## DISASTER RESEARCH CENTER THE OHIO STATE UNIVERSITY COLUMBUS, OHIO 43201

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# A MODEL OF COMMUNITY COORDINATION

## IN RESPONSE TO DISASTERS

by

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This paper incorporates contributions from numerous other members of the DRC staff. Thomas R. Forrest, John R. Brouillette, and David Adams were particularly responsible for the refinement and clarification of many ideas in this paper. Also our general approach and many points in the paper are found in other DRC publications. Since these points have not been cited, we acknowledge them in general. We are especially indebted to Russell Dynes, Organized Behavior in Disaster (Lexington, Mass.: D. C. Heath, 1970).

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## Introduction

The Disaster Research Center is presently engaged in studies of community coordination during natural disasters. The purpose of this report is to present with appropriate illustrations from field research, a conceptual model of the development of community coordination under stress conditions. We are attempting to address some of the following questions in this report. How are community organizations integrated to meet the problems posed by natural disasters? What factors, either directly or indirectly affect interorganizational response? What are the consequences of the community's organized emergency response?

The focus of our analysis then is community emergency organization structure during natural disasters and the basis for it. Interorganizational relationships is an element within the framework of organization action. The activity of any organization is embedded in an environment of other organizations as well as in the context of the community at large. During emergencies, interorganizational relationships become increasingly evident because the nature of the tasks created by the disaster event requires intense activity on the part of many different organizations. These relationships, of course, have important implications for the total community's response to the disaster event.

We have selected as the dependent variable of the analysis, interorganizational relationships, or stated in another way, the community's organized response to disaster. The first section of the report will delineate various aspects of interorganizational relationships. The typologies developed serve to explicate the variable in detail. The community as an ecological and social unit is labeled as the contextual variable and will be discussed in section II of the report. Section III discusses the disaster event as the intervening variable of our perspective. This variable has significance both as an agent and in temporally dividing the community in terms of pre and post impact (t1 and t2). The existent organizations within the community are labeled as the independent variable under consideration because they represent inputs for interorganizational relationships. This variable is discussed in section IV of the report within the framework of organizational action. The intricate and reciprocal relationship between interorganizational relationships and organizational action will be explicated in some detail to provide closure to our perspective. Section V will briefly consider the implications of interorganizational behavior for the effectiveness of community emergency response. A concluding appendix contains an analysis of methodological techniques employed in the analysis.

The perspective we have developed can be represented schematically by figure 1.

Figure 1: Community Emergency Response



## Interorganizational Relationships: The Community's Organized Response as Dependent Variable

For our purposes, the community is viewed as a semi-autonomous yet open system composed of organizations as its component parts. In other words, the community has a place in time and space, can be identified on maps, can be located by longitude and latitude, etc. Community used in this sense refers to towns and cities. Within this delimited geographic area, all organizations, large or small, public or private, existing or emergent, make up the organized structure of the community. As such they represent the major resource holding, allocating, and receiving units for coping with problems posed by natural disasters. By watching the system as it adapts to natural disasters, we gain understanding, not only of the distributions of organizations and their relationships, but also the processes by which resources are allocated and integrated. Natural disasters are particularly revealing for they tend to highlight allocation and integration processes that may go unnoticed in communities under more normal conditions. In emergencies, organizations are often confronted with a scarcity of resources which makes attainment of organizational objectives more difficult. Few, if any organizations have unlimited access to needed resources. Hence, it becomes necessary for organizations to interact and coordinate their activities with other organizations. In order to understand the nature and function of relationships between organizations, attention should be focused upon the processes linking organizations during normal as well as during emergency periods. Cues to the nature of this process may be found in the general processes which characterize the functioning of discrete organizations.

In the broadest sense, these relationships may be characterized as being of two main types. The first of these may be called coordinating and is conceptually associated with the processes related to decision making, the passing of instructions through the chain of command, and defining of organizational divisions of labor. The existence of a command headquarters with top echelon from several organizations is a good example of coordinating interorganizational relationships. For example, during the Minot flood of 1969, the activities of federal, state, and local governmental agencies were coordinated at the flood control headquarters. Among those at the command post were representatives of the National Guard, U.S. Corps of Engineers, city auditor, city manager, chief of police, city engineer, county C.D. director, disaster chairman for the county Red Cross and others. The second of these relationships may be called facilitating<sup>2</sup>. Through this type of relationship one organization supplies needed information, instructions, material, and personnel as means to the achievement of another organization's goals. The relationship between fire departments and departments of public works is an excellent illustration. Fire departments depend on the maintenance of the city's water supplies. Generally, a division of the department of public works is responsible for the distribution of water, thus prompting a facilitating relationship. Also a close relationship exists between police departments and the department of public works. One of the most time consuming tasks of modern police forces is traffic regulation. When emergency problems arise, the police turn to the department of public works for assistance. Thus the processes of facilitating and coordinating refer to respectively, policy and operations.

