Warren (1963) describes vertical integration as the 'structural and functional relation of (a community's) various social units and subunits to extra-community systems'. Under this form of integration, power differentials and inequality are evident. A community with a high degree of vertical integration has a relatively large number of ties with larger political, social, and economic institutions. Vertical integration helps to expand the resources (funds, influence, and so forth) potentially available to the community. Moreover, issues of local concern have a greater chance of being communicated to central authorities.

The extent to which strong vertical integration is beneficial is strongly related to the strength of horizontal relationships. When horizontal integration is weak, communities are basically powerless, subordinate, and dependent on outside forces. When the community has a strong network of horizontal resources, however, it has an increased ability to exert control over external interventions, such as siting of interstate highways (Rohe and Mouw, 1991) and toxic chemical facilities (Kunreuther and Linnerooth, 1983), and the initiation of development programs in developing countries (Ascher and Healy, 1991; Harrell-Bond, 1986). Resources from outside organizations are more likely to fit the specific needs of communities as vertical integration induces cooperation in negotiating intergovernmental arrangements. Furthermore, local organizations can enhance the work of external organizations through the use of field staff and through their knowledge of local circumstances in carrying out external initiatives.

Conversely, a lack of strong vertical integration between communities and outside organizations can create problems, particularly when combined with a weak system of horizontal integration. This condition can result in a loss of local control over outside programs. Under this situation knowledge of intentions, procedures, requirements, and benefits of outside programs is likely to be weak. Interaction among local and outside organizations is low. Consequently, the chances of external programs fitting local needs and capacities are reduced.

Figure 2 shows the potential relationships between horizontal and vertical integration as depicted by four types of communities. A Type I community is ideally suited for an effective recovery effort. It possesses strong vertical and horizontal integration. It has well developed ties to external resources and programs, while it has a viable horizontal network that will allow it to exert power and influence in the recovery process. A Type II community represents an autonomous, relatively isolated community with few vertical ties (an increasingly rare phenomenon in the late 20th century). While it has a viable local structure, it suffers from a lack of knowledge about and interaction with important external resources.[2]

A Type III community is in a classic state of powerlessness and dependency. Lacking a viable formal horizontal network, it is less likely to be able to influence the recovery process. Therefore, it is more likely that the recovery effort will not be consistent with local needs, concerns or values. A Type III community has the advantage of at least having vertical ties and channels for external aid. Type IV communities lack this facilitating condition. A Type IV community faces significant obstacles to undertaking successful recovery efforts as it lacks access to external resources. If those vertical channels are activated, however, it still lacks a viable, local horizontal structure for effectively receiving aid or influencing the recovery process.

The strength of pre-disaster horizontal and vertical ties can have a substantial impact on how they influence post-disaster recovery efforts. Indeed, Wenger (1978) maintains that while significant alterations to such ties occur during the immediate

Vertical / Horizontal	Strong	Weak
Strong	**Type 1**	**Type 2**
Weak	**Type 3**	**Type 4**

FIGURE 2 *Community types by degree of horizontal and vertical integration*

post-disaster emergency response phase, the 'normal institutionalized' horizontal and vertical linkages tend to be reestablished during the long-term recovery period. In other words, the post-disaster ties tend to reflect those of the pre-disaster period.

As with any parsimonious model, caution is suggested because the actual processes by which integration influences recovery are not illustrated by simple classification. Nor are the many types of interaction that can create horizontal and vertical relationships or, in their absence or failure, constrain the creation of such relationships. For example, in a homogeneous and affluent community, interests among local people are similar and ties with agencies that have outside resources available for recovery tend to be high. As a result, there is convergence of horizontal and vertical integration. But in communities with more diverse distributions of power and resources, conflict and confrontation often must occur in order for long-term recovery to be effective. Instances of such conflict were prevalent in the experience of minority citizens in recent U.S. disasters like Loma Prieta and Hurricane Hugo, but these issues have long been prominent in research on developing countries (Harrell-Bond, 1986). The model nonetheless provides a framework for researchers and practitioners to raise questions needed to uncover these processes.

To demonstrate the conceptual and practical significance of this parsimonious model of horizontal and vertical integration we present three case studies of local recovery experiences. The case studies demonstrate how pre-disaster horizontal and vertical integration (or lack of it) has strongly influenced post-disaster outcomes. These cases cut across domestic and international settings as well as developed and developing societies.

