan, and a variety of other particular agencies (e.g., the police) and/or programs (e.g., reconstruction costs), with knowledge of disaster preparedness planning. Men who claimed to be twice as aware as women, did not exhibit any better comprehension of details.

Interestingly, only about two thirds--66.1 percent--thought the government should have the responsibility for disaster planning and rehearsals. Overall, there was a great willingness to participate in evacuation drills with 90.6 percent saying they would take part. Those who either sheltered or took shelter with others after the earthquake were slightly more inclined to do so.

c. Individual involvement in planning for future disasters.

In terms of self knowledge and actions, the overall picture is less clear and in some respects puzzling. When respondents were asked very specific questions about their own earthquake preparedness planning, a surprising number of persons said they had taken relevant actions or were specifically prepared. On the other hand, when respondents had to volunteer what they had done along these lines, claims for having done something dropped substantially.

For example, when asked directly, a majority reported they had undertaken some particular emergency-related actions or were specifically prepared in some way. Thus, more than three fifths (63.3 percent) said their families had agreed upon a safe place within their home. Over half (52.5 percent) indicated they knew emergency numbers to call if needed, although it can be assumed that some persons would know them independent of any disaster situation. Nearly half (48.7 percent) stated that they had a first aid kit in their homes--although the survey question did not specify whether or not the kits had been obtained during the previous year and/or as a result of the earthquake. Nearly half of our respondents also said they had developed (when applicable) disaster planning for children and/or elderly in their own households. About a third (36.1 percent) indicated they knew the safest way to leave their house in case of an earthquake. A little more than one of every four (26.1 percent) said that household members had agreed upon a place to meet after a disaster in which members were not at home and physically separate from one another. These kinds of figures are considerably higher than what others have reported about learning from the experience of a disaster (Drabek, 1986: 323-327).

On this matter also there were some consistent social class differences in the claims advanced of having prepared for future earthquakes. As also has been reported elsewhere (Drabek, 1986: 24) there was a direct relationship between higher socioeconomic status and assertions of having undertaken disaster planning. For example, 53.6 persons of UC respondents compared to 35.4 percent of MC and 27 percent of LC persons--among those who said they had done anything--had planned for a future earthquake. The respective figures for having a first aid kit were 70.9 percent UC, 51.7 percent MC, and 42.1 percent LC, and for knowing emergency numbers, 61.5 percent for UC, 57.1 percent for MC and 47.1 percent for LC respondents. Not surprisingly too, on most matters the married claimed they had undertaken more preparations (38 percent to 29.8 percent).

In contrast, answers to open ended questions suggest specific learning may have been substantially less than the figures above might indicate. Only about a third of our respondents (33 percent) said they had given some thought or had done some planning in the event of a future earthquake. But among those (n=247) who made such a claim, the specifics were usually very vague. For example, under planning, respondents mentioned such actions as attempting to remain calm, leaving the house, looking for a safe place inside one's residence, helping others, leaving quickly, and similar kinds of activities. Very few mentioned the specific actions discussed above, such as an agreement on the safest place in the house, special attention for dealing with children and/or elderly, or an understanding where family members might meet after a disaster. In fact, 34.4 percent admitted that they just as soon preferred

not to make any planning, another 12.8 percent noted that planning had not crossed their mind, and another 7.2 percent said preparations were pointless. There is little evidence in these data to suggest that many households had given much concentrated attention or had specifically discussed how family members should act in the case of another earthquake.

With this we conclude the data presentation. We now turn to our more general analyses and presentation of some implications of what was found at both the organizational and individual levels.

PART IV. CONCLUSIONS

In this section we discuss three topics.

First, we discuss ten general research themes of our findings, five having to do with organizational and five with individual behavior.

Second, we compare the behavioral similarities and differences observed in Mexico CIty with what research findings have reported elsewhere, but especially in the United States. In the more detailed examination of six major response differences we discuss what factors might be involved by taking into account the relevant literature.

Third, we conclude with some methodological and conceptual implications from our work for future research. Especially addressed are such issues as the significance of small numbers, an agent specific versus a generic approach, whether a disaster or catastrophe is being studied, the usefulness of studies in metropolitan areas in the future, and the advantages and disadvantages of cross-societal studies.

Chapter 9

GENERAL THEMES AND IMPLICATIONS

In the previous chapters, we presented a number of specific observations about individual and organizational behaviors in the Mexican earthquake and its aftermath. In this chapter we set forth ten general conclusions or themes that cut across a number of our particular empirical findings. Organizational behavior is first highlighted, then the behavior of individuals is discussed. In the process some implications are noted.

Organizational Behavior

We will discuss that:
- (1) the organizational response was decentralized;
- (2) organizational resources were not problematical;
- (3) the dominant organizational behavior was emergent;
- (4) organizational personnel carried out their occupational roles; and,
- (5) there was organizational change as a result of the disaster.

1. The initial organized emergency response was massive, complex and decentralized; although limited overall coordination only slowly developed, the decentralized groups functioned relatively effectively.

Researchers have long noted that much of the disaster planning literature as well as actual planning uses a "command and control" model. This assumes that organizational responses in disasters need to be centralized with decision making at the top in formally authoritative positions (see Dynes, 1990). On the other hand, researchers have also long noted that the actual management of the emergency time period in disasters very rarely follow such a model. Instead organized responses in disasters tend to involve coordination much more than control since decision making is pluralistic and decentralized at lower levels of organizations (Dynes and Quarantelli, 1977: 24). It is believed that:

> the structural conditions of the emergency period makes for uncertainty, diversity, decreased formalization and decentralization (Dynes and Aguirre, 1979: 73).

Clearly in Mexico what we found was the second model. Through the first three days of the emergency period, the organizational

response was dominated by a substantial amount of independent actions. With the withdrawal of the military from a lead role, it required about three days for the DDF to assume legitimacy and create some coordination of the activities and for the CME to become operational. During this initial period, hundreds of public and private groups handled relatively well many problems in the areas of search and rescue, sheltering, casualty care, and the restoration of services. However, there was no overall coordination of this massive response, contrary to some outside organization views that "the Government's response was rapid and co-ordinated" (United Nations Economic Commission, 1985: 6).

For the remainder of the two weeks following the earthquake, this pattern was modified in degree, but not in kind. Thus, the DDF assumed a more coordinative role, and the nightly meetings of the CME were critical in the organizational taking on of tasks and the sharing of information at the highest levels of the metropolitan structure. However, a "command and control" structure was never imposed, there was not a top down centralized system of decision making and operations. Illustrative of this is that no central EOC staffed around the clock was ever set up. The DDF served more as a "broker", that is, as a small, social entity that identified problem areas, provided information, located resources, and facilitated contacts between different groups. What came into being was what earlier researchers have called an "emergent resource" model of operation (Dynes, 1983). An inherently decentralized response pattern remained, although there were pockets of segmental coordination occurring among some organizations working at the same tasks.

While the general research literature assumes that a decentralized response is typical in disasters, there are some writings that suggest a possible qualification for what might happen in highly centralized societies, especially in developing countries. For example, McLuckie (1975: 8) hypothesizes that in more centralized societies, emergency management will be dominated by a few positions that are high in political organizations in the system. Anderson (1969b) suggests that there is a tendency for military organizations to assume a larger role in disaster response in centralized and developing countries. Others, such as Clifford (1956), have also observed an increase in centralization in organized response activities in disasters outside of the United States; in fact, he was reporting on a flood along the Rio Grande River and an hurricane disaster in Tampico, Mexico. But he also did report that there was a tendency for Mexican disaster victims to rely more heavily upon family and relatives and to be less responsive to officials than victims in the United States. Kennedy (1982) also, after looking at the organizational activity and the military describes a rather centralized and from the top down operation in a 1965 earthquake in Chile.

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Why then did a decentralized response occur in the Mexico City earthquake? A number of factors are relevant. First, the demands created by the earthquake were extensive. There was major damage to the infrastructures and resources of many governmental agencies. This was unlike many disasters where the key organizations are directly untouched and remain available to be mobilized and used in whatever way is necessary. Furthermore, while the earthquake effects were diffuse throughout the metropolitan area, the physical damage and destruction was concentrated in certain neighborhoods, blocks and streets, all of which fostered immediate action on the part of local, independently operating groups.

Second, the nature of the disaster precluded the implementation of the military plan, DN-3 which formally provided for centralized control. Therefore, the response of almost all organizations was not guided by any overall planning and exercising or by a similar earlier experience. Authority and coordinative action, like most other aspects of the response, had to be improvised. At the system wide level, even a semblance of coordination took time; in this case, approximately three days. While intraorganizational coordination among autonomously responding groups was easier to achieve, this did not occur in all groups.

Third, and most important of all, the pattern of relationships that emerged after the earthquake was consistent with everyday patterns within the DDF and Mexico City. During routine times, public organizations and agencies within the city operate informally with considerable autonomy; there is at the operational level, a decentralized system. It is of interest to note that when coordination of action did occur among agencies, such as that among federal, state and district agencies working to repair the water system and supply emergency water, it was often among those who had similar contacts during normal times. We will return to this general point later, noting our initial incorrect assumption as researchers that Mexico City was highly centralized and our later discovery that while there may have been some official or formal centralization, at the operational level there is considerable decentralization on an everyday basis.

A practical implication of our general finding is that when officials are faced with a massive disaster that seriously disrupts lifelines, directly impacts responding groups, and is diffuse in its impact, a considerable period of decentralized organizational action should be anticipated. The most useful type of planning therefore would be attempts to develop a degree of self-sufficiency among potentially responding units and formulating measures to facilitate coordinating this initial response through time. What some disaster planning agencies such as BAREPP in the area around San Francisco and SCEPP in Los Angeles are attempting to develop for managing major earthquakes in California would seem to be on the right track.

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There are several implications from a theoretical point of view. For one, the decentralized response in the earthquake is supportive of the principle of continuity frequently discussed in the disaster literature (e.g. Quarantelli and Dynes, 1977). This is the idea that what is in place before a disaster will continue during a disaster. However, what our study in Mexico suggests is that it is necessary at times to go beyond the surface. Superficially looked at, the everyday formal governmental structure in Mexico City might appear to be a top down, centralized system; looked at more closely especially from an operational point of view, even the normal system was rather decentralized. Other observers of the Mexican earthquake have also initially missed this point (e.g., the statement is made in Update, 1985: p.1 that "the Mexico City's government is highly centralized").

Another theoretical implication, at least for study purposes, is that there may be in certain disasters a relationship between the degree of centralization of a system and the degree of centralization of the organized response. Our observations in the earthquake do not deny that there could be centralized responses in disasters in centralized systems; Mexico City did not have a centralized system. We need to go now beyond asserting that organized disaster responses are either centralized or not centralized to specifying especially the social structural conditions which are conducive to one or the other response pattern appearing. While we think a case can be made that most emergency time organized responses in disasters will necessarily tend to be relatively decentralized, it is not improbable, given the principle of continuity, that in centralized systems there will be some carryover from everyday patterns (and there is some implications of this in McLuckie's study of national level responses to disasters in Italy, Japan and the United States; see, 1977).

Finally, what this study also implies is that we need to obtain a better picture than we have of "loosely coupled organizational systems", the label as we indicated earlier Weick (1976) applies to such social organizational arrangements as we found in Mexico City. There would seem to be, at least logically, the possibility of different kinds of loosely coupled systems---there might be autonomy along a variety of different social dimensions. If so, then the consequences for disaster planning and disaster response might differ.

2. Organizational resources needed to cope with the disaster were not problematical, but there were difficulties in their quick and integrated use.

A disaster frequently conjures up images of massive damage and destruction of people and things. In fact, there is a frequent tendency to define disasters in terms of casualties and/or physical damages (Britton, 1987 points out this is especially so by nonsociologists; for a very recent example see Keller, Wilson and

Kara-Zaitri, 1990) although more sophisticated conceptualizations tend to stress social vulnerabilities, social disruption and disaster occasioned needs/capabilities imbalances (see Pelanda, 1982; Quarantelli, 1985d, 1987b; Drabek, 1987b; Kreps, 1989: 32). However, damage to people and things sometimes do occur on a large scale and often to some degree in most, although not all disasters. Therefore, one presumed consequence of such a happening would be a presumed lack of resources to cope with post disaster needs and demands.

As we have indicated, it is clear that in Mexico City, except in very isolated instances, there was not an absence of organizational resources in the aftermath of the earthquake. That is, for most purposes or activities of organizations, they had the personnel, material, equipment, goods, etc. that they needed. There were a few exceptions, for example, heavy duty equipment for the later search and rescue effort attempts in collapsed high rise buildings (Olson and Olson, 1987; Martin, 1989). But our study found little evidence that organizations generally suffered from lack of needed resources.

There are several explanations of this. When all the casualties and physical damages are added together, they constitute a minor fraction of all the people and things in Mexico City at the time of the earthquake. This can be seen even when losses in specialized matters are considered; for example, a number of physicians and nurses as well as hospital facilities were lost, but the huge size of the everyday health system which survived allowed it to cope adequately with disaster generated medical needs.

In addition, there was, as there always is in such occasions, a massive convergence of people and things to the disaster site. From within the areas of the capital city undamaged by the earthquake, from other areas in Mexico, and from outside the country there came a flood of aid in every conceivable form that more than compensated for whatever losses in resources were suffered.

Now there were serious problems with respect to the use of personnel and goods in coping with the disaster. But the difficulties were not in the absence of, but rather in the quick and integrated use of, the available resources. (we leave aside here the separate problem of unsuitable aid, such as some of the medical supplies that arrived). As we documented earlier, there were often delays and slowness in getting and using resources where they were needed, both within and between organizations. Also, as we have repeatedly illustrated, there was considerable lack of integration in using resources (ranging all the way from volunteer personnel searching over and over again particular sites while other locations received no systematic attention, to the relative absence of vehicles for taking dead bodes to the morgue when hundreds of ambulances went unused for that purpose).

These observations are consistent with the research literature (Drabek, 1986). In most disasters there is no quantitative lack of resources, be these people or things. But there often is slowness in getting such resources to where they are most needed. In part, this is because there is almost always serious difficulties in initial assessments of what resources are needed and where, a factor that is compounded the more the disaster impact is spatially diffuse, as to some extent was true of the earthquake in Mexico City.

Also, there typically is mass convergence of helpers and help, often by people and groups unfamiliar to one another working in an unfamiliar and confused setting. Furthermore, when organizations are involved in responding to a disaster, both their intra and interorganizational communication becomes problematical, especially in the absence of prior planning (Quarantelli, 1985c). Then, too, many groups will improvise in a variety of ways. Finally, widespread decentralized decision making often occurs in organizations coping with disaster demands. All of these conditions occurred in the response to the earthquake; all hindered and retarded an overall or integrated use of available resources.

From a practical viewpoint, Mexico City again illustrates that certain response happenings are to be expected. Using available resources will be more of a problem than having to find new ones. Convergence, while helpful along some lines, often creates a resource overloaded situation. Quick decentralized decision making at lower levels of organizations, again very functional for effective on-the-scene responses, makes an integrated use of resources difficult. These are all issues which can be addressed and ameliorated by planning the management of a disaster which is different from preparing for a disaster; planning is not managing and different principles are involved as disaster researchers have pointed out (Quarantelli, 1985c).