At the highest level of abstraction, coordinating and facilitating relationships can be viewed as communicative or exchange relationships. Thus, coordinating relationships principally involve the exchange of information or instructions. Facilitating relationships involve the exchange of not only information, but also material, personnel and services. From this perspective, the links between the units involved in both types of relationships can be seen as media or channels of one kind or another through which whatever is exchanged passes. In fact, a particular organizational relationship may be mediating in the sense of providing the necessary media for interorganizational exchange. For example, we have found in our research of natural disasters that often citizen's band and ham operators clubs (radio) operate in a mediating capacity. The mass media also develop these types of relationships though they are only one aspect of their involvement in emergency situations. Thus to our two main types of interorganizational relationships we will add a third, that of mediating relationships.

Community interorganizational relationships can be conceptually illustrated by figure 2.

Figure 2: General Types of Relationships

COORDINATING MEDIA (mediating FACILITATING

This figure suggests that the policy making and operational processes within a community of organizations are linked to each other through exchange via coordinating and facilitating relationships.

Conceptually, then, three levels of analysis have been suggested: (1) the characterization of interorganizational relationships as communicative or exchange relationships; (2) the division of these relationships into two main sub-types, coordinating and facilitating, and a third, mediating; (3) the categorization of the items which may be exchanged or communicated through the various media which link the organizational units as (a) information (including authoritative instructions), (b) personnel, (c) material, (d) services.

It is necessary to point out that these processes can be described within as well as between organizations. For example, organizations like the police department are internally involved with coordinating and facilitating, many possess the media, and may exchange all of the items listed above. On the other hand, organizations like the mayor's office or CD may specialize in coordinating relationships vis-a-vis other community organizations but engage in very few facilitating relationships.

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## The Disaster Problems

The new or altered environment created by the impact of disaster constitutes a series of problems which the organizational elements of the community must solve. These problems can be considered in terms of the following task areas:

- 1. <u>Warning</u>. The process of detecting and predicting the occurence of a disaster agent, disseminating this information and/or information on ameliorative or protestive action to the public and community organizations, and receiving such information from other organizations prior to impact.
- 2. <u>Pre-impact Activity</u>. (post warning but prior to impact) This entails the continuing search for information regarding the disaster agent, readying of material resources, institutions of preventive measures to lessen impact and consequences of the agent.
- 3. <u>Search and Rescue</u>. This requires the location, extrication and transportation of entrapped persons as well as providing search and rescue equipment.
- 4. <u>Care of Casualties</u>. Included here is medical aid for the injured and caring for the dead.
- 5. <u>Restoration of Essential Services</u>. This concerns temporarily returning to service: gas, electricity, telephone, water, transportation, etc.
- 6. <u>Welfare</u>. Providing food, clothes, and housing for disaster victims and disaster workers are included here.
- 7. <u>Community Order</u>. This involves guarding property, patrolling danger areas and directing traffic near the impact area. It includes seeing that community resources, both private and public are used for common community ends.

Thus interorganizational relationships are linked with attempts on the part of community organizations to meet these task areas or problems thereby, mitigating environmental impact. On the basis of types of relationships and problem areas, we can cross-classify interorganizational relationships as shown in figure 3.

A few illustrations are now in order. A good example of a warningmediating relationship would be the interaction between weather bureaus and relevant disaster organizations such as the police and fire, civil defense agencies, public utilities, mass media, etc. The warning system that was in operation during the Topeka tornado of 1965 is a case in point. A statewide weather bureau teletype system, including the weather station at the Topeka airport was monitored by local radio and television stations, the city police department, the county sheriff's office, and the local post of the state highway patrol. The local weather bureau supplemented this with a calling list. Notified by the bureau over normal telephone lines were 9 radio stations

## Figure 3: A Cross-Classification of Interorganizational Relationships

Coordinating

Facilitating

Mediating

Warning

Pre-Impact Activity

Search and Rescue

Care of Casualties

Restoration of minimum Services

Welfare

Community Order

outside of Topeka which did not have weather teletype monitors; the superintendent of schools, notified both as a precautionary measure and in the preparation of schools for possible use as evacuation centers; a local citizen's band radio organization and a local ham radio operator's club. Further, under the direction of the local civil defense, a network of communications was in operation to insure that all governmental agencies were aware of weather conditions reported by the weather bureau.

The relationship between the Red Cross and local hospitals is an example of a facilitating relationship in the area of caring for casualties. The Red Cross is often involved in supplying needed blood to hospitals during emergencies. By way of illustration, during the Oaklawn tornadoes of 1967, this facilitating relationship was of some importance to emergency operations in two hospitals in particular and in several others.