Case Studies

Santa Cruz County, California. Before the 1989 Loma Prieta earthquake Santa Cruz County could be classified as a Type II community. Horizontal integration was high as the county had a high degree of citizen interest group political activity and experience in seeking responses from government. Much of this activity can be traced to the occurrence of three presidentially declared

disasters (floods, landslides, and wildfires) in the county during the period of 1982 to 1986. These disaster experiences induced the county government to develop new partnerships and capabilities with its citizens. Specifically, a cooperative association of households, known as the 'Neighborhood Survival Network' (NSN) was established. The primary objective of this community-based organization was to pre-inventory and organize for citizen self-help in future disasters (United Way of Santa Cruz County, 1991).

Citizens involved in the network also collaborated with other local volunteer and social service organizations to develop a multi-purpose outreach center, known as the Valley Resource Center. This center was also supported by a region-wide 'Human Care Alliance' developed to coordinate the efforts of the 60 small private voluntary community-based organizations in the county and surrounding areas.

After the Loma Prieta event, this high degree of horizontal integration was vital to aiding the overlooked minority and low income population in rural mountain neighborhoods, and to providing a basis for increasing vertical integration. When the Federal Emergency Management Agency (FEMA) initially opened a Disaster Assistance Center (DAC) in the City of Santa Cruz, citizen leaders maintained that they could make household recovery aid more accessible to the county's rural population by opening a satellite DAC in the Valley Resource Center. The center, in turn, could use its well established ties with the Neighborhood Survival Network to assess needs and distribute assistance. FEMA accepted the offer after local leaders pointed out that numerous rural households that sustained damages had been overlooked because of FEMA's initial assumptions about local conditions (United Way of Santa Cruz County, 1991).

In this case, Santa Cruz County moved from a Type II local jurisdiction before the earthquake to a Type I jurisdiction after the event. The successful vertical integration of locally developed organizations and facilities with standard federal disaster recovery field operations resulted in a more effective effort to identify and aid affected households.

In summary, earlier disaster experiences in Santa Cruz County stimulated local horizontal integration. Subsequently, local problem solving capacity was expanded by vertical integration between federal relief efforts and local organizations. This setting was an improvement over what a local staffer for the NSN observed as 'overlays of federal requirements that create a program for frustration and delay'.[3] The county experience demonstrates how adaptations and learning from recovery can enhance local capacity to solve problems and provide services.

Montserrat, West Indies. Before the Hurricane Hugo disaster of 1989, Streatham Village of the small island state of Montserrat in the Eastern Caribbean was a Type III community (Berke and Wenger, 1991). There was a moderate degree of vertical integration, but horizontal integration was very limited. After Hugo struck, a collaborative recovery effort evolved between an international development oriented nongovernmental organization (NGO) from Canada (Canadian University Students Organization), an intermediary NGO from the region (Caribbean Conference of Churches) with long standing external ties to foreign donor organizations, and a local community action group that was an NGO as well. The Canadian NGO sought to provide housing recovery assistance after Hugo by establishing a cooperative arrangement with the intermediary NGO which had been involved in community development work in Streatham Village for several years before the disaster.

The arrangement involved the Canadian NGO providing funds to the intermediary

for undertaking reconstruction activities in Streatham. The intermediary, in turn, worked with the community action group to initiate a new housing assistance program. The intermediary NGO trained local people and provided funds to temporarily employ local people to undertake reconstruction activities. The Canadian NGO also supplied the program with building materials and logistics for transporting the material.

The accomplishments of the new program were substantial. Community action group staff conducted a series of training workshops on rebuilding and structural strengthening techniques, rebuilt over 20 homes, and repaired many others. Of greatest significance, however, were the long-term developmental accomplishments. The local visibility and sense of importance of the community action group were raised considerably as a result of its disaster reconstruction activities. The voluntary participation of local citizens in group activities was also much higher, compared to pre-disaster levels. Such heightened interest and participation strengthened the community action group's capacity to undertake various development projects that were not directly related to disaster recovery.

Specifically, the intermediary NGO and the community group had planned to undertake three local improvement projects before Hugo, including introducing new agricultural production practices, building a community center and improving the potable water distribution system. These projects were to be carried out on an incremental basis over a 10 year period. However, because the group had increased capacity to take collective actions and the Canadian donors had gained a better understanding of local needs and capacities (as will be discussed), the Canadian NGO became convinced that additional external aid could be effectively used in Streatham Village. Indeed, the improvement projects were completed over a two year period. Moreover, the community group appears to be self-sustaining in establishing and maintaining an economically viable local agricultural production and marketing cooperative (Berke and Wenger, 1991).