At a more theoretical level, Mexico City illustrates again that there tends to be certain almost universal features of organizational activities and problems that are inherent in the very social nature of disasters. If so, there is some sort of balance necessary between prior planning and dependency on improvisation in a disaster response. This is a point recently strongly made by Kreps:

> Our general argument is that effective emergency management requires both improvisation and preparedness. Absent the former, emergency management loses flexibility in the face of changing conditions. Absent the latter, emergency management loses clarity in meeting essential disaster related demands. Equally important, improvisation and

preparedness go hand in hand. One need never worry that preparedness will become so rigid as to decrease the ability to improvise. Quite the opposite, the very effort to prepare, even if is only modest, increases the ability to improvise (1990: 10).

At present researchers do not know the best balance, but the disaster in Mexico City suggests the question ought to be more seriously examined in theoretical studies than it has been up to the present time.

3. The emergency time organizational response was dominated by the activities of extending and emergent organizations and characterized by much emergent behavior.

A useful typology of organized response to disasters was developed in the early days of DRC (see Quarantelli, 1966; Dynes and Quarantelli, 1968; for derivable propositions from the typology see Stallings, 1978). According to this typology, there are four types of organizations that respond in disasters.

First, there are **established** organizations who engage in their regular tasks and utilize their normal structures. These are often emergency oriented groups such as police and fire departments (although even such organizations may show a different form depending on the response to a particular disaster; see Wenger, Quarantelli and Dynes, 1986). Second, **expanding** organizations are those groups that undertake traditional tasks, but undergo an alteration and expansion of their normal structures to do so. American Red Cross chapters and some social welfare agencies are examples of collectivities that often change in this direction in disasters. Third, **extending** organizations maintain their normal day-to-day internal structure, but perform nonregular or nontraditional tasks during a disaster. For example, a construction company may become involved in building demolition and debris clearance. Finally, **emergent** groups are organized collectivities that did not exist before the disaster. They are social entities that undertake new tasks and develop a new structure to guide their activities, e.g. an informal search and rescue team or an ad hoc coordinating committee.

In fact, a constant refrain in the disaster literature since it started to appear in the late 1950s is that disasters are characterized by "emergent" phenomena. As Drabek (1987a) has recently noted that label covers a variety of different social activities and different theoretical issues. Quarantelli (1984a), using DRC studies of organizations, for example, has drawn a distinction between emergent groups (where there is some new social collectivity) and emergent behavior (where there is no new social entity but only new social actions).

In the Mexico City earthquake, the leading roles were played by extending organizations and emergent groups, and to a somewhat lesser extent, expanding organizations. At the highest levels of authority within both the federal and district jurisdictions, new and emergent groups came into being to handle the problems of coordination of activity. At the level of operations, extending organizations appeared as the petroleum company, subway and transportation units, certain governmental departments, private businesses and lifeline agencies undertook nontraditional tasks for themselves such as undertaking search and rescue, caring for casualties, sheltering and feeding victims. Some major social institutions, such as the Red Cross became expanding organizations.

In addition, new informal groups of citizen volunteers and organizational representatives emerged to handle various disaster generated problems. Also particularly noticeable was the emergence of work brigades in many of the organizations. These, since they came out of the framework of traditional existing organizations, (most in fact bureaucracies) and were peopled by known co-workers, were not quite emergent groups, but more than emergent behavior. But in any case they were organized emergent phenomena.

Established organizations of course did not disappear. But it is interesting to note that organizations that maintained their usual structures and functions, such as the military and the police, played a limited role in the emergency time response. They undertook primarily traditional tasks for these groups, namely security and traffic control.

This extensive pattern of emergent behaviors, emergent groups and extending organizations was the result of a lack of prior disaster planning and the massive demands created by the earthquake which substantially exceeded the traditional, emergency response capabilities of the community. Suddenly a crisis situation existed due to an inadequate precrisis management structure and mechanisms. The inappropriateness of operationalizing DN-3 and giving overall responsibility to the Army (an established organization) created a void of established response mechanisms. Under these conditions, new emergent and extending activities developed to meet the pressing needs of the impacted community. Similar patterns have been observed in other disaster settings (Drabek, 1986: 154-157, 160-162).

It is of interest to note that some researchers have argued that the magnitude of a disaster can be gauged by the extent to which emergent and extending organizations become involved in the response pattern. Simply put, the more the response is dominated by these types of organizations, the more severe the disaster (Dynes, 1974; Quarantelli, 1987b: 25). If this proposition is correct, then it can be concluded that the earthquake in Mexico City was of great magnitude, not just in regard to its physical destruction, but with also with regard to its social disruption.

There are some important implications from the varied types of collective response that our study found. Among other things, the observed pattern suggests that prior planning must emphasize the need for groups at times of disasters to be able to improvise, to do things they normally do not do, and/or to do them in organized ways that are not usual for the organization. Traditional and established ways of doing things by usual social arrangements will not always work; the demands and needs especially in the emergency period of a major disaster often require something different of an emergent nature. In some cases what is required is even a new group doing new things, what we have called emergent groups.

From a more theoretical perspective, there are several implications about our general observation of emergence. In part, the Mexican earthquake shows that even in the absence of planning, the demands of extreme situations will force social alterations in the responses of relevant organizations. While this may be true, it does not follow that it has to be completely left up to spontaneous emergence. Good preparedness planning can anticipate much of what might be required and proceed accordingly. Not everything can be planned for, but many problems can be anticipated ahead of time which will allow a better organized response when the need arises. However, we need a more complete understanding than we now have of what should be given priority in preparedness, those aspects which can best be anticipated and those which perhaps might be more situationally contingent and less conducive to prior planning. Theoretical and empirical work on this matter is needed.

The observations in Mexico City, particularly of the work brigades, also emphasize a theme in prior research studies, that is, the need for a theory of emergent phenomena. The existing literature allows us to characterize the phenomena as emergent and see it as one type of group response (Stallings and Quarantelli, 1985). But a theory of emergence is needed for as Drabek has written:

> Even a cursory reading or empirical or theoretical statements pertaining to emergent structures highlights a wide variety of problems...only a modest degree of consensus exists regarding most of them...Three issues illustrate the more critical of these: 1) what is emergence? 2) what emerges? and 3) what bounds emergent structures?...Theoretical models must be constructed that address five issues: 1) origin, 2) structure, 3) stability, 4) termination, and 5) cross-system interaction (1987a: 260, 274).

4. Even in the absence of much group disaster planning, key organizational personnel did their jobs; there was no behavioral role conflict.

In the face of a sudden and unexpected highly stressful situation, as is typical of such disasters as earthquakes, it is conceivable that organizational personnel might not react too well in the immediate emergency time period (see Drabek, 1985). They could be in a state of psychological shock. They might abandon or not assume their work role in favor of other social roles, such as giving priority to helping their own family members. Or they might attempt inappropriate behavior given the needs of the new situation (such as adhering to traditional expectations of what they usually do, for example, a police officer giving a ticket for double parking in a debris clogged street). These are common beliefs and also suggested as probable reactions by some students of disasters. However, the bulk of disaster research indicates the opposite; namely, officials are not psychologically incapacitated, they give priority to their job responsibilities, and they innovate if usual occupational patterns are not meaningful in the emergency time period.

What did we find in Mexico City? Our study was not focused on organizational officials per se and interviews were conducted almost exclusively with occupants of high or relatively high level occupational roles. But in order to understand organizational behavior we had to find out what key officials themselves did. So indirectly we did obtain a picture of how top level officials personally reacted in the earthquake (we do not have an equivalent picture of middle and lower levels officials and staffs so our observation are not applicable to them).

We found that organizational officials, just as much as individual citizens, generally did not passively wait for orders or directions. In fact, it is possible to say that many of them were proactive rather than just reactive. They started to consider what effects the earthquake might have had on the operations of their organizations and what actions the group needed to undertake. Often, as we illustrated earlier, they moved to trying to assess damages and otherwise obtaining information relevant to their organization. Basically key officials were not psychologically frozen or stunned by what was essentially a very unexpected event.

Likewise, there were no role conflicts that behaviorally led officials to abandon or fail to assume their work responsibilities. Those on duty at the time of the earthquake, such as at the metro system remained at work, although as we illustrated in several quotations, they felt concern about family members or coworkers. The psychological concern about others did not lead them to leave their jobs. Those who were not at their jobs at the time of impact, as in the Red Cross, usually thought immediately they would be needed at their place of work, and proceeded to go there as best as they could. There was not much delay in getting to work locations. Thus, whatever role conflict existed, it was resolved in favor of their organizational role.

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response was dominated by a substantial amount of independent actions. With the withdrawal of the military from a lead role, it required about three days for the DDF to assume legitimacy and create some coordination of the activities and for the CME to become operational. During this initial period, hundreds of public and private groups handled relatively well many problems in the areas of search and rescue, sheltering, casualty care, and the restoration of services. However, there was no overall coordination of this massive response, contrary to some outside organization views that "the Government's response was rapid and co-ordinated" (United Nations Economic Commission, 1985: 6).

For the remainder of the two weeks following the earthquake, this pattern was modified in degree, but not in kind. Thus, the DDF assumed a more coordinative role, and the nightly meetings of the CME were critical in the organizational taking on of tasks and the sharing of information at the highest levels of the metropolitan structure. However, a "command and control" structure was never imposed, there was not a top down centralized system of decision making and operations. Illustrative of this is that no central EOC staffed around the clock was ever set up. The DDF served more as a "broker", that is, as a small, social entity that identified problem areas, provided information, located resources, and facilitated contacts between different groups. What came into being was what earlier researchers have called an "emergent resource" model of operation (Dynes, 1983). An inherently decentralized response pattern remained, although there were pockets of segmental coordination occurring among some organizations working at the same tasks.

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There was a considerable amount of behavioral trial and error and improvisation in what organizational officials attempted in the immediate periods after the two earthquakes. To be sure, there were at times efforts to obtain directives and guidance from traditional sources within organizations which would have been used on an everyday basis. But such attempts were not often successful. This often led then to initiation of considerable communication within and outside the organization in an attempt to obtain relevant information. In turn this led to decisions being made and actions being undertaken which were frequently rather untraditional for the officials and organizations involved. Put another way, while everyday bureaucratic norms and expectations were not totally put aside, deviations from the usual when necessary were undertaken to cope with the perceived turbulent changes in the social environment.

How key organizational officials reacted in the Mexican earthquake is generally consistent with most of the relevant research literature (Dynes, 1987; Mileti and Sorensen, 1987; Quarantelli, 1988). Role incumbents can be expected to do their jobs, although in many cases there will be as there was in Mexico City, some psychological role strain. Role conflict will be behaviorally resolved in favor of the organization (see Dynes and Quarantelli, 1986). Officials in bureaucracies at least temporarily will change their work role behavior in the direction of more adaptive courses of action. Even bureaucrats and bureaucracies, at least at the height of the emergency period, will modify their behaviors in attempts to cope with a crisis occasion.

From a practical viewpoint, the observations in Mexico City are reassuring. Even without disaster planning, it can be assumed that at least key organizational personnel will generally do their jobs and adapt to the crisis setting. Good disaster planning, however, could serve to reduce some of the psychological or role strain that frequently occurs to such role incumbents in disasters. Similarly, even bureaucratic officials will often attempt to innovate in the face of group needs. But again good planning could teach officials how to improvise. Such planning should follow the model not of a script or a blueprint (where particular courses of action are specified) but of a map which usually shows a variety of different ways to go different places.

At a theoretical level, our finding indicates a need to better clarify the relationship between role incumbents maintaining their old roles and innovating new ones. As one summary of research results mostly from DRC studies concluded:

> ...it has been found...that the less an organization has to change its predisaster functions and roles to perform in a disaster, the more effective is its disaster response.

> In essence, organizations whose daily
> operations can be switched to the topic of the
> emergency at hand do better than organizations
> who must adopt new operations:

but the authors go on also to note that:

> Organizations which are better able to vary
> from standard operating procedures during the
> disaster are typically more effective than
> those who cannot be flexible...An organization
> which is rigid in structure...has a difficult
> time dealing with the uncertainty of
> disaster...and adapting to its needs...to meet
> the challenge of performing new roles (Mileti
> and Sorensen, 1987: 20-21).

Just as we require a better understanding of the relationship
between preparedness and emergence, we also need to obtain a
clearer picture of the relationship between maintenance of
traditional work roles and innovating on those roles in an
emergency situation.

5. There were organizational changes in disaster preparedness
planning in the aftermath of the earthquake.

There have been relatively few studies of organizational change in
the aftermath of disasters (Stallings, 1987: 253). But to the
extent research exists, it shows that rarely has there been
"organizational learning" which has led to structural and/or
functional alterations with respect to preparedness planning. The
literature indicates that after a major disaster, organizational
officials frequently talk about the need to institute or change the
planning of their group. However, in the long run, few changes in
either structure and/or functions are permanently instituted. (see,
Adams, Stallings and Vargo, 1970). It is even rarer for a new
disaster oriented organization to be created. There are exceptions
to be sure (see Anderson, 1969a; Forrest, 1979), but on the whole
organizational change is not usually a consequence of a disaster.

In Mexico, in the aftermath of the earthquake the need for having
overall disaster planning and improving the specific preparedness
planning of particular organizations, was voiced. But contrary to
the typical post recovery situation, major changes were instituted.

> ...the Government undertook to enhance
> countrywide the static prevention of losses
> from earthquakes and hurricanes, as well as
> from other hazards by ordering a rapid updating
> of building codes in all 32 States in
> accordance with the latest results of
> engineering research in Mexico and aboard.

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> Within a month of the 1985 earthquake an
> Emergency Building Code was adopted for Mexico
> City. By late 1988 draft codes had been
> prepared for all other States under the
> coordination of a National Coordination
> Committee (Jakob, 1989: 3-4).

Concurrently, a National System of Civil Protection was projected and provided with a coherent institutional and legal framework. In fact, not only was a new organization planned, but actually established, as indicated in the following:

> a working group...was set up in 1986 with the
> specific objective of defining the
> institutional and operational conditions
> requiring the creation of...a national civil
> defense system. Early in 1989 the works done
> by this committee led to the present
> administration's decision to create within the
> Department of Interior...a Directorate
> specifically in charge of all matters of civil
> defense...The responsibilities which this new
> entity has been assigned, are--first--to
> prepare and/or help prepare appropriate and
> institutionally and technically coherent policy
> approaches to problems of hazard prevention and
> mitigation at the level of Federal, State and
> local governments, and--second--to oversee and
> where necessary, ensure interinstitutional
> coordination of all activities related to
> mitigation and emergency assistance in the case
> of occurred disasters. To this effect, this
> entity would in particular be in charge of
> ensuring the compliance with civil defense
> requirements of new public and private
> industrial, commercial, social and residential
> investment, preparing contingency plans for
> hazardous industrial plants, and assisting
> public and private sector entities in
> establishing guidelines for emergency
> situations (Jakob, 1989: 5).

Organizational modifications were also instituted at below the federal level and within the private sector. For example, specific groups such as the Red Cross and the metro system changed the disaster preparedness stance of their agencies. In addition, new interorganizational linkages were created for purposes of disaster planning.