An excellent illustration of coordinating relationships specific to several of the disaster task areas is that which occurred following the Alaskan earthquake of 1964. The mayor, city C.D. director, policemen, firemen, and numerous volunteers gathered at the Anchorage Public Safety Building, (PSB). Throughout the evening, measures began to emerge to control the convergence of volunteers and those seeking information. Internal divisions of responsibility began to emerge. Information was exchanged and consolidated. Gaps of information were delineated and volunteers were recruited to be in charge of filling them. Important liaisons were established with military representatives from Elmendorf, Richardson, and the Alaskan National Guard. These liaisons were implemented so that the military became the major source of needed equipment and organized manpower. This pattern, established early in the evening, became the typical mode of community response. Requests or needs would be reported to the PSB or were anticipated by those working there. Then, through the city CD, they were passed to the Alaskan Command Center at Elmendorf and fulfilled by the military. The division of labor within the community response was elaborated and crystallized at a 3:00 a.m. meeting held at the basement of the PSB. Attended by city, state, and military representatives, it was an occasion for status reports, discussions of courses of action, and achieving liaison among current organized activities.

It may be further suggested that a certain division of labor may exist among the organizations in a community with respect to various disaster problems. This division may be explicit in the form of a community disaster plan or it may be implicit in **terms** of organizations charters and formal statements of purpose. Clusters of organizations may exist or emerge, therefore, as "organization sets"<sup>4</sup> or "task environments" around a given disaster problem. In other words, organizations charged with similar responsibilities may interact in terms of coordinating, facilitating or mediating relationships more frequently than they interact with organizations involved in other disaster problems. These clusters can be thought of as subsystems within the larger community of organizations.

For example, certain community organizations are more involved in the warning phase than others. In general, the weather bureau, public health services, state and local agencies, fire department, radio and television stations are more directly involved in warning. Certainly, warnings can also be initiated and disseminated by various groups, agencies and individuals in the community, but the complexity of the process and the technology necessary to accomplish these tasks inevitably mean that organizations with collective skills and pooled resources bear the major responsibility for such activity. Another example of subsets of organizations involved in disaster task areas is that of community order. It is usually established organizations which cope with the problem of community order during a disaster. Regular law enforcement agencies such as the local police department, sheriff's office and state patrol as well as the military deal with such problems as the control of convergence and the establishment of security within the impacted community. This is true of very localized disasters, such as the Indianapolis explosion in 1963, as well as very diffuse disasters, such as Hurricane Beulah which struck Texas in 1967.

## Location of Organizational Interrelationships

The actual identification and delineation of these subsets of organizations is an important goal of research. Task or problem areas provide a criterion for classification of these subsystems. It may also be useful to categorize varieties of interrelationships with respect to the location of the organizations involved, i.e. the location of the organization either within or outside the community sytem as we have geographically defined it. Thus the national guard would be an extra-systematic unit in any subset of organizations (assuming its normal headquarters is outside the territorial limits of the community). The relationship between the local chapter of the Red Cross and its national headquarters would be categorized in like fashion. This additional distinction is necessary because of the growing interdependence of local communities. Political jurisdiction of extra-community agencies often extend in some fashion into the specific local community, state, or region. In addition, certain disasters may be sufficiently destructive of local resources to necessitate the intervention of non-local agencies who assume an important role in disaster response.

It it necessary to note that in some cases, such as state capitals, the location of regional and national headquarters in close proximity to the emergency may have important implications for the community's response to disaster even though their connection to the local community may be normally quite minimal. However, the fact that these organizations have locality relevance during any emergency is argument enough for their inclusion as a systemic component. The geographic delimitation is admittedly arbitrary, but it defines quite well the set of possible organizations for analysis. Finally, in this regard, where the location of these regional and national offices is becomes important in any evaluation of effectiveness of community response. The specification of this factor, though important, poses no real problem.

The Structural Consequences of Interorganizational Relationships

Organizations wary in the extent to which they become involved in relationships of any kind with other organizations. Often police and fire departments provide within their own organization the units necessary for both coordinating and facilitating and are responsible for tasks of a specific type, especially the type which cannot be performed by untrained personnel nor facilitated by equipment readily available from other local organizations. On the other hand, the Red Cross is responsible for more diffuse tasks. This diffuseness, together with an organizational structure that undergoes important changes after the impact of the disaster agent, frequently requires that the organization turn to other groups for assistance. The voluntary nature of the organization also makes the Red Cross much more open to assistance from volunteers than would be the case with police and fire departments.

This condition points to the fact that interorganizational relationships have certain structural consequences for those organizations involved.<sup>5</sup> Basically the consequences represent the degree of control or power an organization maintains over its operations. The following typology delineates the possible structural consequences.<sup>6</sup> 1. <u>Autonomy</u>. Each organizational unit remains independent. This represents the basic condition of little or no interaction or interdependence, mutually exclusive domains, etc.

