|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Activity | Population mean (min) | Doer  mean (min)\* | Activity | Population mean (min) | Doer  mean (min)\* |
| Sleeping | 504 | 506 | Child care | 18 | 79 |
| Working | 194 | 424 | Active sports | 16 | 88 |
| Electronic media | 143 | 184 | Outdoor recreation | 11 | 134 |
| Travel | 109 | 118 | Cultural events | 10 | 143 |
| Eating | 89 | 93 | Errands | 8 | 41 |
| Socializing | 56 | 115 | Car repair | 6 | 48 |
| Personal care | 50 | 58 | Hobbies | 5 | 114 |
| Reading/writing | 48 | 104 | Bars/lounges | 4 | 101 |
| Education | 46 | 237 | Animal care | 3 | 33 |
| Cooking | 38 | 73 | Singing/dancing | 3 | 106 |
| House cleaning | 34 | 87 | Other | 2 | 29 |
| Shopping | 25 | 66 | Dry cleaners | 1 | 73 |
| Yard work | 20 | 111 | Services | 1 | 83 |

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Activity | Code | Activity |
| 11 | Agriculture, Forestry, Fishing & Hunting | 53 | Real Estate & Rental & Leasing |
| 21 | Mining | 54 | Professional, Scientific, and Technical Services |
| 22 | Utilities | 55 | Management of Companies and Enterprises |
| 23 | Construction | 56 | Administrative and Support and Waste Management and Remediation Services |
| 31-33 | Manufacturing | 61 | Educational Services |
| 42 | Wholesale Trade | 62 | Health Care and Social Assistance |
| 44-45 | Retail Trade | 71 | Arts, Entertainment, and Recreation |
| 48-49 | Transportation & Warehousing | 72 | Accommodation and Food Services |
| 51 | Information | 81 | Other Services  (except Public Administration) |
| 52 | Finance and Insurance | 92 | Public Administration |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Week 1 | | | | Week 2 and beyond | | | |
| Emer-gency Shelter | Temp-orary Shelter | Temp-orary Housing | Perm-anent Housing | Emer-gency Shelter | Temp-orary Shelter | Temp-orary Housing | Perm-anent Housing |
| Emergency  Shelter | .60 | .40 | .00 | .00 | .50 | .50 | .00 | .00 |
| Temporary  Shelter | .00 | .90 | .10 | .00 | .00 | .90 | .10 | .00 |
| Temporary  Housing | .00 | .00 | .95 | .05 | .00 | .00 | .95 | .05 |
| Permanent  Housing | .03 | .05 | .00 | .92 | .00 | .00 | .00 | 1.00 |

6, lower income households tend to have higher hazard exposure because they live in more hazard prone locations. They also have higher physical vulnerability because they live in structures that were built according to older, less stringent building codes, used lower quality construction materials and methods, and have been less well maintained (Bolin & Bolton, 1986). Because lower income households have fewer resources on which to draw for recovery, they also take longer to return to permanent housing, sometimes remaining for extended periods of time in severely damaged homes (Girard & Peacock, 1997). Indeed, they sometimes are forced to accept as permanent what originally was intended as temporary housing (Peacock, et al., 1987). Consequently, there might still be low income households in temporary sheltering and temporary housing even after high income households all have relocated to permanent housing (Berke, et al., 1993; Rubin, et al., 1985).

*Employment Recovery*

Insurance coverage varies by hazard agent, with Bolin and Bolton (1986) reporting 86% coverage for a tornado and Bolin (1993) reporting 25% for an earthquake. Risk area residents are particularly likely to forego earthquake insurance because they consider premiums to be too high and deductibles too large (Palm, et al., 1990). Income, education, and occupational status all correlate with earthquake insurance purchase (Bolin, 1993).

Strategies for coping with uninsured losses include obtaining SBA or commercial loans, obtaining FEMA or NGO grants, withdrawing savings, and deciding not to replace damaged items (Bolin, 1993). SBA loans can be problematic because they involve long term debt that takes many years to repay (Bolin, 1993). FEMA grants require households to meet specific standards, including proof that they are indeed residents of the disaster impact area. However, there can be problems in registering people who evacuated or were rescued without identification (Yelvington, 1997). Relaxed standards seem humane but can allow the chronically homeless and out of area construction workers to obtain access to services intended only for disaster victims. In turn, resentment toward “freeloaders” can curtail services to victims.

Some households’ economic recovery takes place quickly, but others’ takes much longer. For example, the percentage of households reporting complete economic recovery after the Whittier earthquake was 50% at the end of the first year but 21% reported little of no recovery even at the end of four years (Bolin, 1993). Economic recovery was positively related to household income and negatively related to structural damage, household size, and the total number of moves (Bolin, 1993). In some cases, this is due to the loss of permanent jobs that are replaced only by temporary jobs in temporary shelter management, debris cleanup, and construction—or are not replaced at all (Yelvington, 1997).