The Canadian donors gained a better understanding of the needs and capacities of Streatham Village by sponsoring a series of seminars in Canada on the accomplishments of the community action group. Specifically, the local group coordinator was sent to Canada for three weeks to conduct numerous seminars attended by Canadian supporters. These seminars provided a unique opportunity for a grass roots organizer to demonstrate how foreign aid was used. The coordinator was able to give donors a first-hand account of the program, as opposed to a second-hand account given by external NGO staff The donors thus gained a better understanding of the issues. In particular, external donors learned that successful recovery is not only product oriented (e.g., number of homes rebuilt), but also addresses local organizational capacity building and long-term development concerns.

In summary, the Montserrat case represents a change from a Type III to a Type I community. The disaster was viewed as an opportunity to strengthen local horizontal integration. The goal of the international NGO was to empower the local group (and the intermediary), and not to do the work itself. Another significant outcome of this collaborative arrangement was the reinforcement of pre-existing vertical ties among the key participants. In particular, foreign donors developed a better understanding of the institutional capacity building needs for effective recovery and development. This process overcame the 'brick and mortar' orientation to success, which is often the case concerning international disaster and development aid interventions (Harrell-Bond, 1986).

Saragosa, Texas. This small, isolated Mexican–American community in the southwest Texas desert was a Type IV community before a devastating tornado in 1987 (Pereau, 1990). Indeed, Saragosa had a much lower capacity to cope with the demands of disaster recovery compared to the other two case studies. Before the tornado, the community had no locally incorporated government. What official governance existed was at the county level and was administered in the county seat more than 20 miles from Saragosa. On another front, a church was the only NGO operating in Saragosa before the disaster. However, the church had no administrative staff or clergy residing within the community. Instead, the sole clergy member (a priest) resided in a community more than 50 miles from Saragosa.

The result of such a low degree of horizontal and vertical integration was that disaster recovery initiatives were for the most part organized outside of the community, with little input from local people. While a disaster recovery advisory board was created to oversee reconstruction and to make decisions in response to external assistance, the committee was established by the distant county judge without a mandate from Saragosans. An obvious outcome of this process was that the committee encountered a great deal of internal politics and social resistance (Pereau, 1990). Indeed, the idea that the citizens might be given assistance to rebuild and to organize their own reconstruction was apparently never seriously considered by the external governmental and nongovernmental agencies responsible for funding and rebuilding. A citizen advisory committee member observed:

> They say we received a lot from the agencies, churches, and others from the outside world and they say we are spoiled kids. I really think that we could have had more input into what they were going to do . . . more choices . . . I would like to [have] set up a committee of all the agencies, and find out what they could do; and then I would have input from the people. Ask the people, and then try to work out what could happen (Pereau, 1990, p. 19)

The outcome of the recovery process was predictable. Compared to pre-disaster conditions, Saragosans considered themselves much worse off two years after the disaster. Thus Saragosa became a more firmly entrenched Type IV community. Evidence from a random survey of residents revealed strong dissatisfaction with post-disaster housing conditions (Pereau, 1990). More than half of all disaster stricken residents surveyed indicated that the replacement housing was 'worse' for a variety of measures, including quality, size, comfort, and 'feelings' about the physical layout of rebuilt neighborhoods.

Breaking this hardened cycle of poverty and despair has been the major challenge of the international development community. What follows is a discussion of actions that need to be taken to enhance prospects for successful recovery.

IMPLICATIONS FOR POLICY AND FUTURE RESEARCH

Communities can take steps before and after a disaster to enhance the likelihood of achieving sustainable development, mitigation, and equity in aid delivery during recovery. As illustrated by the recovery model and cases reviewed here, there are numerous local organizational and citizen capabilities that can be integrated into the recovery process. Such horizontal integration can involve organizational collaboration between community based groups and local government (as in Santa Cruz County), or international donor organizations (as in Montserrat). It can also involve adaptation of conventional policy tools for land use and comprehensive planning (e.g. zoning, structural strengthening code, and public facility investment) to meet

reconstruction needs and opportunities (as in Santa Rosa).

Furthermore, the experiences documented by the limited research on disaster recovery shows that vertical integration can be more effective at meeting local needs when activities that strengthen horizontal integration before and during recovery are present Thus communities need to know how to use potentially relevant organizations and policy tools to prevent loss of significant opportunities for mitigation and development, and to increase the likelihood that external aid programs are flexible in meeting local needs and capabilities.