From a practical point of view, our observations that post recovery organizational disaster planning can occur, is encouraging. It indicates to those officials and those organizations who are

interested in change, that it is sometimes possible to alter predisaster structures and functions. The research literature is replete with admonitions for planners and operational personnel to take "advantage" of a disaster situation to bring about alterations and modifications that will improve the planning in place. The Mexican example shows that a window of opportunity provided by a disaster can be sometimes used. Recovery measures can be employed for mitigation purposes.

From a more theoretical viewpoint, the organizational change that did occur after the earthquake suggests that there is a need to better understand what will activate a "political will" to do something. It has long been known that simply having an experience of a disaster does not in itself create the sufficient conditions to generate changes in community and group structures and functions (Weller, 1974). Stallings points to one possible initial point of attack on the problem:

> Environmental variables are the key to explanations of organizational change whether short-term, temporary alterations or longer-term, permanent change...rational adaptation theory...posits that organizational change in the form of internal structural adjustments is the result of deliberate human decisions intended to better position the organization in its environment (Stallings, 1987: 241).

But if this is so, we need to learn more about the specific political circumstances which are required to alter system and organizational aspects in the way they did in Mexico.

The organizational changes at the national level and how successful it will be was not a concern of our study. But that the process is necessarily a slow and difficult one is partly illustrated by one of our earlier reported findings about individual behavior in response to the earthquake, namely that knowledge about the new disaster organization and what it did was very vague among the residents of Mexico City. This observation also suggests that while analytically individual and organizational behavior can be separated, there is often a connection between the two levels of behavior.

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We will discuss that:
  (1) there was heavy dependence on mass media accounts for news and information about the disaster;
  (2) little dissatisfaction was expressed with the organized response to the earthquake;
  (3) dissatisfaction did not increase in the following year;
  (4) even the well noted problem of sheltering was not a source of dissatisfaction; and.
  (5) victims did not learn much from the experience of the earthquake.

1. There was heavy dependence on mass media accounts for information during the emergency period.

By almost any criteria that could be used, the population of Mexico City turned very extensively to using the various mass media sources available right after the impact of the disaster. Audience numbers were massive and the amounts of time given to attending to the mass media depiction of the earthquake was equally impressive. It almost appears that at certain hours in the first few post-impact days that except for those directly responding to the effects of the earthquake (such as those engaged in search and rescue, or victims moving to the homes of their relatives), practically everyone else was listening to a radio set, watching a television screen, and/or reading a newspaper. In one sense of the phrase, there was a "mass assault" on the mass communication outlets in the metropolitan area of Mexico City. Furthermore, there were relatively few complaints and little dissatisfaction expressed about the media coverage of the disaster and their depiction of events.

These observations on media use document what up to now has mostly been derived from anecdotal kinds of impressions rather than from systematic empirical data (as noted in a state of the art review by Kreps, 1980, but for research since that review that has looked at audience behavior see Ledingham and Massel-Walters, 1984; Beady and Bolin, 1986; Perry and Mushkatel, 1986; Mikami and Hashimoto, 1990). Furthermore, on the whole, the population of Mexico City seemed generally satisfied with what they obtained from the mass media sources in both the short and long run--a matter about which the general research literature has little evidence (Quarantelli, 1989: 15) although some Japanese studies have attempted to ascertain the views of the audience with regard to what the mass media provided in disasters (see a forthcoming volume to be edited by Quarantelli and Japanese colleagues). In fact, if anything, there has been the implication in the literature that the public is negative over some of the mass media content produced in disasters (see summaries in Drabek, 1986: 166, 336-338).

From an operational or practical viewpoint, it seems that it is possible in certain crisis situations for the mass media to provide disaster content which the general population does not find wanting. Unfortunately, since in the main we could not do any content analyses of what was reported, we can make no direct link between the overall satisfaction expressed and what was actually broadcast, telecast or printed. However, this case does illustrate that disaster planners and managers probably should not have any doubt that those who experience a major disaster will turn, if it is functioning, to the community mass communication system.

The theoretical understanding of mass communications in disasters is uneven and incomplete (see Walters, Wilkins and Walters, 1989). There is some knowledge of how the mass media system and the organizations within it operate (for a report on recent and very systematic research on the activities of mass media organizations in disasters see Wenger and Quarantelli, 1989; for an empirical study on the Loma Prieta earthquake, see Rogers, Berndt, Harris and Minizer, 1990). Our Mexico study has contributed to an understanding of the mass communication behavior of individuals or audiences in disaster occasions. What is now needed are models which will link the two, that is, the behavior of mass communication organizations and the behavior of audiences of mass media systems.

2. There was little dissatisfaction expressed with organizational efforts during the emergency period.

The Mexicans in our survey did note there were a variety of problems or difficulties in the immediate and longer post disaster organized efforts to cope with the earthquake. They did not perceive or assume that everything was perfect; far from it. But what stands out is what might be called an unwillingness to particularly blame any officials and/or groups for failures to solve the problems or inability to handle difficulties. This was true whether perceptions and evaluations were of the general organized response of the activities of specific organizations or particular tasks.

We should also note that two surveys confined to impacted neighborhoods carried out by Mexican public health authorities within 30 days after the earthquake reported similar findings to ours. Thus, they (Cervantes, Carrillo and Cejudo) write in an English abstract of their work that while respondents reported many problems such as with the water supply and that an intense migration of inhabitants took place with an initial concentration of the population in less damaged households:

> both official and private actions were generally considered efficacious in solving the immediate needs for food, medical care, and provisional housing (1986: 536).

Such a lack of complaining about the formal organized efforts to cope with a disaster is _not_ consistent with much of what is reported in previous research. A general theme in the literature instead is that in the post impact period (and sometimes even going back to organizational behaviors in preimpact times) there often are complaints and condemnations about what was done or not done, and frequently specific organizations are singled out unfavorably (e.g., in the 1960s the American Red Cross was in many disasters very negatively evaluated for its shorter run organizational performance; see Taylor, Zurcher and Key, 1970--for a more positive evaluation at the present time of it and many other responding groups see Rossi et al., 1983: 165). In Mexico even though several organizations carried with them into the earthquake period a negative preimpact popular assessment, there was not a great unfavorable evaluation of both immediate and longer run performances (at least in percentage terms).

Also, in the immediate aftermath of the earthquake, there was considerable speculation about possible political implications. Such thinking was not inconsistent with what we summarized about earlier literature on the Mexican political system. There was some thought that the earthquake might lead to a period of political instability with the worst scenario suggested modeled after the ouster of Somoza in Nicaragua after the Managua earthquake. There were also speculations that the personal style of the President of Mexico which differed from the style of "traditional" politicians would not fit the demands made on the top governmental position at the time. But out survey data clearly shows the very positive evaluation which the President was given in the emergency period and which was still present a year after the earthquake.

At the very least, the study in Mexico indicates that it should not be automatically assumed that when there are organizational problems in dealing with disaster response, there will be very negative evaluations of the involved groups. Of course, this observation raises perhaps more important questions: what are the conditions which will generate such a reaction in a population, and will kind of reaction by individuals be found in all societies? These are issues which we will address later in our discussion of the general applicability of our findings in the Mexican earthquake to other disastrous social occasions as might occur in the United States.

3. There was no noticeable increase in dissatisfaction with organizational performance during the year following the earthquake.

Apart from the matter of relative absence of complaints about the organizational response as just discussed in the previous thematic finding, it was also noticeable that there was no general increase in negativism about problems through time. It might be

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understandable that victims could ignore the many problematical aspects that arose right after what might be considered a rather unexpected disaster, but this attitude of insouciance would seem less likely if problems persisted or emerged in the later recovery and reconstruction periods. But in the Mexican earthquake aftermath, there was no noticeable increase in the perceptions of problems or in the evaluations of how they were generally handled. The "bitch phase" in the recovery phase as some have phrased it (Drabek, 1986: 229) did not appear. In fact, with respect to some problems, there was more positive evaluations of how they were handled a year after the disaster than immediately afterwards.

The prior research literature suggests that while there might be a high degree of social consensus and community solidarity at the emergency time period of disasters, in the longer run a more negative converse reaction will appear (Quarantelli and Dynes, 1976; see also Form and Nosow, 1958: 118; Bates et al., 1963; and Mileti, Drabek and Haas, 1975: 107). To some extent the political demonstrations that occurred in Mexico City in the weeks and months following the earthquake seemed consistent with the idea that there will be a post recovery time period increase in attribution of problems, a growing disillusionment with the assistance provided, and/or the emergence of a conflict orientation. However, our survey data failed to find that in the population as a whole that there was in the recovery period the development of many negative or unfavorable attitudes, major disappointments with how earthquake related problems were handled in general, and/or the assignation of blame for the problems on something or someone.

However, we should note that perhaps there were some longer run and indirect political "effects" of the earthquake. In the 1988 elections in Mexico City, for example, the candidate for the governing party (PRI) lost in a middle class district located in one of the areas most affected by the earthquake, and the PRI lost Mexico City in the Presidential election to an opposition candidate (Davison, 1988:11). It could also be argued that while the disaster may not have created more opposition to the government, it may have reinforced those segments of the population, especially from the middle classes, who were already unhappy with the political situation prior to the earthquake. It should be noted that recent social science analyses, while indicating that the 1988 Mexican Presidential election was a turning point in electoral politics and the start of a new political era, the voting patterns manifested were merely continuations of long existing trends in Mexican society (see Butler and Bustamante, 1990).

While the empirical findings are a clear indication that individual negativism or unhappiness will not automatically appear in the recovery stage after the so-called "honeymoon" phase of a disaster impact, the possible longer run consequences do raise the interesting question of why and when it will occur. We will discuss two of the more obvious possible answers in the next

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chapter, when we will consider if sociocultural factors made the population fairly accepting of whatever occurred.

From a more theoretical point of view, the Mexican City earthquake does suggest that there may be more of a connection between the political context and the governmental response in a disaster than researchers in the United States have explicitly acknowledged. We need better theories that will force us to view disasters and responses to them in the political context of the societies in which they occur. This of course is a theme of some European disaster theorists who have criticized the empirical work undertaken in the United States (Schorr, 1987); actually the same point has been made even in the northern part of the North American continent (see Brown and Goldin, 1973; Taylor, 1978).

4. Although the problem of sheltering was massive in scope, there was little dissatisfaction concerning the matter.

Our survey data indicated massive movements with respect to sheltering and housing. Not only were evacuees (and others who moved) absorbed into the homes of kin, but they were housed for relatively long periods of time. Particularly noticeable also was that there was little expression of overt dissatisfaction by either the large numbers of movers or the households which received them. Most of those involved in the Mexican situation seemed to treat the whole process with considerable equanimity.

The previous literature indicates that while those forced out of their homes by a disaster will initially be taken readily into the houses of relatives and friends, there is a strong tendency for the welcoming attitude to wear out relatively quickly (see Quarantelli, 1984c). This has been observed as far back as the studies done on long run evacuation in the Holland flood of 1953 (Lammers, 1955). This does not seem to have occurred in Mexico. Furthermore, friends and public agencies in Mexico City as compared to relatives appear to have played a lesser role in sheltering and housing than has been suggested in the literature (e.g., "The more severe the impact of a disaster on a family, the less likely will that family rely solely on extended kin for recovery aid", Bolin 1976: 275; also Bolin and Bolton, 1983).

We have additional confirmation in this study that victims of disasters, if necessary, will find their own housing. But we suspect that the atypical lack of complaints all around about the situation may stem from two factors somewhat specific to Mexico. There is a severe housing shortage in Mexico City on an everyday basis and apparently people are used to having to help out family and kin on that matter. It is also possible that the relatively easy acceptance of what could have been a major source of problems and derivative difficulties has to do with certain sociocultural values in Mexican society, a point we shall discuss again later in

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the section of the report on the applicability of these findings to possible similar situations in the United States.

5. Individuals did not learn very much on how to prepare for future disasters from their experience of the earthquake.

At a superficial level, residents in Mexico City appeared to have somewhat learned from the experience of the earthquake on how to prepare for and react in future disasters. But in reality we could see little evidence that much of relevance had actually been incorporated into everyday personal and household behaviors. Even knowledge of what the government had done by way of preparedness for future disasters was also almost nonexistent. Certainly there was no noticeable tendency to leave the area which was recognized as dangerous.

This general lack of learning by individuals is an observation fairly consistent with what has been previously reported in the literature, although the year long period we studied is by far a much longer time span than has usually been examined in most other research (see summaries of studies in Drabek, 1986: 349-360). That disaster victims will remain in an endangered area has also been long recognized (White, 1974). While some relevant disaster related preparedness learning does sometime occur, it is relatively rare (except for the learning of cues that might indicate the possibility of the future occurrence of a similar disaster event). Therefore, it would appear probable that just as organizations usually seem to learn very little from only the experience of undergoing a disaster (see Warheit, 1968; Anderson, 1969a), so do individuals also fail to learn lessons for future preparedness if that is all that happens.

While the thematic observation stated here is not new, it was derived from a far larger than usual disaster where a possibly different result might have been anticipated. But is seems that just as the dramatic nature of a disaster is not enough to occasion learning, neither is a bigger disaster per se likely to do so. This reinforces the need to examine further why a disaster experience contributes so little to personal learning. Our major hypothesis drawn from DRC studies of organizational learning is that actual experience needs to be reinforced by a supportive and directive social context (see Ross, 1978). If this proposition is validated by further research, it will give to disaster planners some guidance on how they could build upon the experience of citizens in community disasters to better prepare for future ones. There is little in what we found in our Mexican study to encourage planners and managers to think that if people in their localities undergo a disaster, they will automatically be better prepared for future ones (in fact, there is the possible dysfunctional consequence of a "near miss", having survived a disaster there may be the feeling that there is no great need to prepare for another one).

Chapter 10

COMPARATIVE SIMILARITIES AND DIFFERENCES

How typically were the responses in Mexico City? To what extent can we extrapolate the findings from Mexico to the United States? This chapter considers these questions.

Generally speaking, there were comparative similarities and differences in the individual and group patterns which appeared after the earthquake. That is, many responses were identical or similar to those which would likely to be observed in a disaster in a community north of the border or even elsewhere in the world. However, certain aspects of the organizational and individual behaviors seemed to differ either quantatively or qualitatively from what has been typically found in past disasters in the United States. We will now separately discuss these two patterns, particularly what might account for the comparative differences.

Similarities

Very apparent are the many similarities between what we observed in Mexico City and what has been found in hundreds of studies of disasters in the United States (Barton, 1970; Dynes, 1974; Mileti, Drabek and Haas, 1975; Quarantelli, 1978; and Drabek, 1986). There are many similarities in behavior. Seemingly much of the emergency time response is not affected by different sets of sociocultural values and beliefs, sociostructural differences, or by situational contingencies in the two countries.

Thus, in both societies, for example, many volunteers to deal with disaster generated tasks appear both in the short and long run; individuals around impacted sites are the initial responders in search and rescue; the injured are not given triage; those needing shelter go to relatives; heavy use is made of mass media accounts for news about a disaster; victims learn relatively little from their experience; organizations with relevant tasks attempt to respond as quickly as they can; formal interorganizational ties prove problematical; authority/command structures are initially ignored in an effort to do something; emergent groups of all kinds appear; organizational role conflict is not a problem; resource allocation is more of an organizational problems than resource availability, etc.