2. <u>Contracting</u>. The organizational units set the limits of the cooperation but remain otherwise independent. An excellent illustration here was the development of a community-wide mutual aid plan in New Orleans after Hurricane Betsy. Since the New Orleans police department was called upon to secure needed security equipment such as boats, cranes, bulldozers, buses, etc. for a large number of other organizations in New Orleans, they prepared and activated a master mutual aid agreement with a large number of emergency and industrial organizations in the New Orleans area. Under the provisions of the pact, the police department is able to call upon other organizations for equipment and skilled personnel during times of crisis. These mutual aid agreements have been institutionalized in the form of an organization which elects officers and which meets regularly. One of the purposes of the organization is to keep a current status report of all emergency equipment available throughout the city. Therefore, arrangements such as these represent mutually contracted obligations.

3. <u>Coalescing</u>. Elements of the organizations merge to coordinate, facilitate, mediate, or all three. The Jonesboro tornado of 1968 serves as a good illustration. For the first five hours after impact, communications among organizations consisted of passing information rather than instructions or requests. By 3:00 a.m. several protective organizations and city and county officials had begun to develop a quasi-emergency operating center. Organizations represented at this center included the National Guard, the sheriff's office, the state highway patrol, the city police, mayor, and the county judge. Each emergency organization involved set up their own radioequipped vehicles just outside the police station which became the EOC. Although direct emergency communication among all organizations was not possible, they were physically close enough to each other for runners to pass information, requests, and instructions among them. For the next 24 hours, the EOC coordinated secondary evacuation, security, and search and rescue activity.

4. <u>Coopting</u>. An element or elements of one organization is/are absorbed by another organization. The St. Paul flood of 1965 presents an appropriate example here. During this particular emergency, the head of the public works department (PWD) was given full authority by the city to cope with the flood. With this authority, the PWD placed a unit of civil defense in charge of public information. In effect, this unit became an arm of the PWD.

As can be seen, each of the above represents a different power and/or authority relationship between the organizations involved. In some cases authority interrelations become clearly specified; in others it may remain ambiguous.

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With the typologies developed, we feel that the important problems of identification and specification of interorganizational relationships can be handled. With task or problem area, we can identify interorganizational relationhips by function in terms of subsets of organizational activity. With structural consequences we can more clearly specify the type of arrangement existing between various organizations for any given situation. Our general focus at the outset upon the process of organizational interaction (coordinating, facilitating, and mediating) is a necessary step in explaining the total community's response to the emergency. By aggregating our data on these basic processes, we can go beyond the organizational level to the community level thus incorporating a wider range of behavior and comcomitantly a more adequate understanding of emergency response.

#### The Community as a Contextual Variable

Previous literature on disasters and data gathered by the DRC suggest that three major factors affect the community's organizational response. These are characteristics of the community, the organizations having relevance to the community , and the disaster agent (threat as well as impact). The following community characteristics are considered to be important for the explanation of the community's response to disaster. Some of them are clearly community level factors, while others seem to be aggregated from organizational data. However, even though data may be gathered at the organizational level, it is listed here to indicate the desirability of aggregating it as a community level factor.

# A. Demographic and ecological variables

- 1. Community population
- 2. Geographic area
  - a. size
    - b. section of the country
    - c. topography
- 3. Socioeconomic distribution
- B. Organized community structure
  - 1. Type of government (mayor, city manager)
  - 2. Formal authority structure as depicted by:
    - a. City organizational chart
    - b. Nature of agreements, contracts, etc.
  - 3. Organizational profile
    - a. Number and names of organizations
    - b. Distinction between public, municipal and private etc.
  - 4. Organizational sets and focal organizations
    - a. Number and kinds of distinct sets and focal organizations
    - b. Degree of overlap in sets and at what level

- Power, prestige, legitimation, and autonomy of various c. organization sets and focal organizations
- Degree of interorganizational integration and at what d. levels
- Institutional constraints (property, contract, authority) e.
- C. Disaster experience

1.

- Frequency of disasters in the community or nearby a.
  - types
- Ъ. similarities in consequences
- 2. Disaster subcultures

#### Community preparedness D.

- 1. Plans
- 2. Resources (Human and physical)
- E. Normal communication structure and resources
  - 1. patterns
  - 2. equipment

## F. Extra-community ties (not part of disaster plan)

- 1. Ties to other governmental units
- 2. Degree to which ties are formalized
- 3. Occasions on which extra-community ties are activated

Most of the above factors are relatively concrete and require no further explanation as to their relevance for community emergency response. Only a few additional comments need be made here. What we have called the organized community structure is an elaboration of organizational patterns in a commu-The determination of organizational sets requires a great deal of innity. tensive investigation of interorganizational relationships. Sources for this information are discussed in the appendix. The type of structure existent within a community has important implications for organizational capabilities during disasters. For example, existent organizational linkages may expedite organizational communication and coordination considerably because the media for exchange are already operative. Secondly, disaster experience is of course an important factor in community response. Subsumed here is the notion of disaster subculture. Certain events may represent a disaster for one community but for another merely signify an emergency which does not threaten vital community functions. Many communities as a part of their cultural development have evolved certain arrangements which prepare them for emergencies, thus mitigating the effect of the agent. Such disaster subcultures seemingly emerge in communities with considerable experience in repetitive emergency situations. Evidence of disaster subcultures is most clearly seen in certain sections of Texas, Louisiana, and Florida, which often experience hurricanes, and areas of midwest subject to tornados.