There are systematic differences in the rate of economic recovery among ethnic groups. For example, Bolin and Bolton (1986) found that Black households (30%) lagged behind Whites (51%) in their return to preimpact economic conditions eight months after the 1982 Paris, Texas, tornado. However, the variables affecting economic recovery were relatively similar for Black and White families (see Figure 11-6). In both ethnic groups, economic recovery was negatively related to family size (larger families had lower levels of recovery), but positively related to socioeconomic status (SES—education, profession, and income), use of disaster assistance, insurance adequacy, and aid adequacy. In addition, Black household recovery was negatively related to primary group aid and the number of household moves. The direct effect of family size and SES on economic recovery was compounded by the indirect effects of these variables via their impacts on the use of disaster assistance, insurance adequacy, aid adequacy, and household moves. The variables that had positive direct effects on economic recovery (use of disaster assistance, insurance adequacy, aid adequacy) were negatively related to family size and positively related to SES. That is, larger households were less likely—and higher SES households were more likely—to use disaster assistance, have adequate insurance, or receive adequate aid. Moreover, these variables were positively related to family size and negatively related to SES. That is, larger households made more moves and higher SES households made fewer moves. The overall effect of this complex pattern of relationships is for large poor households to be doubly handicapped in their economic recovery.

**Figure 11-6.**Patterns of Household Economic Recovery.

Source: Bolin and Bolton (1986)

*Psychological Recovery*

Few victims develop major psychological problems from disaster impacts. Indeed, Gerrity and Flynn (1997, p. 108) proposed “the overarching principle of mental health services after disasters is that the recipients of services are normal people, responding normally, to a very abnormal situation.” Consequently, the vast majority of disaster victims experience mild psychological distress. For example, Bolin and Bolton (1986) found negative impacts such as upsets with storms (61%), time pressures (48%), lack of patience (38%), and strained family relationships (31%) after the Paris Texas tornado. However, victims also experienced positive impacts including strengthened family relationships (91%), decreased importance of material possessions (62%), and increased family happiness (23%). The data showed only minor differences between Blacks and Whites in the prevalence of psychosocial impacts.

Similarly, roughly 35% of affected households reported one or more symptoms of psychological distress attributable to the Whittier earthquake (Bolin, 1993). These included startle response (60%), sadness (38%), avoidant thinking (36%), vivid upsetting memories (33%), unexplained agitation (29%), social isolation (25%), bad dreams (20%), and sleep disturbances (15%). Degree of emotional recovery was positively related to age, male gender, previous disaster experience, social integration, and receipt of aid from primary groups.

Researchers have also examined public records in their search for psychological impacts of disasters. For example, Morrow’s (1997) examination of vital statistics (births, marriages, deaths, and divorce applications) had no significant long term trends due to Hurricane Andrew. However, domestic violence rates remained constant for about six months after the hurricane but increased about 50% for nearly two years after that. In all, only 12% of the households affected by Hurricane Andrew expressed a need for counseling (Morrow, 1997). After the Whittier earthquake, Disaster Assistance Centers referred only 5% of victims to mental health counseling (Bolin, 1993). The effects most of these victims have experienced are usually not debilitating but are, rather, part of the normal process of grieving people use to understand and assimilate important, traumatic events. Moreover, victims accumulate many minor and major frustrations throughout the disaster recovery. This is especially true for those who must interact repeatedly with public (governmental) and private (e.g., insurance companies) bureaucracies.

Nonetheless, there are especially vulnerable groups that might need extra attention if they show signs of long standing problems due to the disaster. It should be obvious that people with preexisting mental conditions are likely to need postdisaster psychological support. Moreover, victims who have witnessed the death or severe injury of loved ones should have professional psychological services available (Perry & Lindell, 1978). Single female heads of household experienced extremely high levels of stress in their relationships with significant others, children, and relatives and friends (Morrow, 1997). In a community where the schools were on half day sessions, children in one third of families displayed behavioral problems (Morrow, 1997). Moreover, approximately 50% of children displayed symptoms of moderate to severe PTSD after Hurricane Andrew (Vernberg, LaGreca, Silverman & Prinstein, 1996). Finally, professionals involved in particularly difficult search operations and medical personnel who handle extraordinary work loads during disaster periods might also benefit from postdisaster counseling.

In summary, the majority of victims and responders recover relatively quickly from the stress of disasters without psychological interventions. Those who suffer the greatest losses to their material resources (e.g., the destruction of their homes) and their social networks (e.g., spouses and other family members) are likely to experience the most psychological distress, but not necessarily an amount that is personally unmanageable. Thus, the appropriate strategy for psychological recovery by victims and first responders seems to be one of minimal intervention to provide information about sources of material support (for victims) and to facilitate optional involvement in social and emotional support groups (for victims and first responders).

*Sources of household recovery assistance*. Household recovery can also be defined in terms of the sources of assistance. Bolin and Trainer (1978) defined these sources as the family structure (stage in the family lifecycle) and resources (socioeconomic status), the kinship network (cohesiveness), and the community resource (financial, human, and material resources) and normative (beliefs about appropriate policies for distributing postdisaster aid) structure. The extent to which households rely on one or another of these sources of recovery assistance defines their mode of recovery as autonomous, kinship, or institutional—although few households actually rely on only one source.