If nothing else, the study in Mexico supports the universality of certain kinds of behavioral response patterns, both on the part of individuals and of organizations. Let us note eight of these

similarities, all of which cut across the individual-organizational distinction, in more detail, and suggest how extensive they are cross-societally.

a. Search and rescue. The great majority of search and rescue is undertaken by individuals and informal groups of citizens and is underway immediately after disaster impact. The vast bulk of survivors are found in the first few hours. Some localities get researched often. All this happened in Mexico City and typically happens in disasters in the United States (Mileti, 1975). The somewhat later and more organized extensive involvement of extending organizations in search and rescue activities has also been often observed in community disasters in the United States. This task is seldom the responsibility of any one specific organization, so many and varied groups that possess relevant personnel and resources undertake the task (see Drabek, Tamminga, Kilijanek and Adams, 1981). Very few are rescued or bodies found by later arriving search teams from outside the community. Similar search and rescue patterns have been reported in disasters elsewhere in the world including developing countries.

b. Convergence. In the capital of Mexico there was an initial mass convergence of personnel upon specific disaster sites, and a similar convergence of material and supplies quickly followed. This created numerous difficulties for the different extending and expanding organizations. The process especially created many difficulties in the integrated use of resources. The appearance of a convergence problem has been so often noted in studies in the United States that it has almost taken on the stature of a "law" among disaster researchers (especially since its first depiction by Fritz and Mathewson, 1957) and it has been reported in major disasters many places around the world (Drabek, 1986: 174-175).

c. Volunteering. The massive volunteerism and the manifestation of altruistic behavior that epitomized the response in Mexico City has also been frequently observed in the United States and elsewhere, although not everywhere. Some of the earliest disaster studies have reported this pattern (e.g. Barton, 1970). The problems of integrating the actions of individual and group volunteers with organizational activities has also been noted in many different disasters (Form and Nosow, 1957; Dynes, 1974) and has proved problematical in many places around the world (see Drabek, 1986: 196-197). However, both individual and group volunteering might be related to different socio-cultural values.

d. Sheltering. The patterns of shelter utilization that appeared in Mexico City also are similar to what has been observed in the United States (Quarantelli, 1984c). Although hundreds of thousands were homeless, and a large number of public shelters and camps were established, they were not utilized by the very many forced out of their homes, except for a few from the lower socio-economic strata. Victims moved in with relatives or provided their own shelters,

often in areas close to their damaged homes. These are very common patterns in major disasters almost anywhere in the world, and fail to appear only when an area is totally physically devastated as was true in the Friuli earthquake in Italy (see Geipel, 1982) or the Yungay, Peru avalanche (Oliver-Smith, 1977).

e. Security and access. As occurred in Mexico City, quickly establishing security around impacted sites is a typical disaster response. But usually too there is eventual disagreements, and disputes emerge involving organizations with other organizations and citizens with organizations over who has legitimate access to an area (Wenger, Quarantelli, and Dynes, 1989). This has also been reported elsewhere such as Italy, Sweden, Holland and Peru (Drabek, 1986: 230-231). Unplanned efforts to institute pass systems and circumventing of them by individuals and groups are likewise common in the United States. Although military control was not imposed in Mexico, whether the imposition of martial law or rule in disaster in some countries reduces these problems, is unclear.

f. Needed resources. Typically in almost all disasters in the United States, it is not the absence of but the integrated use of resources that is problematical (Dynes, 1974), as was also the case in Mexico. In fact, often there are more people, goods and equipment available than can be efficiently used. Occasional exceptions are when organizations need specialized equipment or personnel, as for instance in undertaking work on collapsed high rise buildings (Olson and Olson, 1987), or unusual demands on facilities (e.g., space to process very large number of dead bodies, see Hershiser and Quarantelli, 1976). Moreover, resources may be needed in societies which on an everyday basis are resource poor or lacking at the time of the disaster (Quarantelli, 1986).

g. Information distribution. The extensive heavy involvement of mass communication organizations in post impact reporting is almost universal in the world (Quarantelli, 1989). Heavy usage by the population of news and information transmitted by the mass media organizations has been noted in other societies such as Japan (Hiro, Mikami and Miyata, 1985). The dependence on mass media accounts by responding organizations to learn about the disaster, as occurred in Mexico City, has also been observed in the United States (Quarantelli, 1989: 17). To some extent this pattern would appear to be dependent on the existence of a completely evolved mass communication system, which is not the case for all contemporary societies, especially in the developing world.

h. Responsiveness. Both individuals and organizations in Mexico City attempted to do what they could as soon as possible after impact. There was not, as is also typical in the United States, a failure to respond because of being psychologically stunned, affected by role conflict, or otherwise being rendered passive by the disaster impact and its effects (Drabek, 1986: on individual behavior, see 133-142, on organizational behavior, see 158-160).

This is not to say all responded immediately or necessarily effectively but:

> people do not abandon their social histories when confronted with adversity--and organizational systems reflect it (Drabek, 1986: 158).

While there is no reason to think that this does not hold true in all societies, the data base on this is weak especially for developing countries, although our Mexican case is suggestive.

We are not saying that the patterns in Mexico City, even in the indicated dimensions, were identical to that which appear in disasters in the United States. However, with respect to these activities and others, there is a general similarity. Knowing what the pattern is in one society, allows a good prediction of what is likely to appear in the other society along the indicated dimensions.

Differences

While there were many observed similarities in responses, there were also some differences. These aspects may not be and are probably not unique to Mexico, but they are different from what might be anticipated in the United States, if not elsewhere. In some ways, what we will note can be thought of as being rooted in certain social characteristics of Mexican society which, however, Mexico may share with other social systems.

We will discuss six dimensions in which there were enough notable differences to lead us to at least question the full and direct transferability of our impressions and conclusions from the earthquake to disasters in the United States. These dimensions, in our analytical approach, have to do with certain structural, organizational, political, cultural, social class and social value characteristics which are partly different in Mexico and in the United States. Some of the response patterns and differences are rather substantial, but others are more dissimilarities in degree, than in kind.

We will attempt to clarify these points by first asking a general question, and then discussing what possible answers might be given. In part we also challenge whether certain analytical distinctions which we and other researchers often use might not be better qualified or limited in some ways.

(1) Does as much decentralized and uncoordinated behavior appear in disasters in the United States as we observed in Mexico?

As noted earlier, we found much decentralized and nonintegrated behavior. It was more than we _initially_ expected in Mexico.

However, leaving that aside, a simple answer to the question is not possible. Our later analysis suggests we could anticipate more or less of a decentralized response in disasters in the United States, depending on the degree of urbanization or metropolitanization involved.

There are two issues which need to be raised concerning the way in which certain structural variables, commonly used in comparative studies, were involved in our findings. First, we initially assumed that the Mexican political system was more centralized than the political system in the United States. Second, we equally assumed that because of differences in the level of urbanization and industrialization that Mexico City would be less complex than urban areas in the United States.

On the issue of centralization, most scholars of Mexican political life identify centralization as one distinctive feature of the evolution of that political structure (see for example most of the authors cited in Chapter 1). But there may be several dimensions of centralization, and not all of them will vary together. For instance, McLuckie (1977) in his study of disasters in three different societies---the United States, Italy and Japan---used centralization as a major explanatory variable. He pointed out that in the literature on political development, centralization was used in two different ways: first, to describe the structure of power, and second, to describe the pattern of decision making.

Using that distinction, the Mexico City situation might illustrate centralization in the structure of power, but given that context, there is considerable autonomy in decision making at lower levels of the government. While we could not fully document that this specific variant of "centralization" exists on a daily basis for Mexico City, we do know it does approximate what we observed during the early phases of the emergency period. The point being raised here is that centralization may not always be a useful concept on which societies can be compared. In some "centralized" societies, there still is considerable autonomy in decision making at lower governmental levels, especially in an emergency. This was true in Mexico, and probably is true elsewhere, especially in developing countries.

On the issue of structural complexity, sometimes there is a tendency to think of "developing" countries as structurally less complex across-the-board than are "developed" countries. (The very terms used---developed and developing reinforce that perception). Quarantelli (1986) has challenged this in terms of disaster preparedness planning. In fact, the Mexico City situation provides a good illustration of the point that structural complexity can exist within the context of less complexity in the overall societal structure. The complexity which existed in the metropolitan area of the capital of Mexico is a classic example of that proposition. The largest urban configuration in the world contains a federal

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district with the capital of the nation located within its boundaries. Federal and district agencies have overlapping functional responsibilities. By any criteria, there is a very complex social structure in that situation.

Now there can also be substantial structural similarities and differences in the range of communities within a given society. If so, organized response in one locality could vary considerably from that in another. On one level, this complexity suggests that caution should be exercised in generalizing findings of organizational response from the Mexico City situation to all community responses in the United States. There is both more and less structural complexity than is true of Mexico City. Some less urbanized communities in the United States have far less complexity whereas some metropolitan areas may be even more complex.

The closest parallel to the capital of Mexico would be the Federal district in Washington, D.C., but there would still be considerable differences in a response situation. Local government within Washington possesses considerably more autonomy than is the case in Mexico City, and there is no counter part to the delegaciones. The role of the Federal government could be expected to be much different than what was observed in Mexico City. Given not only the issues of complexity and location, there is a mandate also that emergency response to disasters in the United States is primarily a local responsibility (although this does not deny that the system along many lines is one of "shared governance", see May and Williams, 1986). What DRC observed of the response in Washington, D.C. to other kinds of community crises, such as civil disturbances and potential disruptive massive assemblages of people in the 1970s, is supportive of the notion of a very decentralized planning and response pattern at the local community level.

But even noting these differences between Mexico City and Washington, D.C., there are nonetheless impressive similarities when organizational response behavior is compared. The organizations we studied in Mexico, both public and private, seemed to react and to have the same kinds of problems repeatedly reported for similar organizations reacting to disasters in the United States (Quarantelli, 1985d). We would argue that there are many universals in the behavior of organizations that cut across national social systems and this is true in disasters as well as other areas of social life. Some of these similarities in organizational behavior may be due primarily to similarities in organizational complexities which characterize cities around the world, regardless of their specific cultural setting.

In effect, we are saying that the large number and complex relationships of formal organizational entities in any metropolitan area may be more important in disaster preparedness and response than the sociocultural context in which such organizations are embedded. Preoccupation with differences in cultural values and

beliefs can obscure similarities in social structure. Thus, a disaster response in a similar disaster in Los Angeles, for instance, might show a similar decentralized pattern as was observed in Mexico City, but this would not necessarily be true of a small town in Ohio or Delaware. (Green, 1984, in an analysis of disaster oriented groups in rural and urban areas in the United States found those in the latter to be more decentralized in decision making than those in the former).

(2) Do we see as much extending and emergent organizational behaviors in disasters in the United State as we saw in Mexico City?

At one level, there appeared to have been more extending and emergent behaviors in Mexico than has typically been reported in the United States. If so, what might account for the difference? There are a number of possibilities, but we think the major explanation lies in the nature of the large work organizations that exist in Mexico City.

It is possible that the seeming differences being noted here are partly a function of the way disaster reporting and researching is mostly undertaken in the United States. The Disaster Research Center, for example, has increasingly come to believe that there is a considerable underreporting or underdocumenting of emergent behavior in disasters. Organizations in retrospectively describing disaster activities or writing after action disaster accounts tend to report traditional and usual behaviors rather than what is seen as bureaucratically divergent, if not deviant behavior (Quarantelli, 1987a).

Disaster researchers too tend to look for regularized behavioral patterns rather than more infrequent and noncontinuing actions. Mass media accounts also, for a variety of reasons, will tend to miss much emergent behavior, for example, reporting on the later formal search and rescue efforts and having little if anything at all on the much more important informal search and rescue immediately initiated by survivors (see the content analysis touching on this point in Quarantelli and Wenger, 1990).

However, even if we accept the validity to some extent of the above methodological point, it does appear that extending and emergent behaviors appeared in Mexico more often than is typical in disasters in the United States. There are several possible explanations for this.

For one, there was very little prior planning for disasters in Mexico. Even though the level of disaster planning is still deficient in many cities in the United States (see Wenger, Quarantelli and Dynes, 1986), most of them have prepared better for disasters than did Mexico City, at least relatively speaking. Thus, it is possible that the considerable extending and emergent

response that appeared in the Mexican earthquake does not usually appear in the United States because of prior planning.

Also, in almost all the formal organizations we studied, work brigades to undertake disaster tasks were quickly formed. Their appearance was _not_ the result of any preplanning. Rather they seemed to have emerged in part because many of the Mexican work organizations seem to be at the center of loyalty of many of their employees. Part of this difference may reside in a more "paternalistic" view of employees, having more to do with their "total" welfare than might be found in organizations in many other societies where work is a contractual time obligation. This difference is translated into the ability of non-disaster related organizations to mobilize their human and material resources rather quickly and effectively to perform needed disaster tasks. The more significant roles which extending organizations and emergent groups played in the emergency period in Mexico was in contrast to what might be expected in many other settings, especially in the United States. The contrast here is not to imply differences in helping behavior among different populations, but the fact that many work organizations in Mexico seemingly are a rather efficient social mechanism for mobilizing assistance.

Because of the differing political and economic systems, many organizations in Mexico are "governmental" that in many cities in the United States would be part of the private sector. This observation applies to a wide variety of enterprises and activities including transportation and some lifeline and medical services. Functionally similar but private groups in the United States might respond rather different than did the public governmental agencies in Mexico. Again of course many other countries around the world would more resemble Mexico in this pattern than they would the United States, and therefore might be expected to show the same kinds of response behaviors in disasters.

Certain distinctive patterns emerged in the organizational response pattern in Mexico City that should not be as readily expected in the United States. For instance, PEMEX played a major role in the disaster and undertook a wide variety of tasks, almost all on its own initiative. Because of its massive resources (and lack of significant damage to its own operations and facilities) it could act the way it did. Most communities in the United States generally lack such huge, resource rich organizations, and it is also difficult to see many even large corporations taking the lead role PEMEX did in the earthquake. Much of the corporate level disaster planning that is occurring in such areas as California seems to assume that the major responsibility of the organization is to restore its own functioning and take care of its own workers, rather than helping others in the larger community.

(3) Why are changes in disaster structures and functions with respect to disaster planning more likely to be the result of political considerations in Mexico than in the United States?

As indicated earlier many organizations in Mexico not only appeared to retrospectively recognize the value of disaster planning but went on to implement new relevant structures and functions. Clearly part of the impetus for change can be attributed to the fact that officials in Mexican organizations, if our informants were representative of a larger number of policy and decision makers, became aware in retrospect of the negative consequences of a lack of planning. They observed that their lack of prior planning had created serious difficulties for their groups and resulted in an inefficient response. Even where there had been some prior, although limited, internal emergency planning, the demands of the situation exceeded the capabilities of the organizations to respond. Most earthquake related tasks had to be improvised. Emergent ad hoc behavior was the norm. The lack of planning seriously hindered coordination among the responding groups. Organizational personnel not only lacked knowledge about the resources and capabilities of other groups, but they also did not know who to contact to gather that information and integrate their effort. The major exception to this is where groups had normal day-to-day contact with other relevant groups, which in some respects represented a form of unintended planning.

The expressed desire to prepare better for the future is a typical organizational afterreaction to disasters almost anywhere in the world. However, what seemed to differentiate the post impact recovery situation in Mexico City from what typically occurs in the wake of most disasters was that there was the "political will" to do something at the highest levels of the government. It was more than just recognition that planning could make a difference.