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The purpose of these factors is to give a total picture of the community as we have defined it. They are essential for the explanation of community response and provide an excellent medium for comparative analysis as well. Without this contextual material, we run the risk of developing unwarranted conclusions.

## The Disaster Event as Intervening or Test Factor

Test factor is used here to indicate a concrete empirically measurable variable which intervenes in time in a relationship and can be employed as an interpretation of that relationship. A disaster agent has an impact upon the normal organizational structure of the community resulting in some form of emergency organizational response. In other words, the disaster can be viewed as a change agent which alters the organizational environment in an observable way.

For our purposes the essential facts about the disaster event are the effects, actual or expected upon a given community. The following are the relevant characteristics of a disaster event:

A. <u>Frequency</u>. Certain communities are located in disaster prone areas. For example communities located in certain parts of the midwest are often hit by floods.

B. <u>Predictability</u>. This refers to the presence or absence of reliable indicators known to be associated with the occurrence of disaster events of various kinds. This characteristic is directly related to the probability of effective warning processes. Therefore it is a factor in the determination of the objective possibility of effective protective action prior to the actual occurrence of disaster agents. As such, it is one factor to be taken into account in any evaluation of the effectiveness of community response.

C. <u>Speed of Onset</u>. This refers to the suddenness of impact, rapid or gradual. The seismic waves which struck Crescent City, California in 1964 are examples of rapid onset. Gradual onset refers to a situation in which the effect of the agent is gradual but more sustained as is the case with floods. This variable has an obvious relation to the probability of effective warning and protective action. Included also here is <u>length of possible fore-</u> warning. Though distinguishable from speed of onset, it has similar consequences for community organizations, i.e. it relates to the probability of effective warning and protective action.

D. <u>Duration</u>. Disasters may be grossly conceptualized as being of limited duration or of prolonged duration, e.g. an explosion as opposed to a flood.

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E. <u>Breadth</u>. This refers to the geographic area of the community affected by the agent. It is a strictly territorial dimension.

F. <u>Intensity</u>. This refers to the extent to which normal community functions have been disrupted by the agent and is expressed in terms of the number and kinds of activity curtailed or altered by the impact. The determination of intensity requires a detailed and fairly exhaustive enumeration of the ways in which the community differs in an emergency state from its normal state. In other words the specification of intensity must be stated in terms of what changes would be necessary to restore the community to normalcy. The relationship between intensity and such factors as community coordination, therefore, is extremely important.

In summary, then, the disaster event factors include frequency, predictability, speed of onset, duration, breadth, and intensity. Any given disaster agent can be described on the basis of several of the aforementioned attributes. For example, the Indianapolis Coliseum explosion was a single, sudden, limited intensity and breadth impact without warning. The disaster is labeled as limited intensity because although the explosion was a major disaster for several organizations responsible for transporting and caring for the injured, less disruption occurred in the community as a whole. On the other hand, the magnitude of the impact of an earthquake in 1964 upon the city of Anchorage, Alaska was of considerable intensity. Anchorage received major structural damage to buildings, residences, streets, utilities, and other properties. After shocks continued for several hours causing minor additional damage. Disruption of community functions and activities was widespread. This event represents a community level disaster in the truest sense. It must be pointed out, however, that a relationship between an organizational and a community disaster exists. What we term as intensity from the community level is a matter of degree. The coliseum explosion was a minor community disaster. The community diverted some of its energy, through its organizations, to cope with a relatively localized community emergency.

Finally, it should be noted that the mere threat of a disaster is often sufficient to cause severe disruption of normal community activities. For example, the prediction of floods may be more than sufficient to threaten community values and therefore lead to some form of alteration in community affairs. The degree of disruption, in most cases, would be determined by such factors as the nature of the threat, the emergency experience of the community, etc.

## Organizations as Independent Variables

A main objective of this study has been to develop a conceptualization which can both identify and account for variations in interorganizational relationships. At the same time we have posited that interaction among a community's organizations has important implications for the quality and nature of community response during natural disasters. Both the nature and types of interorganizational relations have already been delineated. We need finally to specify the inputs i.e., community organizations, to this interorganizational response. We conceive interorganizational relationships as one aspect of organizational action during emergencies. Furthermore, the specification of an organization's interrelationships is a part of the process of the definition of organizational action. The following section will delineate this perspective.