Autonomous recovery depends on the household’s available human, material, and financial resources. Human resources are available to the extent the household members have come through the disaster alive, uninjured, and with a sense of optimism that they can recover. Household recovery also depends on the degree to which members can continue to derive generate incomefrom employment, rental of physical assets, or interest/dividends from financial assets. Moreover, household recovery depends on the degree to which material resources are available. This includes the extent to which its possessions—land, buildings, equipment, furniture, clothes, vehicles, crops, and animals—are undamaged or can be restored at reasonable expense. A household’s recovery also depends on the degree to which its financial resources are available. This includes an ability to withdraw savings quickly from banks, to quickly liquidate stocks and bonds at a fair price, and to receive adequate compensation from its insurer. In some cases, household recovery also depends on the degree to which creditors will accept delayed payments on financial liabilities such as loans, mortgages, and credit card debt. Finally, household recovery depends on the degree to which members can reduce consumption such as purchases of shelter, food, clothing, medical care, entertainment, and other goods and services).

Kinship recovery depends on the physical proximity of other nuclear families in the kin network, the closeness of the psychological ties within the network, the assets of the other families and, of course, the extent to which those families also suffered losses. Institutional recovery quite obviously depends on whether victims meet the qualification standards, usually documented residence in the impact area and proof of loss. However, institutional recovery depends more subtly on households’ ability to devote the time and effort required to travel to assistance centers and wait to process any applications, the availability of transportation and child care needed to free that time from other activities, and the ability to fill out the paperwork and cope with the impersonal bureaucratic requirements of the recovery system.

Some aspects of household recovery are relatively similar across ethnic groups, but others reveal distinct differences. For example, Table 11-4 shows Anglos, Blacks, and Hispanics experienced similar levels of frustration in coping with the challenges of living in damaged homes, job relocation, dealing with agencies, behavioral problems with children, and loss of household members. However, most of these commonalities were for relatively infrequently experienced problems (the ones listed at the bottom of the table). By contrast, there were significant differences in the experience of other problems, many of which were frequently experienced. For some problems, the Anglos reported the greatest frequency of frustration, whereas for other problems it was Hispanics experiencing the greatest frustrations. In general, Blacks had the highest level of frustration with more problems than either of the other two groups.

# Business Recovery

Several studies of the economic impacts of environmental disasters have examined the ways in which individual businesses prepare for, are disrupted by, and recover from these events. Dahlhamer and D’Souza (1997), Dahlhamer and Reshaur (1996), Drabek (1991c, 1995), Lindell and Perry (1998), Tierney (1997a, 1997b), Tierney and Dahlhamer (1998), and Whitney, et al. (2001) studied the adoption of hazard adjustment (hazard mitigation, emergency preparedness, and disaster recovery preparedness) measures for environmental hazards. These studies found older, larger (measured by the number of employees), and more financially stable businesses are more likely to adopt hazard adjustments, as are businesses in the manufacturing, professional services, and finance, insurance and real estate sectors.

These studies have found disasters disrupt business operations through a variety of mechanisms (Alesch, et al., 1993; Kroll, et al., 1990; Tierney, 1997b; Tierney & Nigg, 1995; Webb, et al., 2000). Direct physical damage to buildings, equipment, vehicles, and inventories has obvious effects on business operations. However, it might be less obvious that disruption of infrastructure such as water/sewer, electric power, fuel, transportation, and telecommunications frequently forces businesses to shut down in the aftermath of a disaster. For example, Tierney (1997b) reported that extensive lifeline service interruption after the 1993 Midwest floods caused a large number of business closures in Des Moines, Iowa, even though the physical damage was confined to a relatively small area.

**Table 11-4**. Household Recovery Problems, by Ethnic Group.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Problem Perceived To Be Large | Anglo | Black | Hispanic | Total |
| Dealing with mortgage companies about insurance money | 68 | 49 | 68 | 64\* |
| Dealing with building inspectors | 52 | 38 | 76 | 63\* |
| Living in damaged home | 59 | 63 | 59 | 60 |
| Neighborhood conditions | 55 | 60 | 39 | 47\* |
| Living in temporary quarters | 45 | 61 | 38 | 46\* |
| Dealing with insurance companies | 33 | 26 | 48 | 40\* |
| Dealing with contractors | 38 | 18 | 45 | 37\* |
| Unemployment | 11 | 29 | 30 | 25\* |
| Household finances | 14 | 40 | 20 | 22\* |
| Neighborhood crime | 34 | 23 | 16 | 22\* |
| Transportation | 2 | 28 | 17 | 16\* |
| Job relocation | 7 | 21 | 17 | 15 |
| Dealing with agencies | 11 | 20 | 13 | 15 |
| Behavioral problems with children | 19 | 18 | 10 | 14 |
| Family violence | 17 | 11 | 5 | 9\* |
| Gain of member(s) | 14 | 0 | 4 | 5\* |
| Loss of member(s) | 4 | 0 | 13 | 4 |

Source: Morrow (1997) Difference between highest and lowest percentage significant at p < .05.