In the Mexican context, there appears to have been a perception that in a future similar disastrous occasion, the negative political consequences could create destabilizing factors for the total social system and serious problems for the continuance in power and government of the ruling party, the PRI. As we noted earlier in Chapter 3 in presenting the political and governmental context, there were certain inherent stresses and strains in the Mexican social system. Whether the concern that another disaster could be so dysfunctional was a correct perception or not could not be examined by our study, but the belief seems to have supported a "political will" to do something as bureaucratically drastic as creating a new disaster oriented organization (changes and modifications in disaster planning at organizational levels below the very top could also be explained in the same way).

The perception was supported by certain public demonstrations and anti-regime crowd behavior in the aftermath of the disaster even though our survey studies showed little across-the-board negative

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views of the government and its actions in the earthquake. But even symbolic actions, such as public protests, can be used in very important ways in the development of collective behavior and social movements directed at an existing government (see Turner and Killian, 1987: 286-308). So the perception that the earthquake effects were being used by opposition groups was in that sense not inconsequential. The "political will" for action was related to the operative political context.

Of course disaster occasions in the United States are not devoid of political overtones, although the matter has been little addressed in the American research literature except for the use of international disaster relief as a "political weapon" (for the absence of studies see Taylor, 1978; for a discussion of the politics of aid distribution, see Glantz, 1976; Committee on International Disaster Assistance, 1978). The decision on whether or not to have a federal declaration of a disaster are sometime influenced by political considerations. The massive convergence on major disaster sites of governmental officials from the President of the United States to the local village officeholders is not wholly guided by humanitarian or even governmental efficiency concerns. And even the most recent changes in the federal disaster relief act which structures much of the national response to a major disaster can be attributed to factors operative in the political system of the society.

Political considerations are even more explicit and apparent outside of the emergency time period, in particular disaster mitigation and recovery activities, for example (see Wyner, 1984; Rubin and Barbee, 1985). So even though disaster researchers have not undertaken much systematic research on the question, politics do seem to play an important role in some disaster planning and response aspects in the United States.

Nevertheless, political considerations were even more prominent in the Mexico City earthquake than they are comparatively likely to be in disasters in the United States. That is, it is difficult to see parallel consequences in both countries for disaster planning. The threat to national stability and their power that the PRI saw in Mexico is not an equally viable scenario north of the Rio Grande. As such, political aspects are far less likely to be a factor in the development of disaster planning at any governmental level, federal, state of community. (It is however interesting that some recent institution of disaster planning in certain parts of the private sector in the United States and Europe, among corporate entities such as nuclear power and chemical companies, does have some overtones of mitigating threats to the economic stability and political powers of the private sector segments involved, see for example, Lagadec, 1982; Shirvasta, 1987; Rosenthal, Charles and Hart, 1989).

However, this is not say that political considerations might not come to loom large in any given major disaster or catastrophe in the United States. While not likely, it is not totally improbable. In fact, because blame assignment for impact aftereffects are more likely in the United States than in Mexico, as we shall discuss below, it is possible to visualize a possible convergence of political considerations and the seeking of some people or groups to blame for some disaster outcomes.

The structural, organizational and political aspects we have discussed seem more applicable at the macro rather than the micro level. When we turn to individuals and households, other aspects, such as different cultural norms, social class beliefs and social values seem more important in an explanation of the observed comparative differences.

(4) While there was identification of many problems, why did less blame assignment occur in Mexico City than appears to be the case in disasters in the United States?

In contrast to what is usually observed in the United States, the population in Mexico City expressed little dissatisfaction with organizational performances in and after the earthquake. Also, citizens did not change their evaluations over time and did not express dissatisfaction even in connection with the most singled out problem--that of sheltering the victims of the disaster.

There seem to be certain findings in the study which point to significant cultural differences which are worthy of additional consideration. First, we found in our research a relative absence of fault finding, blame, or attribution of problems to what specific organizations, or, more abstractly the government did or did not do in the aftermath of the earthquake. From the perspective of many in the United States, the reaction would seem rather passive, non-challenging of authority, if not almost a simple manifestation of a fatalistic attitude of "what will be, will be". Certainly research in the United States has indicated that disaster victims tend to be more active in their reactions to disaster-related difficulties and quick to blame organizations for failures to solve problems (see, e.g., Barton, 1970; Dynes, 1974; Mileti, Drabek and Haas, 1975; Drabek, 1986).
In fact, in disasters of much less magnitude and impact than the Mexican earthquake, individuals in the United States have reacted far more strongly and negatively to what happened. Also, there is a tendency for proactive rather than just reactive responses to even just the potential possibility of a disaster in certain communities in the United States, as reflected by the numerous emergent citizen groups that have surfaced in recent years to deal with threats of and not actual impacts of disasters (Quarantelli, 1988a). These differences, as well as others in the two societies as far as disasters are concerned, could be primarily attributed

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to some of the ways they differ in some of their sociocultural values and beliefs.

What seems striking in our Mexican study is the lack of criticism of the major actors in the emergency response, namely the Presidency and the DDF while the military and police received less positive evaluations. It is quite possible that those more negative evaluations were rooted in predisaster attitudes towards the police and the military, rather than being derived exclusively from their activities in the emergency. While there were pockets of dissatisfaction which were expressed in the form of public demonstrations which received considerable mass media attention, our data suggest that such dissatisfaction was neither deep nor widespread. Perhaps the more paternalistic stance of the Mexican government, which a number of observers have noted, provides a buffer against the assignment of blame.

By contrast, we would expect in the United States more widespread criticism of various agencies and entities in the emergency response or in the immediate recovery period. In fact, in two recent very major disasters in the United States, the Loma Prieta earthquake and Hurricane Hugo, there was considerable public criticism of the federal government, the lead federal agency in both responses, namely the Federal Emergency Management Agency (FEMA), and various other federal, state and local governmental groups involved in the emergency and immediate recovery efforts.

This difference in the two societies may, of course, be due to cultural differences in the expectations of governmental services or even more broadly what might be expected of life. For example, some students of Mexico have contrasted some cross-cultural differences:

> When [Reavis] contrasts the Mexican and American views of life, death and the world he does it sharply and with rhythm. After listing what Americans do (they "believe that for every problem there is a solution, that nothing is beyond human understanding", ...Mr. Reavis then presents his view of the Mexican way ("Mexicans do not do any of these things," he writes, "because they don't believe in them. They don't believe that life is fair, or that it makes any sense at all")..."Mexicans don't necessarily want to change" (Castaneda, 1990 in a review of the book Conversations With Moctezuma: Ancient Shadows Over Modern Life in Mexico).

Another possibility is suggested by some recent general work on political cultures. It creates a typology of five ways of life-- egalitarianism, fatalism, individualism, hierarchy, and autonomy

(Thompson, Ellis and Wildavsky, 1990). If in general and ideal type terms Mexicans might be categorized as fatalistic and people in the United States as individualistic, this would have implications in their respective cultural expectations of disasters and how their governments ought to respond to them.

(5) Why are social class differences in reactions and responses in the United States not as sharp as they were in Mexico?

The variable of social class was more important than we anticipated prior to the study. If there was one background factor in both population surveys that stood out, it was social class. It affected a wide range of phenomena, for example, from the degree of initial earthquake impact that was suffered to how the individual felt about a variety of disaster related tasks activities that the government had undertaken during the year. While socioeconomic factors were not important in everything, they seemed to differentiate to a degree on most matters.

In one sense the observation that social class was an important differentiating factor should have, at least for sociologists, almost been expected. Notwithstanding that certain political ideologies deny their existence, social classes exist in all societies. However, again in contrast to particular ideological beliefs that suggest the opposite, there are substantial differences in how overtly they manifest themselves in life styles and behavioral patterns in various social systems (Kerbo, 1983; Wright, 1985). The characteristics of the social class patterns in the United States have been described in various ways (Rossides, 1976; Gilbert and Kahl, 1982), but in all conceptions there are significant differences between different strata, even though there is a tendency to deny that social hierarchies and inequalities exist (Gans, 1973).

However, socioeconomic differences conceptualized in any of the variety of different ways social scientists conceptualize them, have almost never been incorporated into studies by disaster researchers, at least by those from the United States. In fact, Taylor notes (1978: 276) that it is probably a valid criticism that the research "has been primarily undertaken on white, middle-class persons and groups". (For the rare exceptions regarding social class, see, e.g., Drabek and Boggs, 1968; Turner, 1976: 182-183; and Quarantelli, 1980: 126). Reconfirming this, Drabek (1986) in his recent inventory of the literature cites only about a half dozen studies that use socioeconomic variables in their data analyses. While some foreign theoretical criticisms of what has been called the North American disaster research tradition have alluded to the lack of socioeconomic factors in the studies done (see for example, Schorr, 1987, for summaries of this point of view expressed by German critics), very few studies done anywhere have used social class as either a descriptive or analytical variable.

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The Mexican study clearly suggests that much more attention ought to be paid to social class differences among victims, again for both theoretical and practical purposes. From a theoretical point of view, using social class differences both descriptively and analytically should provide a much more powerful research variable than standard demographic and categorical dimensions such as sex, age, education, occupation, etc., which are not as intrinsically sociological as the socioeconomic status of the person. From a practical viewpoint, for example, emergency managers who have a homogeneous social class population may have rather different sets of disaster related problems of a social nature to deal with, than those in a community with a very heterogeneous social class composition.

Second, we have already commented on the fact that social class was an important explanatory variable in the study. There is some consensus among social scientists in both countries that social class distinctions are sharper in Mexico than in the United States, and that they therefore probably are more influential in affecting overt attitudes and behaviors. One study found, for example, that beliefs about social class differences are sharper in Mexico than in the United States (see, e.g., Tarres, 1987) and another concluded that there was a greater fatalistic attitude among lower class Mexicans (see Ross, Mirowsky and Cockerham, 1983). Still other research in Mexico unrelated to disasters is supportive of our finding that lower class respondents in our survey were less negative about the government than persons in other class categories (see, for example, David, 1976; 1979).

Also, as an indication of how Mexican researchers view the matter, we can note that the Instituto de Investigacion de la Comunicacion, the organization which conducted the population surveys for DRC, used socioeconomic dimensions regularly as a matter of course to stratify and weigh their samples toward the higher strata in their studies, since they deem class differences crucial for marketing and public opinion polling (personal communication). Certain kinds of hierarchical differentiations are also often used by survey and marketing researchers in the United States, but they are generally treated primarily as an issue of income and not lifestyle.

In our discussion in Part III of this volume where we reported the survey data, we documented and stressed that social class differences consistently were involved in many of the attitudes and behaviors of the individuals we studied. Do such social differences exist in disasters in the United States and what does the Mexican data tell us about what we might not have been seeing in responses in our society ? In part this is a very difficult question to answer because social scientists in this country, although not all of them, have often downplayed class distinctions, and researchers in the disaster area have generally ignored these social hierarchical factors in their descriptions and analyses (with the few exceptions we noted earlier). Our best assessment

is that social class differences are not as significant in disaster phenomena in the United States as they are in Mexico (see, Aspe and Sigmund, 1984), but they are more important than has been recognized up to now.

This may appear to be an effort to equivocate on the matter, but that is not our intent. Instead we are saying that the findings in Mexico point out that researchers must pay more attention to social class differences in disaster responses than we have up to now; we must do so because it will give us a much better understanding of why people act and think the way they do. Taking social hierarchical differences into account will allow us to better describe and analyze what occurs to human beings in disasters. Social class to some extent has to do with the exercise of power. A disaster context is one in which power and influence should come more to the fore (Brown and Goldin, 1973: 66-105).

On the other hand, in terms of our general understanding of the United States society, we have no reason to think that the differences are or will be as important as they were in Mexico. It is up to future research to establish the degree of their importance. It is not whether they are significant; we can assume this they are. The question is how much they influence actions and perceptions in disasters. (Other than to mention it, this is not the place to discuss that when we are talking of social classes we have in mind a much broader conception of social hierarchies than is used by those researchers in the United States who sometime do employ limited kinds of socioeconomic dimensions such as income levels or occupations in their analyses).

(6) Why did the pattern of volunteering in Mexico seemed to differ from what is typically seen in disasters in the United States?

There was a greater involvement of group volunteers such as student groups, unions and work place groups, citizen organizations, and political groups in the disaster response than would normally occur in the United States. For various reasons they engender a degree of "loyalty" and sense of solidarity among their members. Because of this, much of this volunteer activity facilitates the appearance of emergent groups, that is cohesive group activities in contrast to parallel actions by a number of individual volunteers. Research observations suggest that this particular pattern is less likely to occur in the United States though it is not unknown (e.g., DRC found in the Ft.Wayne, Indiana flood of a few years ago that teams of students from particular high schools constituted the core of the group volunteers that worked on building the levees to protect the town).

The pattern of volunteering was more complex than anticipated. There was considerable differentiation in the volunteering that occurred. In absolute numbers there were many volunteers both in

the immediate post impact period and during the year following the earthquake. On the other hand, the vast majority of residents of Mexico City never got involved in volunteering activity of any kind in the first three weeks. In the emergency time period males did more volunteer work than females, but upper class persons volunteered at a rate considerably higher than lower class individuals. Later volunteers were not differentiated on those two social characteristics. The relatively younger but not the youngest undertook the most early volunteering, and volunteers generally were not from the most devastated areas after the first few hours.

This differentiated pattern of volunteering is not what on-the-scene popular beliefs or mass media stories suggested. More important, the findings strongly indicate that the current research literature on volunteering in disasters may be too simplistic in its observations. Apart from the existence of a very complex and differentiated pattern of volunteering behavior, specific generalizations are challenged by the results of this study. For example, only in a very limited sense was there a "mass assault" (as it has been called, see Drabek, 1986: 223) of individuals in this disaster. The very young have sometime been singled out as a potential great pool for individuals who could work at disaster relevant tasks (Quarantelli, 1981) or have been emphasized in mass media accounts (Phillips, 1987), but they were not a major source for volunteers in this earthquake disaster.

There are a number of implications from the complex and differentiated pattern of volunteering we found (as we have described it earlier there was not just the individual volunteering we are discussing at this point, but also the volunteering that occurred because persons were members of groups such as unions that as collective entities volunteered). At the theoretical and research level, for instance, it is clear there needs to be much greater work done on clarifying and specifying the who, when, what, and where of volunteering (for an effort to typologize volunteers including group ones, see Dynes and Quarantelli, 1980). In fact, the very concept of volunteer requires considerable theoretical attention so meaningful differentiated research on the topic can be undertaken. At the practical or operational level, it is also obvious that planning for the mobilization and use of volunteers needs to be far more sophisticated than it has tended to be, for example, in recognizing that volunteers in the early phases may be more socially differentiated than volunteers in the later or recovery stages of massive disasters such as occurred in Mexico City.

We have in this last part of the chapter stressed some of the more important social differences between the United States and Mexico in order to indicate the use of caution in using our findings in one country being directly applied to another. However, as we indicated in the first part of the chapter, there are similarities in response patterns in the two societies. Now even learning that

something can not be easily transferred from one society to another can be a valuable lesson, although we do think there are more positive and direct lessons that can be applied from the Mexican disaster to preparing for and responding to disasters in the United States.