We stated earlier that organizations represent the component parts of any community. Organizations, in effect, represent a pool or source of possible interorganizational relationships during both disasters and normal times, though our primary concern is with the former. For any organization to become involved in a community emergency it must have certain dimensions which permit response. These dimensions will be referred to as requisites for organizational action.<sup>7</sup>

The first of these requisites is <u>resources</u>, including both physical and human. An organization must possess both usable human attributes<sup>8</sup> and material resources appropriate for response to the disaster agent. Though these resources may be either existent or accessible through facilitating relationships, they must represent a disaster technology in some form. Each of the related task or problem areas of a disaster, i.e. warning, preimpact, search and rescue, caring for casualties, restoration of essential services, welfare, and community order, requires certain physical and human resources. For example, warning in many cases requires certain meteorological equipment as well as qualified personnel. The caring for casualties requires both medical resources and expertise and so on. Emergency response becomes problematic where these resources are lacking or inadequate.

Second, an organization must possess knowledge of those aspects of its environment having relevance for organizational action. This means that the organization must have some mechanism for providing inputs in the form of information concerning the nature of the disaster environment and the relationship of the organization to that environment. For example, during the Alaskan earthquake, the scope and severity of the earthquake was not well known and there were numerous attempts to obtain additional information. In one case, the fire department sent trucks and crews out to various parts of the city to check on the conditions of streets, to make surveys of potential fire hazards and to extricate victims whenever they found them. This information was relayed to headquarters and additional details were provided by returning crews reporting directly. The chief also made several tours in his car to inspect damaged areas. The police department followed much the same procedure, sending patrol cars to various parts of the city where they checked on conditions and reported back to headquarters on their radios. And several other organizations followed the same general procedures because this organizational intelligence was essential to their operation.

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Third, the organization must have some orientation to the community at large. Community orientation represents a willingness of an organization to respond to community emergency. In some cases this may be specified legally or otherwise in the form of a formal responsibility to the community at large. For example, during emergencies police activities associated with search and rescue, traffic control, security, etc. are clearly their responsibility and they respond accordingly. In other cases, this orientation represents an identification with "community welfare". This form of altruistic response is characteristic of most natural disasters both individually and collectively. Our research has shown this phenomenon repeatedly.

Fourth, an organization must have some definition as to what its specific area of responsibility is during an emergency. In some cases, such as the police and fire departments, the domain is clearly defined. In other cases, such as with private construction companies, this may be relatively unclear. Related to this is the necessity of being aware of the domain of other organizations. Definitions and mutual understandings among organizations results in domain consensus or shared expectations of response. The end result of these factors is a community disaster division of labor. In some of the empirical examples discussed in the report, this division of labor has emerged with varying degrees of efficiency. Where problems developed, they were in terms of these definitional areas.

Fifth, any organized response to disaster becomes implemented through concrete activities. Thus the organization must have operational procedures for action. These procedures may be either pre-planned or ad hoc as the emergency develops. Though pre-planning may be extensive in some organizations, (e.g. certain civil agencies) all disasters present, in some measure, nonroutine contingencies and problems. These problems must be defined, necessary resources identified and procedures developed for adequate response. Action becomes emergent and innovative rather than routine.

Finally, an organization must have some definition of its relationship to other organizations. This dimension is clearly related to all the others and is the final link to our perspective. As stated previously, interorganizational relationships may be coordinating, facilitating, or mediating; they can be identified on the basis of disaster related task areas; they have certain structural consequences. But most basically, <u>interorganizational relationships are a product of various organizations' definition of their relationship to the immediate environment i.e. other organizations, individuals, publics, the community. It is through this definitional process that interorganizational relationships become crucial to what we have called organizational action because they represent a basic requisite of that action as well as being intimately related to the other action requisites. For example, the specification of domain becomes clear through interaction with other organizations. Our illustrations of the development of emergency operation centers is evidence of this particular phenomenon. Furthermore, resources necessary for action are often contingent upon interorganizational exchange.</u>

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Interorganizational relationships are often crucial in obtaining information as to the nature of the disaster environment. Thus the linkages among the requisites for organizational action are numerous.

It is necessary to point out that many of the action requisites are pre-determined before the onset of disaster. Pre-planning and coordination in many communities specify the definitional requisites for organizational action. The nature of human and material resources is often specified by pre-existent conditions as well. Communication channels are often preestablished to permit organizational intelligence. Finally, pre-existent ties such as between police and fire departments have direct relevance for interorganizational interaction during emergencies. Obviously the above represent variable conditions which are extremely important to emergency response. The greater the presence of these conditions at  $t_1$ , the more structured will be the response. However our research rather clearly indicates that all disaster events represent in some manner an unstructured situation.