Small businesses are more physically vulnerable because they are more likely than large businesses to be located in nonengineered buildings and are less likely to have the capacity to design and implement hazard management programs to reduce this physical vulnerability. Thus, in this respect, small businesses are equivalent to the most physically vulnerable households—ones that are poor, female headed, or members of ethnic minorities. At the same time as they face increased costs to repair structures and replace contents, these businesses also face reduced patronage if they must move far from their previous locations. Three years after the Whittier earthquake, 50% of destroyed commercial space and 100% of damaged commercial space had been replaced (Bolin, 1993). In the meantime, however, a number of businesses in the old central business district—predominantly located in unreinforced masonry structures—were forced to relocate. Because Whittier is located within the Los Angeles metropolitan area, local residents could readily obtain the goods and services they needed from undamaged businesses in adjacent communities. Thus, by the time the space is available for reoccupancy, it must be leased to new tenants because the old ones did not have the resources to wait that long.

Perhaps the least obvious effects of disaster impact are population dislocation, losses in discretionary income among those victims who remain in the impact area—which can weaken market demand for many products and services—and competitive pressure from large outside businesses. All of these indirect effects cause small local businesses to experience a high rate of failure in the aftermath of a disaster (Alesch & Holly, 1996; Alesch, Holly, Mittler & Nagy, 2001). Indeed, these factors can produce business failures long after the precipitating event, especially if the community was already in economic decline before the event (Bates & Peacock, 1993; Durkin, 1984; Webb, et al., 2002). Thus, businesses that were marginally profitable before a disaster strikes are more likely to close immediately after the event.

There also is variation among business sectors in their patterns of recovery. Whereas wholesale and retail businesses generally report experiencing significant sales losses, manufacturing and construction companies often show gains following a disaster (Durkin, 1984; Kroll, et al., 1990; Webb, et al., 2000). Moreover, businesses that serve a large (e.g. regional or international) market tend to recover more rapidly than those that only serve local markets (Webb, et al., 2002). Small businesses, in particular, have been found to experience more obstacles than large firms and chains in their attempts to regain their predisaster levels of operations. Compared to their large counterparts, small firms are more likely to depend primarily on neighborhood customers, lack the financial resources needed for recovery, and lack access to governmental recovery programs (Alesch & Holly, 1996; Alesch, et al., 2001; Dahlhamer & Tierney, 1998; Durkin, 1984; Kroll, et al., 1990). Thus, business sector and business size can be seen as indicators of operational vulnerability that are equivalent to the demographic indicators of social vulnerability in households.

Businesses’ hazard vulnerability explains the changes a disaster causes in businesses’ production, sales, and profits and, thus, the dynamics of business recovery. In particular, four cases can be used to illustrate firms’ variation in their postdisaster sales levels (Zhang, Lindell & Prater, 2004). According to Figure 11-7, gains and losses in sales (the vertical axis) over time (the horizontal axis) are defined by the area enclosed within the (vertical) disaster line, the (horizontal) predisaster sales level, and the (diagonal) recovery curve. Gains are represented by the size of the area above the predisaster sales level and losses are represented by the size of the area below the predisaster sales level (the shaded area in each panel).

**Figure 11-7**.Patterns of Business Sales Changes after Environmental Disasters.

Source: Zhang, et al. (2004)

The first case is defined by businesses in the impact area that have minimal hazard vulnerability. Such businesses—professional services are an example—experience only small decreases in sales after disaster impact and return quickly to their predisaster levels (Figure 11-7a). The second case consists of businesses that also are in the impact area, but have moderate vulnerability. Such businesses—large manufacturers, for example—experience a larger initial drop in their sales levels and their recovery takes a longer time (Figure 11-7b). Tourism oriented businesses may also suffer initial losses and take some time to recover to their prior level of profitability because they may be stigmatized in the aftermath of a disaster and can take several seasons to shed the image of danger and destruction.

By contrast, the third case consists of businesses that experience initial sales losses because they are inside (thus experiencing direct losses) or near (thus experiencing indirect losses) the impact area. However, they later experience an increase in demand for their products/services during disaster aftermath (Figure 11-7c). Recovery–related businesses in the building construction, construction materials, and hospitality (e.g., hotels and restaurants) industries exemplify a pattern in which an initial loss (e.g., due to minor damage or infrastructure disruption) is rapidly restored and followed by increased sales. The final case describes recovery related businesses that are just outside the impact area. Not only do they avoid any initial losses, but they also can take advantage of expanded demand in the disaster stricken community and reap gains in the aftermath of the disaster (Figure 11-7d).

Although the available data are limited, some of these principles are revealed in data from business recovery in two communities affected by Hurricane Andrew (Dash, et al., 1997). Homestead had a larger population, a higher per capita income, and a higher average home value than Florida City. Homestead was 42% Anglo and 35% Hispanic, whereas Florida City was 61% Black and 37% Hispanic. Even though Florida City is slightly farther from the point at which the hurricane eye made landfall, there was essentially no initial difference in the hurricane’s impact on the two city’s businesses. The overall commercial property loss after the hurricane was 29% in Homestead and 32% in Florida City. However, Table 11-5 describes the business impacts of the hurricane in terms of the changes in the number of businesses, number of employees, and sales volume in each of the industries operating in these cities.