Of course social scientists have long pointed out that different societies have rather varying sets and patterns of sociocultural values and beliefs. Such factors are involved in everything from the way nature is approached, to the conceptions of reality that are accepted, to what is deemed the proper goals and ends human beings should strive for, to what is taken for granted and what is seen as open to being questioned, etc., to mention but a few matters which have been the object of description and analysis. For example, research has established that something such as chronological time is socially reconstructed in all societies and that, for example, what is defined as "slow" in one country or culture is "fast" in another, etc., (see, e.g. Levine, 1988; McGrath, 1988).

Given that variability, there is often the attempt to look for other variables, especially structural ones on which comparisons can be made. For example, level of industrialization, degree of structural complexity, degree of political centralization, as well as other measures are often used as bench marks for comparisons. Some of our observations and findings raise more general questions about the importance of certain cultural values and of the uniformity of structural comparisons for disaster research purposes.

Chapter 11

A FUTURE RESEARCH AGENDA

We learned a number of things in designing and carrying out our study which would seem to have important implications for other disaster research and especially cross-societal studies. Thus, in this final chapter we pose five questions raised by our work and try to indicate how the answers might suggest a different approach to some matters in the future.

First, what do our study results say about the significance of small numbers? Second, does our research contribute only to other earthquake studies or can the findings be generalized to other "disaster" situations? Third, was our work on the Mexico City earthquake, a study of a disaster or a catastrophe and the implications if it were primarily one or the other? Fourth, does our work in a complex metropolitan area contribute to our understanding of disaster problems of the future? Fifth, what are the advantages and disadvantages of cross-societal research such as we undertook?

The Significance of Small Numbers

In the analysis of data, small percentages are not necessarily insignificant. In the Mexican earthquake, when only _one_ percent of our respondents reported engaging in a particular behavior, that meant several hundred thousand individuals reacted in the same relative way. To focus only on percentages or on absolute numbers will convey radically different pictures about what went on in Mexico City.

In the main, this is not an observation that has often been made in the past. Only on rare occasions have disaster researchers noted the possible theoretical insignificance, but operational importance, of small percentages (see, Quarantelli, 1985a: 199-200). We can see that this can be true in two ways. First, as in the Mexican situation when the base number is very large even tiny percentages, that are by explicit criteria statistically or theoretically unimportant, can extrapolate to very large absolute numbers. Second, the absolute number itself may be relatively low, but because of cultural values involved the phenomena can become important for symbolic reasons (e.g., burying the dead properly, see Blanshan and Quarantelli, 1981; treating the seriously wounded quickly, see Quarantelli, 1983; protecting children, etc.). The study in Mexico City suggests that those who study disasters ought to consider more seriously those findings which are not significant

in one numerical sense for most theoretical and research purposes, but which otherwise are important.

In fact, there may be a very important practical implication in this thematic research finding. It is that the discrepancy between percentages and absolute numbers with respect to behaviors of individuals may become progressively more important the larger the disaster as well as the larger the population base involved. In a small size (impact and population wise) community disaster--the occasion which is the mode in the studies undertaken in the United States (see the Inventory compiled by Quarantelli, 1984b)--the absolute numbers for much behavioral phenomena may actually involve only literally a handful of people. It is easy therefore to ignore such a possibility in disaster planning and not to notice it in the managing of the more typical kind of community disaster. However, if the disaster is very large and in a densely populated area, the matter will have to be operationally addressed both in preparedness planning and disaster response.

Agent Specific or Generic Studies?

Our study of course focused on the reactions to a very specific disaster agent, namely an earthquake. The issue we want to address is whether what we found in terms of our research findings were particularly agent specific. That is, were the observations about organizational and individual behavior response *specific* to the *earthquake* agent? In general, we would say that the answer is in the negative.

The problems that were created and occasioned the most difficulties have been observed in the response to many different type of disaster agents, natural and technological. There were problems in search and rescue, sheltering, handling the dead, transporting and treating the injured, convergence, and interorganizational coordination to mention just some. But these difficulties were not primarily the result of the physical damage and destruction that an earthquake creates, but because of the implementation of social values and the pattern of social organization that was necessary to implement those values.

What was studied was an earthquake disaster, but it probably was the magnitude of the event and its social consequences rather than the type of agent that best explains our findings. Our research observations and conclusions would appear to be relevant to any broad scoped, rapid onset event that allows for little or no forewarning and that has significant destructive potential. Whether "natural" or "technological" in nature, similar individual, group, organizational and community behaviors and problems can be expected to occur. It is the social meaning of the occasion which is important rather than its origin.

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Disaster or Catastrophe?

While the specific characteristics of the agent may not create significant social differences in the emergency response, differences in the scope of the social disruption could make a difference. Only a limited vocabulary to discuss this difference exists, namely the difference as some have posited, between a catastrophe and a disaster (Quarantelli, 1987b). The argument is that there are both quantitative and qualitative differences between a disaster and a catastrophe. For example, in a disaster, most of a community remains basically untouched and functioning; therefore there can be immediate convergence from the unaffected areas and less involved victims. In a catastrophic situation, most of the structures may be destroyed and a majority of the inhabitants will be dead or injured; most of the convergence in such an occasion will have to come from afar and from non-local sources.

Very noticeable was the fact that there were in Mexico City very few secondary threats such as from fires, dangerous chemical spills, downed power lines, collapsed dams, etc. For example, there were very few fires as a result of the earthquake. This might seem a matter of chance, but it is more adequately attributed to building construction techniques and consequences of life style. The activities of not only the fire department, but many other organizations would be significantly complicated in the United States where a much greater number of fires could be expected in a similar kind of earthquake. In fact, Japanese researchers looking at the Mexico City earthquake have indicated that they believe the relative absence of fires was one major difference in what they anticipate in a similar kind of earthquake occasion in Japan (Disaster Measures Planning Section, 1986). Put another way, the earthquake in Mexico created a disaster; in the United States and Japan a similar force earthquake could have the potential of being more catastrophic in nature.

The disaster in Mexico City was a major one and, as we have shown, worse in social consequences than appeared on the surface. Nonetheless, the earthquake did not totally disrupt the everyday community behavior of Mexico City in the way that, for example, the Tangshan, the Managua, the Guatemala City earthquakes in recent times, or the San Francisco, Messina or Tokyo earthquakes in the past, completely disrupted the everyday activities of the cities involved. Or as one earthquake specialist said:

> The 1985 earthquake caused a disaster, but not a great disaster. The description great disaster must be reserved for earthquakes that greatly damage cities or cause many tens of thousands of casualties (George Housner quoted in Reinert, 1986: 4).

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The earlier cited cities had catastrophes, Mexico City had a disaster. The earthquake in Armenia in late 1988 on in Iran in June 1990 are better candidates for learning from a catastrophe. Therefore, whatever other lessons we draw from the research results from this study, we ought to keep in mind the scope of the occasion we studied. To say this is neither to diminish the considerable human suffering, physical destruction and social disruption that occurred in Mexico, nor to deny the valuable lessons that can be learned from the research on what happened in Mexico City. It is simply to point out that however geologically similar earthquakes may be, they are not similar in their social consequences.

Studies in Metropolitan Areas

The earthquake we studied occurred in what is the largest urban complex in the world, and in a city which many presently believe will have over 20, 000 000 population by the turn of the century, about a decade off. But in the same time period there will be dozens of other cities which while not having as many residents will nonetheless also become huge metropoleis. Moreover urban scholars have recently been suggesting that along some lines, past differences between metropolitan areas in developed and developing countries are quickly disappearing as global cities emerge (King, 1990). In some respects, therefore, Mexico City and its handling of disasters might be thought of as a research prototype for the future. Put another way, disaster researchers need to consider the urban studies they need to conduct for these social locations of many important disasters in the future. Any realistic assessment has to be that there will be more and worse disasters in the decades ahead (Quarantelli, 1988b).

We think that Mexico City has provided some cues. Disaster researchers should increasingly anticipate that they will have to study very large and very heterogeneous populations. This will pose some methodological challenges, particularly if financial resources for disaster studies do not significantly increase. For in general the larger the study the more costly it will be to undertake.

However, the real issues that need to be addressed will be theoretical and substantive ones which do not emerge when research is done on smaller and less complex social units. How does a researcher conceptualize these vast communities of the future where legal boundaries and governmental jurisdictions will have little functional meaning? Which are the relevant groups that need to be studied regarding preparedness and response when there are multiple organizations within organizations, and multi layers of organized and unorganized groups within the metropoleis of the 21st Century? In both developed (see Quarantelli, 1985c, 1988a) and developing societies (see Schuurman and Van Naersen, 1989) there has been an upsurge in urban areas of locally based movements--environmental action organizations, neighborhood associations, etc., attempting

to improve conditions through self-help schemes; what are the implications of such groupings for urban disaster planning and response? In fact, how will the meaning of disasters and catastrophes in such communities change, given the tremendous resources they already have just for everyday needs and demands? How does one study disasters where the point of impact may be quite distant from points of effects or as Akimoto has written about urban complexes and their lifeline infrastructures:

> the damage inflicted upon the lifelines...is never confined to the affected part. It always has a possibility of being transferred to and extending into one or another function (1987: 174).

These are simply a very few illustrative questions of the many that will need to be raised for improving research into the urban disasters and catastrophes that will occur in coming years.

Cross-Societal Studies

It is rather difficult to easily balance the advantages and disadvantages of cross-societal research on the basis of our study of the Mexico City earthquake. There are both negative and positive implications for future cross-societal studies from the work we did. On the one hand, there are obvious theoretical and practical benefits from this kind of research, especially if done in close collaboration with colleagues from the other country. On the other hand, it is important to note that some of the kinds of difficulties which have been suggested as being likely to appear in such studies (Quarantelli, 1979) did surface.

The close collaboration between the Mexican researchers and the DRC staff was beneficial in many ways (we think for both sides but we will here primarily discuss it from our perspective). For one, our Mexican colleagues provided considerable guidance on the realities of what could or could not be done in the context of Mexican society and Mexico City, as well as identifying relevant officials and the organizations for the study. Their assistance prevented us from having unrealistic research goals and wasting time, effort and resources on unreachable study objectives. This was particularly true in the early stages of the work.

Also, it is very probable that the kind of good social science data we obtained, whether this be in terms of the survey results or the organizational interviews, could not have been collected other than by Mexicans. An earlier DRC study of the chemical explosion just outside Mexico City in 1984, which used only researchers from the United States, did collect data, but the field work encountered all kinds of resistances and much of the information obtained proved highly suspect for analytical purposes.

The collaboration also allowed us to better analyze the data that was in the main collected by our Mexican colleagues. They could and did provide the social context for interpretations that DRC staff members did not have as outsiders to the society. This was accomplished through a number of informal meetings and a somewhat formal briefing.

In contrast, there are also some problematical aspects in collaborative cross-societal research. Such work is costly in terms of time expenditure. Communication whether by phone or mail from one side to another can be very time consuming and not always dependable. Personal contacts may be restricted by cost factors. There are also very likely to be differences in conceptions about social science research which partly reflect different intellectual traditions in the societies from which the researchers come. This may slow down the reaching of consensus on the research design, particularly when one party has primary responsibility for gathering the data and the other the undertaking of the data analysis. Also, there are inevitable and to some extent unresolvable difficulties in the translation of certain questions used in field instruments or in the interpretations of answers obtained. For some words and ideas in one language there are no equivalent meaningful terms in the other language. Even when there is the best of cooperation and good will on both sides, as was true in our study, there are the above issues in cross-societal research which will affect both the quantity and quality of what can be done (see Dynes, 1988).

Certainly, on balance, we think that cross societal studies can both be done and are worthwhile doing (as an example among the few done, see Perry and Hirose, 1983). In our particular case, we feel that we achieved most of our research goals as a result of the collaboration our colleagues in Mexico provided as well as the support we received from a number of Mexican officials. The result was the collection of good data on which many significant and unexpected findings have been generated which have both theoretical and practical implications. In the long run, of course, the evaluation of the research results will have to be left to the judgement of others, but we feel that we have learned much about the social response to the earthquake in Mexico City.

Finally, in conclusion, we want to make a more general point. We think that at the very least we have contributed to a very small data base that will need considerable enlargement if disaster research is going to make any progress. Drabek (1987b) stated this problem in the following way:

> ...if responses are to be generalized, what limits are appropriate? To date we have made minimal progress toward integrating the insights and approaches to comparative structural analysis whereby societies, commun-

> ities, or organizations, for example might be
> compared regarding event responses ...the
> comparative work completed by McLuckie...
> remains relatively isolated within the disaster
> research legacy. Hopefully, that will change
> during the next decade (1987b: 329).

Hopefully, the research we have reported is a start in that
direction, as well as contributing to closing the gap of
understanding between Mexico and the United States that is said to
exist in the quotation that led off this volume.

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Appendix 1.

History of the Study.

As was the case for many in the world, DRC heard of the first earthquake via mass media reports on September 19, 1985. Although none of the Center's projects at that time allowed for cross-societal research, the media stories were monitored as a matter of standard data gathering for an obviously major disaster. Although on site data collection was not possible, DRC began to compile a file of mass media reports on the earthquake.

The involvement of the Center in the earthquake became more direct in two days when Alejandro Garnica Andrade, a research coordinator with the Instituto de Investigacion de la Comunicacion, arrived at DRC. The Instituto is a survey research center associated with TELEVISA, the major private sector television and radio organization in Mexico. The research coordinator had come to DRC to gather information on organizational and individual responses to earthquakes. He remained at DRC for three days and spent many hours talking with the directors and utilizing the Center's library resources. His interest partly stemmed from the fact that the Instituto was considering undertaking a survey on the reactions of the population in Mexico City to the earthquake.

Upon his return to Mexico City, the Instituto undertook a survey of a random sample of the population in the capital city. Using in part some of the ideas obtained in the visit to DRC, data were gathered on a wide variety of earthquake related questions and issues. In particular an effort was made to find out the actual disaster helping behavior of the respondents, how they utilized mass media sources and information, and what citizens thought of the activities of various responding organizations. The sample was stratified with respect to sex and socioeconomic behavior. Since all the field work was completed about three weeks after the earthquake, the study represents one of the very earliest, systematic, and large scale population survey ever done after a major disaster.

Shortly after this first visit from Mexico, DRC was again host to another Mexican visitor. Dr. Julio Cesar Margain of the Secretaria de Gobernacion arrived at the Center and spent four days consulting with one of the directors and using the library facilities. Since the Secretaria de Gobernacion had been given important functions in the post earthquake period, he had been sent to discuss disaster issues with the staff.

Upon his return to Mexico, a Subsecretario de Gobernacion, Fernando Perez Correo, invited one of the DRC directors to come to Mexico City and to consult with the government on post earthquake issues. Russell Dynes went to Mexico and advised the Secretaria on a variety of disaster related matters, including legislation which

established the national system of Civil Protection. In addition, Dynes made contact with numerous high ranking Mexican officials involved in the post earthquake recovery effort.

Early in January, 1986, the possibility of DRC doing actual on site research on the Mexican City earthquake was created when the National Science Foundation (NSF) announced that funding was being made available for study on this specific disaster. The DRC perceived that an important opportunity existed for undertaking something that was very rare in social science disaster research, namely, a cross-societal study involving collaborators from two societies.