The recovery model and cases presented here, however, only begin to illustrate how horizontal and vertical integration might occur. Research that provides a broader application of the model is needed for additional understanding of disaster recovery responses in other cultural and social settings. Such applications should be focused on other forms of communities or societies, in other parts of the world, which are faced with other types of disasters, such as drought and epidemic

An increasing number of communities with disaster experience are meeting demands posed by disaster recovery through the development of specific post-disaster redevelopment plans and through the revision of general land use and comprehensive plans. The nongovernmental sector likewise is developing new organizational networks, such as the Neighborhood Survival Network disaster planning effort in Santa Cruz County, and the community action group in Montserrat of the West Indies.

Communities need to evaluate pre-disaster recovery capacity and potential rebuilding opportunities posed by likely damage patterns of a disaster. A locality can identify its existing general redevelopment strategy (or lack of one) using a typology of potential disaster recovery tools. The typology includes three broad categories of tools that could be used for guiding redevelopment: (1) regulatory measures (e.g., building codes, zoning, development moratorium), which are coercive in that they attempt to control the activity of specific interest groups; (2) incentive measures (e.g., development density bonus, capital improvement program, property acquisition), which are non-coercive in that they aim to induce, rather than require, desired redevelopment; and (3) informational measures (e.g., rebuilding workshops, reconstruction plans, dissemination programs on availability of disaster assistance), which enable people to make informed redevelopment decisions.

A community can evaluate whether the tools used in existing local land use and comprehensive planning programs are appropriate for meeting recovery needs and opportunities. A community may, for example, have adopted a mix of regulatory and incentive tools for the revitalization of deteriorated commercial areas and the eventual upgrading of land uses through attrition, demolition, and private reinvestment. When considering disaster recovery needs, however, the strategy may also need to include structural strengthening and housing replacement needs.

Similarly, the community needs to evaluate the existing and potential roles of local government agencies and community based nongovernmental organizations for future recovery efforts. Several key questions need to be considered. Are the appropriate organizations currently involved in local planning programs? Would their role change, or be needed, in recovery? Recall, for example, that Santa Cruz County discovered the need for a community disaster survival network as a result of previous disaster experiences. Also an international donor organization viewed the Hurricane Hugo disaster as an opportunity to build the capacity of a pre-existing community action group in Montserrat to undertake self-directed long term development initiatives.

Besides the lack of stimulus from previous disasters is the lack of a systematic evaluation of (a) the local use of policy tools for guiding redevelopment, (b) the local organizational capacity to carry out recovery initiatives and (c) the costs and benefits of integrating recovery planning with ongoing land use and comprehensive planning programs. In addition, opportunities for examining the potential for international collaboration have received limited attention. Research is needed on the types of planning tools currently available for recovery in communities and on the existing roles of governmental and nongovernmental organizations. The feasibility of reorienting existing tools to incorporate recovery demands, as well as the adoption of new tools, needs to be investigated in terms of fiscal and political dimensions.

Moreover, an inventory of current tools and partnerships is crucial for providing a basis for designing appropriate disaster recovery strategies based on variations in local organizational capacities and experience with planning. Some communities, like Santa Cruz County, have strong horizontal ties among individuals and organizations. Others, like Santa Rosa, have considerable experience with policy tools in guiding urban development. Still others, like Saragosa, have a low organizational capacity and are inexperienced in using policy tools to undertake self-directed recovery initiatives. Clearly, these differences call for flexible responses, rather than the conventional, standardized aid delivery strategies of state and federal governments and nongovernmental donor organizations

Notes

1. We recognize that both development researchers (e.g., Uphoff, 1984) and disaster researchers (e.g., Wenger, 1978) point out that there are two variants of the concept of horizontal integration. First, formal horizontal integration deals with relationships that are contractual and institutionalized between organizations. They include a variety of forms, but primarily include the formal arrangements between organizations. Second, informal horizontal integration deals with relationships among local individuals and organizations. They represent the patterns of neighboring, social interaction and mutual support. They are outside the formal structures of government, the economy and other institutional areas. For purposes of parsimony, however, we do not decipher between formal and informal horizontal integration in our presentation of the conceptual model. Indeed, these two variants have the same effect on horizontal integration. That is, change in either variant is positively associated with change in overall horizontal integration.
2. Warren (1963) and others have long argued that, with the increasing scale of society and spread of vast organizational networks throughout the land, vertical ties are strengthening. In contrast, local horizontal integration and autonomy have decreased.
3. Mary Hammer, Director of the Valley Resource Center. Personal interview with Philip Berke and Jack Kartez, February 7, 1992.

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