Overall, there were significant differences in the two communities over the next year. For example, total sales volume declined 83% in Florida City but only 1.1% in Homestead. However, inspection of Table 11-5 reveals that there are distinct differences from one industry to another and the magnitude of the impact depends on whether one examines the change in the number of businesses, the number of employees, or sales volume. For example, Florida City shows dramatic declines for agriculture on all three indicators but no change or even modest increases in construction. By contrast, Homestead showed a slight increase in the number of agricultural businesses, but significant increases in the number of agricultural jobs and sales volume. Moreover, it experienced significant declines for all three indicators in construction—almost the opposite pattern of Florida City. These differences in business impacts indicate local authorities should carefully assess the businesses in their communities before a disaster strikes and monitor their economic viability in the disaster’s aftermath to determine if government intervention is needed.

# The Role of State and Federal Governments

State and federal agencies can play significant roles in disaster recovery, but the burden most frequently falls on local governments because only about 19% of all disasters receive state disaster declarations and 1% qualify for Presidential Disaster Declarations (PDDs). Thus, local governments should prepare to undertake a variety of functions during a disaster recovery process, understanding that they might not receive any aid from higher levels of government for minor disasters. The main factor affecting the level of involvement of state and federal government is the scope of the event. After a major disaster, a PDD opens a broad range of programs for relief and reconstruction. In such cases, the state plays a coordinating role, working with both federal and local governments. Moreover, disaster response might be mostly over before the PDD is granted, but federal assistance is certainly welcome when it finally arrives. The Recovery Function Annex of the National Response Plan of January 2003, available on the DHS Web site (www.dhs.gov/dhspublic/), lists 71 federal disaster recovery programs that are administered directly by the DHS or by dozens of other federal and volunteer organizations. The following discussion is not exhaustive, but gives an overview of some of the key programs.

**Table 11-5.**Changes in the Number of Businesses, Employees, and Sales Volume after Hurricane Andrew.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Businesses Change (%) | | Employees Change (%) | | Sales Volume Change (%) | |
| Industry | Florida City | Homestead | Florida City | Homestead | Florida City | Homestead |
| Agriculture | -71 | +4 | -92 | +74 | -93 | +66 |
| Construction | 0 | -20 | +12 | -20 | +12 | -59 |
| Manufacturing | 0 | -12 | -67 | -19 | -59 | -32 |
| Transportation/  communication | -50 | +9 | -100 | +4 | -26 | +51 |
| Wholesale trade | -60 | -4 | -50 | +6 | -84 | +57 |
| Retail trade | -64 | -2 | -84 | +16 | -84 | -5 |
| Finance/  insurance/real estate | -20 | 0 | -59 | -1 | -32 | -32 |
| Business services | -63 | +6 | -94 | -5 | -65 | -14 |
| Professional services | -45 | -3 | -73 | +16 | -69 | +1 |
| Public administration | -50 | +38 | -69 | +7 | n/a\* | n/a\* |

Source: Dash, et al. (1997), Sales volume is not applicable to public sector organizations.

The lead agency at the federal level is FEMA, renamed the Emergency Preparedness and Response Directorate when it was placed in the new Department of Homeland Security in 2002. Other federal agencies might be called upon when a PDD is granted, including the Small Business Administration, the US Army Corps of Engineers, the Department of Housing and Urban Development, the National Oceanographic and Atmospheric Administration, and the Economic Development Administration, among others. Each of these agencies funds specific disaster recovery programs.

The National Response Plan provides for the establishment of Disaster Field Offices (DFOs) in the vicinity of the disaster. Emergency Response Teams (ERTs) are located in the DFOs. These include an Operations Section that coordinates federal, state, and voluntary efforts. The ERT Operations Section has a Human Services Branch that is responsible for many tasks including needs assessment; establishment of Disaster Recovery Centers; initiation, coordination, and delivery of recovery programs authorized by the Stafford Act; and managing DHS and state grant programs. Finally, there is an Infrastructure Support Branch to facilitate restoration of public utilities and other infrastructure services. There is also a Deputy Field Coordinating Officer for Mitigation who coordinates with the Infrastructure Support Branch and otherwise promotes mitigation and preparedness activities.

The main types of programs providing recovery assistance are Individual Assistance, Infrastructure Support (formerly Public Assistance), and Hazard Mitigation Grant Program. Individual Assistance is available to households through the Temporary Housing Assistance program, Individual and Family Grants, Disaster Unemployment assistance, legal services, special tax considerations, and crisis counseling programs. Individuals and businesses can receive aid through the Small Business Administration Disaster Loans program, which can provide loans for repairs to housing and businesses, and also for operating expenses. In the past, many loan programs have been inaccessible to low income households, which tend to rent rather than own their housing. Thus, they failed to qualify for loans because of their low incomes and lack of collateral. The Individual and Family Grant Program was intended to fill the need for a program targeting those whose needs were not being met by the SBA loan program, private insurance, or NGO assistance. However, the amounts awarded tend to be small.