A proposal was developed that had two foci. First, it was proposed that DRC examine the response of various disaster relevant organizations during the immediate post impact period.
Research of this nature had been a central focus of DRC studies for over twenty years. Second, the existence of the survey data from the Instituto not only provided a rich vein of information for sociological analysis, but also allowed for the opportunity to replicate and extend the survey one year later, thus adding a longitudinal component to the research effort.

The proposed effort clearly necessitated not only joint or common work with Mexican researchers but also the cooperation of the Mexican government. Therefore in January of 1986, Russell Dynes and Dennis Wenger, two DRC directors, went to Mexico City to discuss the proposed research with various Mexican officials and scholars. A meeting was first held with Juan Carlos Padilla, the newly appointed General Coordinator of the Civil Protection System, the new national level disaster planning organization. He was very helpful and supportive of the proposed research. He suggested a meeting with Professor Jose Luis Reyna, the Director of the Facultad Latinoamericana de Ciencias Sociales (FLACSO) to discuss possible collaboration on the organizational portion of the proposed work. At the meeting in which members of his faculty took part, it was agreed that FLACSO and DRC would undertake a joint research effort focusing upon the response by the Mayor's office and other important organizations in Mexico City in the first two weeks following the earthquake. Furthermore, it was agreed that the research would be truly collaborative, including the joint production of the study design and the field research instruments. It was additionally agreed that the interviews would be conducted in Spanish by representatives of FLACSO, and that DRC would provide some training for the interviewers regarding problems and procedures in doing organizational disaster research. All of the obtained data would be jointly owned and available for analysis by both FLACSO and DRC.

With regard to the public survey portion of the proposed research, the DRC directors met with Dr. Jose Ruben Jara, the Director of the Instituto de Investigacion de la Comunicacion, and Alejandro

Garnica Andrade. Once again, an agreement to collaborate was reached. It was agreed that DRC could have access to the survey data results that had been gathered in the first population survey by the Instituto. In addition, there was an agreement that the Instituto would undertake a second survey, approximately a year after the first one. This second study would reask some of the same questions used in the first survey in order that longitudinal comparisons could be made. Additional questions were however to be added in the second survey, with the survey instruments being jointly designed by DRC and the Instituto. However, the actual data collection would be completed by the staff of the Institute. In this instance too, there was an understanding that the obtained data were to be jointly owned and available for analysis by both DRC and the Instituto.

Upon the return of the directors to the United States, DRC produced a research proposal, discussed it with the Mexican collaborators, and submitted the protocol to NSF. While the proposal was being reviewed by NSF, Juan Carlos Padilla visited the DRC. Having been appointed the general coordinator for the newly created National System of Civil Protection, he came to the Center to consult with the directors regarding general issues of disaster planning and preparedness and specific concerns centering around the alternative structuring of the new organizations. His three day visit was mutually beneficial. He returned to Mexico with substantial material from the DRC library and Center staff members had learned much about certain aspects of Mexican society and disasters in that country.

With the awarding by NSF of the research grant to DRC, actual work on the project began in the summer of 1986. Certain planned collaborative activities were initiated. First, Professor Jose Luis Reyna of FLACSO visited DRC for one week. During this time he presented the Center with valuable information about the structure of the Mexican government and the emergency response pattern. In addition, a draft of the interview guide that would be used with organizational respondents and informants was constructed. Further revisions of the guide were subsequently discussed with FLACSO with Professor Reyna.

Second, Dr. Jose Ruben Jara and Alejandro Garnica Andrade also came to DRC for a week of collaborative work on the survey design. They discussed the first survey undertaken by the Instituto and presented their ideas for both the design and questions that might be used in the follow up study. At the conclusion of the week, the research design and survey instruments were finalized.

Data collection on both portions of the study began in October. Four staff members of DRC went to Mexico City and helped train the Mexican interviewers on DRC field techniques and research operations. This training period lasted for a total of ten days.

Some of the initial interviews were conducted jointly by both DRC staff members and FLACSO personnel.

It is important to note the assistance of Juan Carlos Padilla in the effort. For example, he called a meeting of various Mexican officials whose organizations had been involved in the earthquake response. The representatives of DRC and FLACSO were also present. After a discussion of the proposed organizational research, he requested that the officials present cooperate with the research effort. After that meeting, the interviews with organizational officials began.

Meanwhile, around the first year anniversary of the earthquake, the second survey was carried out as scheduled. The data were compiled, coded, put on computer tapes, and sent to DRC by the end of 1986. Data analysis on this part of the study began in the following months.

For reasons to be discussed in the following appendix, the gathering of the organizational data and its analysis took longer and proved to be more difficult than originally envisioned. A series of additional trips were taken to Mexico City by DRC directors and staff in connection with the organizational portion of the study. A total of four trips were undertaken over the year to collect the interviews that had been finished, to debrief the Mexican interviewers, and to discuss the progress and problems of the project.

Appendix II.

Data Obtained and Used.

With the assistance of our Mexican colleagues, DRC obtained three major sets of primary data. The Instituto de Investigacion de la Comunicacion carried out two population surveys. The first was done with minor DRC input. We did discuss and suggest some of the questions for the second survey. The Instituto after coding the answers to the mostly open ended questions in the surveys, provided DRC with computer ready disks of the completed data sets. Although some analysis of the frequency distribution was done in Mexico, the statistical analyses reported in this volume were done by DRC staff members.

The two population surveys undertaken by the Instituto differed in some respects (see Appendix III for the English language translated copies of both survey instruments). The first survey was conducted during the first week of October 1985 when 567 respondents from the general Mexico City area were contacted. All those interviewed were 16 years of age or older, the sample was stratified with respect to gender, age, and socioeconomic status. (The more technical aspects of how the sample was actually drawn, how weights were assigned, and such technical matters will not be discussed in this volume but will be presented in some of the specialized articles which will be written from other analyses of the data). The sample is statistically representative with a margin of error of three percent. Topics covered in the survey included: how well the government handled a dozen major earthquake related tasks such as search and rescue, the feeding of victims, the sheltering of the homeless, and the providing of information, etc.; usage of the mass media and attitudes about the reporting of the disaster; perceptions and evaluations of the actions of the Mayor's Office, the military, the police, the President of Mexico, and volunteers following the earthquake; disruptions of services and damages to homes as a result of the disaster; what earthquake occasioned problems should have priority for action; and what kind of volunteer work the respondent did in the trans- and post-impact period of the disaster.

Each of the 567 respondents were also treated as informants for certain purposes. They were asked to provide information on earthquake-related activities of every member of their household. THerefore, information was available on the extent and nature of volunteer activity for a total of 2,965 individuals. The usual demographic survey background items were obtained for all respondents.

While the 1986 survey repeated some of the questions asked in 1985, it differed in the following respects. A total of 749 persons, sampled in the same way as indicated for the earlier survey, were interviewed. Topics covered included the following: the longer run

problems brought about by the earthquake; whether the respondent provided and/or obtained housing and sheltering as a result of the disaster, as well as the nature and duration of that kind of assistance; perceptions and attitudes regarding how the government generally and specific agencies (e.g., the police, the telephone company, the Red Cross, the Health Secretariat, the Social Security Institute, the fire department, etc.) had handled earthquake related problems; what had been individually learned from the experience and the knowledge that existed of disaster planning; comparisons of the handling of immediate post impact earthquake problems and later ones; evaluations of earthquake related tasks such as the handling of foreign disaster assistance, the reconstruction of hospitals and schools, the restoration of the water service, the demolishing of damaged buildings and the clearing of debris, the providing of shelters and housing for the victims, etc.; the nature and duration of any volunteering action undertaken; and some of the consequences of the earthquake on pre-existing social problems in the capital, as well as the usual demographic background items.

The two surveys did not present any unusual research problems, especially since the Mexican organization doing the field work was highly experienced in conducting market studies in the metropolitan area of Mexico City. The sampling procedures differed somewhat from what is most familiar to researchers in the United States (for example, a weighing in the samples towards the higher socioeconomic levels of Mexican society), but were logical and quite reasonable for the situations. The coding of certain answers to open ended questions and some of the categories used reflected the Mexican sociocultural scene and were valid within that framework, even though researchers in the United States might at times have proceeded in slightly different ways. On balance, these were minor matters, and we feel rather confident about the quality of the survey data: it is as good as survey data can be for the kind of study that was undertaken.

In addition to the survey data, there were the data obtained by FLACSO. They obtained over three dozen in-depth interviews of organizational officials who played major roles in the disaster response. DRC drafted the initial interview guide, provided field training in Mexico for the Mexican students who actually conducted the interviews, and recommended who should be interviewed in which organization. The Spanish language recorded tapes were translated in the United States under DRC supervision and their analyses were solely done at the Center.

Obtaining the organizational data proved difficult and presented a number of complex problems of sampling and entry that were not easy to resolve. Three difficulties in particular might be noted. For one, there is the very complex and complicated structure that exists in Mexico City. It is the capital city and as such there is a federal or national presence starting at the top with the

President of Mexico. But just as the President of the United States has little to do directly with the governing of Washington, D.C., the President of Mexico while having a more important role in Mexico City, is not involved with the day-to-day operations of the capital city. That is the responsibility of the Mayor's Office.

The Federal District of Mexico City (DDF) and Washington, D.C. are similar in that they are both federal districts. However, the complexity of the former is far more significant than the latter. The Mayor or Regent of Mexico City is appointed by the President of the country. The "Mayor's Office", furthermore, is far more complex than its counterpart term denotes in the United States. For most purposes, the "Mayor's Office" is synonymous with the entire local governmental structure. Under its domain are such varied components as police and fire operations, water, sewer, transportation, communication, health, social security or welfare activities, streets and construction, and civil protection. In addition, the federal district of Mexico City is subdivided into 16 subareas (delegaciones in Spanish). Within there sixteen areas there is considerable autonomy and control of the various metropolitan governmental functions. Therefore, on a normal, daily basis, the structure of local government illustrates the dialectically posed forces of structural concentration and operational decentralization.

In actual fact as we found out in our study, the response of the Mayor's Office to the earthquake indicated even more complexity than the official, formal structure of the organization might indicate. Because the federal government is located within the city, there was overlap of local and federal responses. Furthermore, various other national level organizations such as PEMEX (the national oil company), and many private organizations were also involved in the response. The multiplicity of organized entities operating at different levels presented serious problems for our data gathering efforts.

Given this complexity and our limited resources, we had to restrict our organizational sample to only the very most important of the groups. Therefore, the research design involved starting with core or centrally involved organizations and "snowballing" the sample as information became available about the activities of other organizations.

The second problem we had in obtaining data about organizational activities in the earthquake had to do with the matter of gaining entry and cooperation from relevant organizational officials. Although our joint study with Mexican researchers was very strongly supported from its initiation by high national officials in the Mexican government and some of the key bureaucracies, this did not always provide ready access or cooperation. (This of course is hardly unique to Mexico as DRC can attest from its own

organizational studies in the United States). Although most organizations presented no problems, there were a few that were reluctant to participate in the research even when they were promised anonymity. Data therefore was not obtained from the all the groups that we originally designated for study. Also, in one instance only the top official in a key organization could be interviewed even though it would have been desireable to have obtained information from other officials in the group. In other instances, the originally designated official to be interviewed, usually the head of the organization, designated his deputy as the person to be interviewed; this actually improved the quality of the data because as we have found in research in the United States, such deputies often have more operational knowledge of their groups than does the top official. In general we received data from almost all organizations in which the study had an interest, but the coverage was not complete.

The third problem is the rather familiar one encountered in almost any cross-societal study. The interviews were recorded in Spanish and thus had to be translated into English so they could be analyzed by DRC personnel. (An edited version of the two interview guides used for organizational personnel is presented in an appendix). There were a number of difficulties in the process. It was not easy to find competent translators at least at the hourly rates the Center could afford to pay. The dozen or so translators we used varied rather widely in their skills as we found when we had several interviews independently translated by two different persons. Although we used some Mexican nationals as translators, few of our translators had much prior knowledge of the governmental structure in Mexico City. They therefore sometime missed more subtle points in the comments of some of the interviewees. Finally, it took far more time for a translation to be done well than we had estimated so that not all of the interviews were eventually translated. Because of these translation problems, the quality of the data was not as high as would have been desireable, and there was even a quantitative shortfall.

Our Mexican colleagues were helpful in one particular respect so as to partly counterbalance the problems we have just indicated. They provided a very extensive all day briefing to one of the DRC directors who went to Mexico City, on the general impressions that they themselves had obtained from the interviews they had conducted. The usefulness of the briefing was enhanced by their ability to set their observations within the larger context of their familiarity with Mexican society, the governmental structure, and the earthquake itself.

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Appendix 3.

Field Instruments Used.

1985 SURVEY ON THE MEXICAN EARTHQUAKE

(Original questions in Spanish; rough English translation
provided by the Instituto de Investigacion de la Comunicacion.)

On different aspects and consequences of the earthquake.

1. Thinking of the city's current situation, what do you have
   to say?

2. What rumors have you heard about the earthquake?

3. Of all the people, groups, associations or sectors that have
   been involved in the events after the earthquake, which of
   them in your opinion are those who:

   a. acted more admirably?
      acted less admirably?
   b. acted more responsibly?
      acted less responsibly?
   c. whose participation has been more valuable?
      whose participation has been less valuable?

4. How would you rate the actions taken by the following for
   coping with the situation created by the earthquake:

   a. DDF (the Mayor's office)
   b. army
   c. police
   d. the President (MMH)
   e. volunteers

   For each ask about how appropriate,
                          organized,
                          humanitarian,
                          well time were their actions.

On the public image of the President.

5. Before the earthquake, were you more, the same, or less
   confident in President Miguel de la Madrid (MMH) than now?

6. Do you believe MMH has the situation created by the
   earthquake under control?

7. Do you believe the President is being objectively informed
   on the city's current situation, or do you believe he is
   being given nonobjective or distorted information?

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8. Focusing on the government, how has it handled the following situations: (on a 5-point scale of very well to poorly)

    a. Rescue of survivors?
    b. Inspection of housing damage?
    c. Restoration of services?
    d. Medical aid/care?
    e. Sheltering of homeless?
    f. Feeding of victims?
    g. Order and protection?
    h. Volunteer organizations?
    i. Price control?
    j. Information and direction?
    k. Housing support?
    l. Relocation of public offices and employees?

9. What is your opinion about the information that has been telecast by TELEVISA'S channels? and by IMEVISION'S channels?

    On a 5-point scale indicate:

    a. Very complete---very incomplete.
    b. Very sensational---very realistic.
    c. Very directive---very nondirective.

10. Would you want to be more fully informed on the consequences of the earthquake, or would you rather hear less about them?

11. Identify the consequences of the earthquake that in your opinion the government should attack immediately.

12. Identify the consequences of the earthquake about which you would like to have more information about.

13. Did the earthquake(s) cause any damage to your house?
    a. No damage.
    b. Slight damage (cracks, broken objects)
    c. Considerable damage but the house is liveable
    d. Severe damage making the house uninhabitable
    e. Other

14. Was anyone living in this house injured?

    If yes, how many?
    What kinds of injuries were suffered?

15. This week, has your house regularly had the service of:

    a. electricity?
    b. water?   (indicate if this facility does
    c. telephone?   not exist in the house)

16. Were you informed about the earthquake by the mass media?

    a. The day of the earthquake:
       How many hours did you hear, read, or watch TV, radio, or newspaper?

       What radio station(s), TV channel(s) or newspaper(s) did you use?