An excellent example of the above comments is the Topeka warning system in operation during the 1966 tornado emergency. Because of the prevalence of tornados in the state of Kansas during the spring and early summer months, elaborate warning systems had been developed for the city of Topeka. An intraorganizational warning system was devised to inform members of a particular organization of the occurrence and progress of storm conditions. Often this organization was a part of a larger warning network. An interorganizational system was designed to alert those organizations particularly vulnerable to the damaging effects of any tornado due to the nature and concentration of the people they contain, e.g. schools and hospitals, or which had important functions in the emergency situation, e.g. police, fire, sheriff's office, etc. A public alert system was responsible for warning the general public. During the tornado which struck Topeka, the intraorganizational and the public alert system were extremely effective, as evidence by the low ratio between the number of deaths and the amount of property damage. However, certain phases of the interorganizational system broke down, and most of the officials involved in this system were alerted to the storm conditions as members of the general public. Thus, even in this highly structured warning process, problems developed on the dissemination of information.

Our main point here is that as the situation becomes unstructured, the organizational requisites for action may become to some degree problematic. After the onset of disaster, those organizations lacking properties which permit action must acquire these definitional and action requisites. And in this area, interorganizational relationships often become crucial.

In conclusion, then, the dimensions or requisites of organizational action define the basis for organizational activity within the community. That specific activity varies according to such factors as type of organization, type of emergency, nature of impact, etc. By viewing interorganizational relationships as an essential element of an organizational action

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framework, we can conceptualize the total community's response to disaster as an aggregate of all organizational activity occurring therein. Furthermore, by delineating these relationships as we have done earlier in the report, we will be able to describe and hopefully explicate patterns of organizational interaction across several disasters in the form of comparative analysis.

## Community Effectiveness

The report concludes with a brief discussion of some criteria with which to evaluate a community's response to disaster. This is a difficult problem both analytically and practically. The basic issue which must be addressed is the determination of appropriate indicators in evaluating a community's response. In this final section, we will present some possible indices that could be used to measure community effectiveness. This discussion does not represent an exhaustive list; we are constantly searching for modifications in our research and analysis.

One method of viewing community effectiveness is through a comparative approach, i.e. the cross-comparison of communities in relation to response to similar types of disasters. A profile chart which visually plots the initiation and completion of all emergency tasks could expedite comparisons considerably with regard to such factors as time of response, situation intensity, emergency duration, etc. Similarities, differences, and problem areas could be quickly ascertained through such charts.

Another possible criteria for evaluation would be the development of measures of achievement; for example, the degree to which appropriate task areas were accomplished. From our own research on organizational response to disasters we have come to understand specific organizational task areas. However, in order to evaluate achievement with any degree of adequacy data collections and analysis must focus upon some pre-established requisites of response. These requisites must be relatively elaborate so as to allow for cross-checks for validity. Furthermore the community level presents a much more complex situation than the organizational.

Although the problem of determining requisites of effective response is difficult, we definitely feel that it is not unmanageable. For example, achievement is closely linked to stability-flexibility, integration and voluntarism.<sup>9</sup> Stability-flexibility refers to community capability in maintaining structure while adapting and innovating to meet the demands arising from the disaster environment. Integration is defined as the ability to control internal conflict within the community system. Communication and coordination have a strong influence on both stability-flexibility and integration. At the community level these two functions are usually the responsibility of a coordinating center. Voluntarism refers to the extent to which voluntary response exists in the community. By voluntarism, we mean the willingness of community components to volunteer material and personnel resources which will facilitate task performance and achievement. An example would be the involvement of extended organizations. Imbedded in the voluntary response is the general value orientation of the organizational elements in the community system such as welfare or profit.

One further point merits mentioning in this regard. From past research on disaster responses, we have come to realize that certain factors play an important role in a community. For example, such factors as the existence of disaster subcultures, coordinating centers, or communication networks are pivotal to an effective response. It appears that in assessing community effectiveness it will be helpful to in some manner tabulate the presence (+) or absence (-) of critical factors so that some quantitative measurement can be established. The construction of such a measure is tenable from a statistical standpoint. Whether this measurement will have any meaning or not should become evident in future research. At the very least such a tabulation would be beneficial in systematically summarizing the conditions present during the disaster event.

As can be seen, numerous problems are encountered in evaluating community effectiveness. To reiterate, evaluation implies some set of criteria which can be applied to all situations equally. In this manner some judgment can be made as to a community's disaster performance. These criteria should for the most part be consistent in all evaluations of effectiveness. However, there are some contingent problems which must also be considered. Of chief importance is the fact that we cannot control for all the intervening variables which may influence a particular community's response. Secondly, each community has its own unique social, economic, and demographic complexion. Though communities can be compared and typed on any of a number of relevant factors, these more or less unique qualities of any empirical community system is a universal condition. Thirdly, the often unique ramifications of the disaster agent tends to make comparative evaluation problematic. Finally, while in the past certain variables have been shown to be instrumental in effective disaster response, it is conceivable that these variables could prove to be dysfunctional in future disasters for any given community.