Public Assistance programs offered through the Infrastructure Support Branch are targeted at state and local governments, certain nonprofit organizations that provide emergency services, and Indian tribes. These programs provide funds for the repair or replacement of public facilities damaged by disaster. They may be classified as Emergency Work under Category A (Debris Removal) or Category B (Emergency Protective Measures) or Permanent Work, under Category C (Roads and Bridges), Category D (Water Control Facilities), Category E (Buildings and Equipment), Category F (Utilities), or Category G (Parks, Recreational Facilities, and Other Items).

Assistance provided under the Hazard Mitigation Grant Program has increased in importance since the passage of the Disaster Mitigation Act of 2000. This legislation requires local governments to identify potential mitigation measures that could be incorporated into the repair of damaged facilities in order to be eligible for pre- and postdisaster funding. This policy represents a significant shift from previous FEMA policies that inhibited the implementation of mitigation measures because repairs were only funded to the level of predisaster conditions. The recent shift is putting more emphasis on activities eligible under Section 406 of the Stafford Act, known as *406 mitigation.* These activities include hazard mapping, mitigation planning, development of building codes, development of training and public education programs, establishing Reconstruction Information Centers, and assisting communities to promote sustainable development.

State governments vary widely in the level of attention and resources they devote to planning for and implementing disaster recovery. Some states have established programs providing assistance to households and local governments for recovery from disasters that do not receive a PDD. In order to support these programs, some states have created state disaster funds and designated several state level departments to provide resources and expertise that are available during recovery. One example is a state planning or community development department, which can provide data or guidance on integration of sustainable development and recovery. Other examples are state environment departments, which might have coastal management programs or water quality programs, and state economic development agencies, which might administer Community Development Block Grants that can fund repairs to low income housing.

States can fund their programs through the creation of state disaster funds, but only about half of the states have done so. Typically, state legislatures have appropriated funds after disasters on the basis of need. Another type of disaster fund is a disaster trust fund, which creates revenue by dedicating a percentage of sales taxes or other revenues to the fund. For a more detailed discussion of federal and state disaster recovery programs, see Smith (2004).

**The Role of Hazard Insurance**

As noted in Chapter 7, hazard insurance is a preimpact recovery preparedness action. As such, it has the potential for completely replacing current programs of disaster relief. In addition, hazard insurance decreases government workload and expense after disasters by shifting part of the administrative burden for evaluating damage to insurance companies in the private sector. Finally, hazard insurance defines the terms of coverage in advance, thus reducing opportunities for politicians to increase benefits after disaster. The desire to appear to be generous creates a temptation to vote for “pork barrel” projects. The problem is that generous aid for uninsured victims angers those who had the foresight to purchase insurance in advance and, thus, provides a disincentive to purchase insurance in the future.

Unfortunately, the potential contribution of hazard insurance remains to be fully realized. There are many difficulties in developing and maintaining an actuarially sound hazard insurance program. The National Flood Insurance Program has made significant strides over the past 30 years, but it continues to require operational subsidies. One of the basic problems is that those who are most likely to purchase flood insurance are, in fact, those who are most likely to file claims (Kunreuther, 1998). This problem of *adverse selection* makes it impossible to sustain a market in private flood insurance. The federal government has tried to solve this problem by requiring flood insurance for structures located in the 100 year flood plain that are purchased with federally backed mortgages. Unfortunately, homeowners frequently allow their policies to lapse after the first year and the program has no effect on those who purchase their homes without a mortgage or have paid off their mortgages. Consequently, some homes are rebuilt soon after a disaster because their owners have high quality insurance coverage, whereas other homes take much longer because they are only partially insured. In some cases, the homeowners lack *any* insurance because they cannot afford quality insurance or were denied access to it because of “redlining” (Peacock & Girard, 1997).

In addition to these institutional problems, there are cognitive obstacles to developing a comprehensive hazard insurance program. Building on earlier hazards research (see Burton, et al., 1993, for a summary) and psychological research on judgment and decisionmaking (see Slovic, et al., 1974, for an early statement and Baron, 2000, or Gilovich, Griffin & Kahneman, 2002, for more recent summaries), researchers have identified numerous logical deficiencies in the ways people process information in laboratory studies of risk.

One important issue concerns what economists call moral hazard and psychologists refer to as a felt lack of personal responsibility for protection. The concept of moral hazard/felt responsibility for personal protection has important policy implications because the Interagency Floodplain Management Review Committee (1994) report concluded federal disaster relief policy creates this condition by relieving households of the responsibility for providing their own disaster recovery resources. This might be a significant reason why only 20% of structures affected by the 1993 Mississippi floods were insured. However, there appears to be no data on the extent to which households explicitly consider the availability of disaster relief in making decisions about whether to purchase hazard insurance and adopt other hazard adjustments.