       Which radio station(s), TV channel(s) or newspaper(s) provided the best information?

    b. After the day of the earthquake:

       What radio station(s), TV channel(s) or newspaper(s) did you use?
       Which radio station(s), TV channel(s), or newspaper(s) provided the best information?

17. Have you changed any future plans because of the earthquake? If yes, ask for details.

(The interviewer was asked to list all the persons---relatives or not---who lived in the house and obtain the following information).

a. **Names**
b. **Age**
c. **Sex**
d. Who is the housewife?
e. WHo is the head of the family?
f. Who was a volunteer helper with respect to the earthquake?
g. How many day(s) did he or she help?
h. How many hours were worked (average per day)?
i. What kind of specific help did he or she provide?

1986 SURVEY ON THE MEXICAN EARTHQUAKE

*Means questions was included in the 1985 survey.

I. Background data on respondent:*

   Sex
   Age
   Age category
   Socioeconomic level
   Marital status
   Educational category
   Occupation
   Appliances and services available in the house

II. Questionnaire

1. What do you think about the situation brought about by last
year's earthquake?

2. Of all the people and organizations that were involved in the
   events following the earthquake, who performed well, who else?

3. And who acted badly, who else?

4. * Do you believe the President is being objectively informed
 on the work being done to deal with the problems brought
about by the earthquake, or is he being given nonobjective or
incorrect information?

5. * Would you want to have more information about the
consequences of last year's earthquake, or would you rather
   not?

   If yes, go to Question #6
   If no, why not?

6. * What would you like to have more information about?

7. * In your opinion, did the government have the situation under
   control in the weeks that followed the earthquake?

   a. total control
   b. only partly under control (if so, what aspects?)
   c. no control at all
   d. don't know

8. Does the government have the situation under control now?
   (same a, b, c, or d)

9. * Identify the problems brought about by the earthquake that
   in your opinion must be solved as soon as possible.

10. Besides casualties, victims and collapsed buildings, what others of the city's current problems do you think are the result of the earthquake?

11. * Do you think the earthquake worsened some problems the city already had?

    If yes, what problems?

12. * How would you rate the actions taken by the following persons or groups in responding to the earthquake?

    DDF (The Mayor's Office)
    Army
    Police
    Telefonos De Mexico
    The Red Cross
    The fire department
    The President
    The IMSS (Social Security Institute)
    Volunteers (individual people)
    The Health Secretariat
    The mass media
    Providers of foreign aid?

13. For each of the above, are they now better organized, the same, or less organized to cope with another natural disaster in the city?

14. Looking at the government, how has it handled each of the following situations caused by last year's earthquake?

    (Rate as very well, well, average, poor, very poorly)

    a. Inspection of houses for safety.
    b. Restoring of telephone service.
    c. Providing of shelters for the homeless.
    d. Demolishing buildings and clearing debris.
    e. Passing of laws to increase the earthquake resistance of buildings.
    f. Moving government offices out of the city.
    g. Honestly administering the NAFINSA donations account.
    h. Improving and embellishing the city.
    i. Honestly handling foreign aid.
    j. Restoring damaged streets.
    k. Providing housing for the victims.
    l. Publically recognizing heroic acts.
    m. Reconstructing hospitals and schools.
    n. Informing the public on how things are going.
    o. Restoring water service.

15. Some aspects of city life are now going to be mentioned. Tell me if you believe the earthquake has anything to do with how they are now.

    a. The economic crisis. If yes, increased or decreased it?
    b. Trust in other citizens. If yes, increased or decreased it?
    c. People's desire to live outside of the city. If yes, increased or decreased it?
    d. Security on the streets. If yes, better or worse?
    e. People's confidence in the government. If yes, increased or decreased it?
    f. Love for the city. If yes, increased or decreased it?
    g. The desire to make an extra effort and pull through. If yes, increased or decreased it?

16. Since the first two weeks after the earthquake, have you participated in one way or another in helping with problems brought about by the earthquake?

    If yes, doing what?
    a. Donating money
    b. Helping victims
    c. Aiding in reconstruction
    d. Other (what?)

    If no, why not?

17. Would you be willing to participate in evacuation drills at your work place or school?

    If no, why not?

18. WHo should organize disaster preparation and rehearsals? The government, companies, or someone else?

19. Do you know of a government plan for a disaster?

    If yes, what is that plan?

20. Have you heard about the National System for Civil Protection?

    If yes, do you know what it is?

21. Have you made plans for you and your family in case of another earthquake?

    If yes, what kinds of plans?
    If no, why not?

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22. Should another disaster happen, have you and your family already agreed on going to the safest part of the house?

23. Do you already have a first aid kit?

24. Do you already know what to do with children and/or the elderly?

25. Do you already have an agreed upon meeting place if you are apart when a disaster occurs?

26. Do you already know emergency numbers you can call if needed?

27. Do you already have such things as batteries, flashlights, pure water, etc.?

28. Do you already know the safest way to evacuate your house?

29. After the earthquake last year, did you consider moving out of the city?

   If yes, why did you not move?

30. After the earthquake, did you change your place of work?

31. Did you move out of your house?

32. Did you cancel an already planned trip?

33. In your opinion, has the distribution of new houses for the homeless been just?

   a. It has been just.
   b. It has been partly just and partly unjust.
   c. It has been unjust.
   d. Don't know.

34. * Because of the earthquake, have you had this year problems in your house with:

   a. electricity?   (indicate if there is no
   b. water?   installation of the service)
   c. telephone?
   d. mail?

   For each, what kind of problem?

   a. interruptions
   b. billing troubles
   c. cut offs
   d. other (what?)

35. * Because of the earthquake, was anyone living in this house hurt?

    If yes, how many were hurt or injured?
    If yes, what kind of injury was suffered?

36. After the earthquake, did you and your family stay in your house or did you go and live with relatives or friends?

37. To whom did the house where you lived in belong to?

38. Why did you look for shelter there?

39. How long did you live in that house?

40. (For those that did not move elsewhere)
    Did some relatives or friends come to live in your house after the earthquake?

41. Why did they come to your house?

42. How long did they live in your house?

43. Please tell me if you:

    a. Sometime feel tremors?
    b. Are concerned about the safety of your relatives and and friends?
    c. Are nervous to go to a theater or movie house because an earthquake might occur?
    d. Get along better with your family than before the earthquake?
    e. Watch the lights to see if they are moving?
    f. Feel more responsible to help your neighbors?
    g. Are nervous to be in a tall building?
    h. Are disposed to help other victims of some disaster?

44. *Finally, would you tell me if you live in a:

    a. Rented apartment?
    b. Rented house?
    c. House you own?
    d. Condominium you are still paying for?
    e. Condominium you own?

ORGANIZATIONAL INTERVIEW GUIDE

(This is an edited and translated version of the 19 page guide that was actually used. To save space, most of the instructions provided, many of the probes suggested, and some of the less important questions that were in the actual guide used in the field have been left out of this edited version).

Instruction for interviewers:

As was pointed out in the training sessions, this is NOT an interview schedule but an interview guide. The questions given need not necessarily be asked exactly the way they are phrased or in the order given. The important point is that the questions indicate the major topics regarding which we want to obtain information. It is very important that enough detail be obtained so the probing procedures discussed in the training sessions should be carefully followed).

The guide has two parts:
Part #1 is to be used with all organizations except the Mayor's Office.
Part #2 is to be used with the Mayor's Office (as well as certain questions from Part #1).

The prime focus is on the efforts to coordinate the city's response. We are interested in obtaining information on what each organization did in the trans- and the post- impact periods of the earthquake. We are also concerned with getting a picture of the interactions that the different organizations had with one another.

A secondary focus is on organizational planning and preparedness for disasters, especially earthquakes. The questions in the last half of both Parts #1 and #2 are designed to obtain such information.

Part #1

The initial questions in this guide are aimed at obtaining:
(a) a time ordered sequence picture of the tasks undertaken by the organization;
(b) the perception of the legitimacy, responsibility, and authority the organization had of the tasks undertaken; and
(c) the degree of perceived conflict and/or coordination in the overall organizational response to the earthquake.

I would like to ask some questions about the response of your organization to the earthquake. Perhaps we can go back to when your organization first heard about the earthquake and go step by step through what was done the first several weeks.

1. When and how did your organization first become aware of the earthquake?

2. At what point did the organization become involved?
   In what way?

3. What tasks did your organization undertake?
   (Probe: establish the order in which they occurred,
           the timing and duration of each of the tasks,
           what organizations if any undertook the same tasks,
       and, why did the organization think it had to
           do these tasks?)

4. What problems developed in trying to accomplish the tasks?

5. You mentioned a number of tasks your organization undertook
   after the earthquake.
   Which were the more important ones?
   (Probe: most and least important, relative importance)

6. Let us now turn to a related matter.
   Would you look a this card (hand to respondent)
   Tell me if you know which organization did this task during
   the emergency time period of the disaster. There may be more
   than one organization involved.
   For example, which organization was involved in:

   a. search and rescue activities?
   b. activating an emergency operations center?
   c. requesting emergency relevant resources from
      other groups?
   d. coordinating search and rescue activities?
   e. providing emergency medical care?
   f. setting up security measures (e.g., pass system,
      roadblocks, etc.)?
   g. making damage assessments?
   h. opening shelters for victims of the earthquake?
   i. releasing information to the mass media?
   j. transporting the injured?
   k. handling the dead?
   l. compiling lists of missing persons?
   m. establishing, if any, on-site command posts?
   n. providing food for victims?
   o. declaring that the emergency period was over?
   p. restoring essential services?
   q. coordinating relief supplies for victims?

   (Probe if there were any other important emergency time tasks
   which were carried out that are not the list; if any, what
   were they, and who did them?)

7. How was the response coordinated?

8. Who coordinated it?

9. Was there any changes in the coordination over time?

Let us now turn to other than local organizations.

10. Was there any involvement of organizations from the federal or national level?

11. What did they do?

12. How did they interact with local organizations or groups?

13. Were there any conflicts between or among the different groups from the local and the national levels?

We want now to look more specifically at the kinds of problems that had to be dealt with by your organization.

(Start with the problems or difficulties that the respondent may have already mentioned).

14. Were there any problems of a technical nature?
    (Probe regarding resources, information, and expertise)

15. Were there any intra/interorganizational problems or difficulties?
    (Probe regarding coordination,
                    communication,
                    authority,
                    legitimacy,
                    domain, and
                    boundaries).

Would you look at this list (hand respondent card).
Tell me what you can about these matters as they came up in the disaster response:

a. damage assessment?
b. special problems of search and rescue in an urban setting?
c. decision making given the absence of relevant information?
d. expectations as to how people would behave?
e. mobilizing resources?
f. coordination of public and private groups?
g. dealing with different levels of government authority?
h. the involvement of international organizations?
i. the operations of the mass media?
j. the convergence of information, goods, and persons?
k. integrating volunteers into the response?

16. What are the things you feel that your organization did particularly well?

17. What advice would you give to others who might be faced with the same situation that you had?

18. In looking back at your experience, are there any alternatives to the actions you actually took?

We now want to get away from what your organization did in the earthquake and look at any prior planning for disasters.
(If at all possible, lead into by making a link to any previous mention of disaster preparedness by the organization).

19. Setting aside what actually happened after the earthquake, what in your estimation was the state of overall disaster planning in Mexico City?

   (Probe how well prepared the community as a whole was, and the respondent's relative assessment of the situation).

20. Generally speaking, was there any overall disaster planning among the emergency organizations in this city?

   (Probe what the planning involved, which organizations participated in the planning, and if any group took the lead.)

21. Which local organizations, if any, has been the most important in the overall disaster planning in this community?

Let us turn now to the role of the city in the disaster planning.

22. Do you know if the city:

   a. had a written disaster plan?
   b. conducted rehearsals and exercises of the plan?
   c. made risk assessments?
   d. had an emergency operations center?
   e. made attempts to educate the general public about disasters and planning for them?
   f. conducted disaster training programs?
   g. linked up key emergency groups?
   h. held informal meetings to exchange disaster planning information?
   i. had mutual aid agreements?
   j. helped organizations in drawing up their disaster plans?

23. What about your own organization's contact with the city prior to the earthquake?

Did you have any contact with respect to disaster planning?

(Probe nature and frequency of contacts, assessment of whatever assistance was received).

24. Now as to your own organization, prior to the earthquake, did it:

    a. have a written disaster plan?
       (If so, obtain a copy of the plan)
       (Probe when plan was last updated)

    b. carry out rehearsals and exercises of the plan?

    c. special facilities for disaster operations (such as a permanent command post or a mobile van)?

    d. personnel assigned to planning specifically for disasters? (Probe who, what they did)

25. In addition, prior to the earthquake, did your organization:

    a. do risk assessment?
    b. educate the general public about disasters and planning for them?
    c. conduct disaster training programs?
    d. establish informal links with other emergency groups?
    e. have mutual aid agreements?
    f. help other organizations draw up their disaster plans?

In conclusion, let us talk about the past experience of your organization with disasters (in addition to the last earthquake).

26. What disasters have you experienced?

27. If you had disaster planning at that time, how well did the planning work?

Finally, to conclude:

28. Is there anything you would do differently in the future in the case of another disaster?

Thank respondent for giving the interview.
Obtain whatever relevant documents are available.
Indicate that organizations might be contacted again for more information in the future.

Part #2.

Instruction for interviewers:

This guide is to be used with officials from the Mayor's Office. Its purpose is to obtain information about the internal structure and functions of the office, the social links it has with other disaster relevant organizations, the emergency resources it has available, the kinds of preparedness activities undertaken prior to the earthquake, and what prior disaster experiences the office had).

TO OBTAIN INFORMATION ABOUT THE RESPONSE OF THE MAYOR'S OFFICE IN THE EARTHQUAKE USE QUESTIONS #1-18 FROM PART #1.

Internal structure and functions:

1. What is the legal jurisdiction of the Mayor's Office?

2. What is the table of organization of the office?
   (see if a copy of the table of organization can be obtained)

3. What is the division of labor in the office?

4. To whom is the office responsible?

   (Probe lines of authority and budget involved)

5. What are the major goals or objectives of the office?

Resources:

Let us turn to the disaster planning you have.

6. Is there a written disaster plan?

   (Probe if there was one before the earthquake, the time it was last revised, if the plans have ever been rehearsed or exercised, and when)

7. Did other organizations help to develop the plan?

8. What changes, if any, have occurred in the plan over the last five years?

9. Did the earthquake have any effect on disaster planning in the office?

10. What kind of emergency facilities are available?

11. What kind of emergency equipment is available?

12. Is there any stockpiling of emergency resources?

Let us now look at other aspects of disaster planning.

13. Prior to the earthquake, did the office:

    a. do risk assessment?
    b. attempt to educate the public about disasters and planning for them?
    c. conduct disaster training programs?
    d. maintain informal links with other key emergency groups?
    e. hold formal meetings to exchange disaster planning information?
    f. have mutual aid agreements with anyone?
    g. help other organizations draw up their disaster plans?

    (Probe for all of the above on who has responsibility for the activity, what changes if any occurred as a result of the earthquake, and who was responsible for the change.)

14. What kinds of emergencies have occurred in Mexico City in the last five years?

15. What was the involvement of the Mayor's Office in any of them?

Thank respondent.
Obtain relevant documents.
Indicate that organization might be approach later for additional information.