In conclusion, it must be stated that effectiveness in some measure is a subjective evaluation. However, efforts can be made by using appropriate indicators, such as those discussed, to give this evaluation an empirical referent. This approach will aid in decreasing the subjective choice of critical criteria for evaluating effectiveness. In other words, through the avenue of comparative research, the objectivization of judgment, about community response to disaster can be more readily obtained.

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## I. Relevant Organizations for Data Collection and Analyses

- A. Community Emergency Organizations
  - 1. Service agencies of local government (police, fire, public works, etc.)
  - 2. Public utilities (electric, gas, water, telephone, mass transit, etc.)
  - 3. Medical services (hospitals, public health departments, coroner's office)
  - 4. Relief agencies (Red Cross, Salvation Army)
  - 5. Mass Media (radio, television, newspapers)
- B. Extra-Community Emergency Organizations
  - 1. Parent or sister organization of any of the above organizations (e.g. regional Red Cross, State Civil Defense, etc.)
  - 2. Others (Military, State Police Sheriff's Office)
- C. Non-emergency Organizations with Emergency Relevant Resources
  - 1. Construction companies
  - 2. Civic and fraternal groups
  - 3. Religious groups
  - 4. Retail stores
  - 5. Transportation
  - 6. Industries
  - 7. Labor
  - 8. Educational facilities
- II. Techniques for Data Collection and Sources
  - A. Interview -- This method is used extensively by the DRC in gathering relevant data. The behavior of an organization is reflected in the actions of its members who are socialized through and have internalized the norms of the organization. Such members can and do accurately reflect and transmit their organization's position and behavior. Therefore, it is possible and realistic to expect that members of a given organization (key informants) can accurately and reliably provide descriptive accounts of past, present, and future organizational action.

Informant reports are descriptions, systematic checklists, or ratings which are obtained by the researcher from small numbers of people already familiar with the organization. People who belong to an organization or have dealings with it, generally know a good deal about that organization. Although informants may be subject to serious bias in some matters, they are able to tell us about past events we can not observe. (We, of course, attempt to cross-check information from several sources, where possible, to insure reliability.) Interviews, papers written at the researcher's request, and informative letters giving requested information are all ways of tapping this special knowledge. We include here, therefore, only information gathered from relatively few, selected informants, not obtained by mass questionnaires. People in certain positions may have unusually good information, not only the leaders, but also specialists, long tenure personnel, etc.

A primary objective of interviewing in is to obtain information related to interorganizational relationships. Our goal, as stated in the report, is to identify community organization interaction nets. Therefore, key informants are those persons who are in the best position to tell us about interrelationships among community organizations. In any organization, the following personnel appear to be more likely to have this information:

- 1. Administrative Head
- 2. Operations Head
- 3. Boundary Personnel
  - a. Public Relations Officers
  - b. Inspector (i.e. personnel from one organization who are required to inspect the work done on certain projects by other organizations).
  - c. General liaison personnel.
  - d. Communications personnel (although these may be the least visible and therefore often most easily overlooked, they may in fact be the most crucial persons to talk with. Their comments, along with tapes and communications logs, are often crucial sources of information on interorganizational relationships via radio, telephone, etc.)
  - e. Other organizational personnel who might be knowledgable.

The effort is to ascertain the number and names of all community organizations involved in the various task activities described in the report as well as some index of interaction in  $t_1$  (pre-disaster); second, to determine the nature of interorganizational relationships i.e. coordinating, facilitating, mediating. In this manner, such factors as the authority structure or organized activity, the presence of sets and subsets, the degree of **aut**onomy exhibited by various organizations, and the nature of extra-community ties becomes apparent.

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- B. Institutional Records: These may take the form of raw files, records of decisions, transcripts of meetings, lists of rules or other prepared statistics. In some cases the data are found in generally published sources such as directories or government reports; in other cases it must be sought in the organizations files. Most organizations keep voluminous records, although they seldom have prepared precisely those statistics which the researcher would like. Other sources include some of the following:
  - 1. Communications logs
  - 2. Tape recordings

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- 3. Telephone bills or calls (especially long distance)
- 4. Minutes of interorganizational meetings
- 5. Press releases
- 6. Written messages
- 7. Photographs (taken by either organization personnel or by the researcher)
- C. Direct Observations: These include field notes by the researcher describing organizational activity; systematic checklists and procedures for coding observations; ratings of organizational properties or action on the basis of observations; and the use of cameras in conjunction with some other type of recording such as field notes.

Through the above methods, information regarding all the relevant variables for an analysis of community coordination can be obtained. Of course, some data is much more difficult to obtain than others. For example, ecological and demographic data concerning the contextual variable (the community) can be obtained with minimal difficulty. On the other hand information relating to •rganizational interaction requires much more involved effort.

#### Notes

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