**Non Governmental Organizations and Community Based Organizations**

The role of NGOs such as the American Red Cross, Salvation Army, and Mennonite Disaster Service is widely publicized and the role of CBOs such as local churches and service organizations is increasingly recognized. These organizations provide housing, food, clothing, medicine, and financial assistance to disaster victims. In most cases, the *existing* government social service agencies are supplemented by NGOs that *expand* their membership to perform the tasks they are expected to perform during disaster recovery (Dynes, 1970). By contrast, existing CBOs typically *extend* themselves beyond their normal tasks to perform novel activities. In addition, there are situations in which existing, expanding, and extending organizations cannot successfully meet the recovery needs of disaster victims. In such cases, government agencies, NGOs, and CBOs form an *Unmet Needs Committee,* which is an *emergent* organization that is designed to serve those whose needs are not being addressed by existing programs.

In some cases, the need for such emergent organizations arises from political organization and activism by population segments that believe they are being neglected (Morrow & Peacock, 1997; Phillips, 1993a). Local authorities should anticipate recovery demands, plan for an *Unmet Needs Committee,* and communicate its existence throughout the community. When emergent organizations do arise, they can be incorporated into the ongoing recovery management process in order to learn from their knowledge about the unmet needs and ensure that there is an equitable distribution of disaster recovery resources. For a more detailed discussion of NGO activities in disaster recovery, see Smith (2004).

# Local Government Recovery Functions

After a disaster, local government needs to perform many tasks very quickly, and many of these must be performed simultaneously. It is therefore critical to plan for disaster recovery, as well as for disaster response (Schwab, et al., 1998). The line between emergency response and disaster recovery is not clear because some sectors of the community might be in response mode while others are moving into recovery, and some organizations will be carrying on both types of activity at the same time. This means that there will be little time to plan for disaster recovery once the emergency response has begun. By planning for recovery before disaster strikes, resources can be allocated more effectively and efficiently, increasing the probability of a rapid and full recovery. The following discussion is based on the concept of preimpact planning for disaster recovery because a lack of planning will delay decisions about the allocation of recovery resources and the procedures by which they will be used. A lack of preimpact planning can also increase the probability of conflicts arising due to competition over scarce resources during the recovery period.

The previous sections of this chapter have described the tasks that households and businesses perform during disaster recovery and the resources they use to implement this recovery. When households and businesses lack the knowledge of how to recover or the resources needed to recover, government can provide assistance. Local government must also perform specific tasks during disaster recovery, some of which involve restoring services it performed before the disaster (e.g., providing functioning roads, street lights and signs, and traffic control devices). In addition, local government must rebuild any critical facilities (e.g., police and fire stations) that were damaged or destroyed. Finally, local government has a heightened need to perform its regulatory functions regarding land use and building construction. These two functions require rapid action under conditions of a greatly multiplied workload, so special provisions are required to expedite the procedures for reviewing and approving the (re)development of private property.

In approaching the task of preimpact recovery planning, a community must overcome three major misconceptions about disaster recovery. The first misconception is that the entire recovery effort can be improvised after the emergency response is complete. In fact, a timely and effective disaster recovery requires a significant amount of data collection and planning that will delay the recovery if they are postponed until after the emergency response is over. It is important to recognize that the disaster response phase’s uncertainty and urgency about human safety has been replaced by households’ and businesses’ urgency to return to normal patterns of functioning and government agencies’ uncertainty about how to organize the community to accomplish this.

The second misconception is that there will be ample time to collect data and plan the recovery during the emergency response. It is true that some recovery relevant data must be collected during the emergency response. However, an assessment of “lessons learned” from the disaster impact should be used to guide a recovery process that has been designed before the disaster strikes. Finally, the third misconception is that the objective of disaster recovery should be to restore the community to the conditions that existed before the disaster. As noted earlier, this will simply reproduce the community’s existing disaster vulnerability.

In many ways, the process of preparedness for disaster recovery is quite similar to the process of preparedness for emergency response. Thus, the community should establish a Recovery/Mitigation Committee before disaster strikes that will establish a vision of community disaster recovery and articulate the basic strategies that will be implemented before and after disaster impact. In addition, the committee should assign each recovery function to a specific organization, develop a Recovery Operations Plan (ROP), and acquire any necessary resources to implement it. Finally, the committee should conduct the training and tabletop exercises needed to ensure the ROP can be implemented effectively.

*The Recovery/Mitigation Committee*

The LEMC’s Recovery/Mitigation Committee can be an important part of an effective, rapid disaster recovery process. As noted in Chapter 3, this committee should be established before a disaster during the preimpact recovery planning process. Personnel should be designated to serve on this committee, including a chairperson and a lead agency, usually the local planning department. The jurisdiction’s Chief Administrative Officer, usually the city mayor or the county executive, should publish a planning directive, and the Recovery/Mitigation Committee chairperson should establish a planning schedule. Many government agencies should participate in the Recovery/Mitigation Committee, including the directors of the local planning, building, public works, engineering, parks and recreation, economic development, finance, housing, and social services departments, as well as the jurisdiction’s PIO (Schwab, et al., 1998). In addition, there should be representatives from local utility companies, other local business organizations, religious and charitable organizations, and representatives of neighborhood associations.

The Recovery/Mitigation Committee should examine the findings from the community HVA to identify the locations having the highest levels of hazard exposure, physical vulnerability, and social vulnerability. The committee should begin to work with the rest of the community, and especially with those at greatest risk, to formulate a vision of the disaster recovery it intends to implement.

Next, the committee should develop an ROP that integrates the likely disaster impacts, community goals, and public and private sector capabilities within the community. In addition, the ROP should identify external sources of assistance (federal, state, NGO), recognize their loan/grant requirements, and integrate these into a comprehensive program of disaster assistance. The committee should also develop a financial plan for responding to the disaster. Bolin (1993) reported that city revenues from a heavily damaged central business district were 5% of total revenues before the earthquake, declined sharply in the year after the earthquake, and took about four years to return to previous level. This clearly affects the jurisdiction’s tax revenues.

Moreover, the committee should establish agreements with NGOs and CBOs (especially local churches, neighborhood associations, and other citizens’ groups) for support in disaster recovery because these organizations provide financial and in-kind support, as well as legal and technical assistance. After a disaster strikes, the Recovery/Mitigation Committee should ensure that organizations respond within the scope of their responsibilities to implement the ROP.

*Envisioning a Community Recovery Strategy*

The Recovery/Mitigation Committee needs to work with the community before and after a disaster to articulate a vision of community disaster recovery. The recovery process needs to strike a balance between corporate centered and community based economic development (Bingham, 2000). According to a *corporate centered economic development*, usually advocated by the local business community, government provides resources such as land and money to the private sector to invest without any restrictions. This market based strategy tends to produce results that are good in aggregate but produces an inequitable recovery. By contrast, *community based economic development* involves active participation by government to ensure that the benefits of recovery will also be shared by economically disadvantaged segments of the community.

The short term recovery following a major disaster can generate an economic boom as state and federal money flows into the community to reconstruct damaged buildings and infrastructure. These funds are used to pay for construction materials and the construction workforce and, to the extent that the materials and labor are acquired locally, they generate local revenues. In addition, the building suppliers hire additional workers and these, along with the construction workers, spend their wages on places to live, food to eat, and entertainment. Unless there are undamaged communities within commuting distance that can compete for this money, it will all be spent within the community.

Communities must also consider the long term economic consequences of disaster recovery. What will happen after the reconstruction boom is over? They can attract new businesses if they have a skilled labor pool and good schools—especially colleges whose faculty and students can support knowledge based industries. Other assets include low crime rates, low cost of living, good housing, and environmental amenities such as mountains, rivers, or lakes (Blakely, 2000). A community can also enhance its economic base if it can attract businesses that are compatible with the ones that are already there. Such firms can be identified by asking existing firms to identify their suppliers and distributors. These new firms might be attracted by the newer buildings and enhanced infrastructure that has been produced during disaster reconstruction.

If a disaster stricken community does not already have such assets, they can invest in four fundamental components of economic development—locality development, business development, human resources development, and community development. *Locality development* enhances a community’s existing physical assets by improving roads or establishing parks on river and lakefronts. *Business development* involves efforts to retain existing businesses or attract new ones. Although it is not easy, this can be accomplished working with businesses to identify their critical needs. In some cases, this might involve establishing a business incubator that allows startup companies to obtain low cost space and share meetings rooms. *Human resources development* expands the skilled workforce, possibly through customized worker training. Finally, *community development* utilizes NGOs, CBOs, and local firms that will hire current residents of the community whose household incomes are below the poverty level. For example, a comprehensive program for developing small businesses, affordable housing, community health clinics, and inexpensive child care can help to eliminate some of what new businesses might consider to be one of the risks of relocating to the community.

*Developing a Recovery Operations Plan*

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| *Disaster Assessment* |  |
| Rapid assessment | Victims’ needs assessments |
| Preliminary damage assessment | “Lessons learned” |
| Site assessment |  |
| *Short Term Recovery* |  |
| Impact area security | Emergency demolition |
| Temporary shelter/housing | Repair permitting |
| Infrastructure restoration | Donations management |
| Debris management | Disaster assistance |
| *Long Term Reconstruction* |  |
| Hazard source control and area protection | Infrastructure resilience |
| Land use practices | Historic preservation |
| Building construction practices | Environmental recovery |
| Public health/mental health recovery | Disaster memorialization |
| Economic development |  |
| *Recovery Management* |  |
| Agency notification and mobilization | Public information |
| Mobilization of recovery facilities and equipment | Recovery legal authority and financing |
| Internal direction and control | Administrative and logistical support |
| External coordination | Documentation |

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| Damage Assessment | Routine Construction Cost Estimation |
| Rapid Damage Assessment |  |
| Preliminary Damage Assessment |  |
| Site Assessment | Preliminary Cost Estimate |
|  | Detailed Cost Estimate |