Chapter 2

THE DISASTER RECOVERY PROCESS

Disaster recovery is viewed by some people as a fight against Mother Nature to restore order in a community. However, the disaster recovery *process* is *not* a set of orderly actions triggered by the impact of a disaster upon a community. Rather, disaster recovery is a set of loosely related activities that occur before, during, and after a disastrous event. These activities can include:

- warning and ongoing public information
- evacuation and sheltering
- search and rescue
- damage assessments
- debris clearance, removal and disposal
- utilities and communications restoration
- re-establishment of major transport linkages
- temporary housing
- financial management
- economic impact analyses
- detailed building inspections
- redevelopment planning
- environmental assessments
- demolition
- reconstruction
- hazard mitigation and
- preparation for the next disaster.

When disaster strikes, response activities and recovery activities are often uncoordinated, occur concurrently and, on occasion, overlap or conflict with one another. Often, management responsibility for these activities will be assigned to people unfamiliar with them. Decisions affecting community welfare—some of which may have long-lasting impacts—will have to be made under intense pressure and scrutiny, and it will be impossible to take into account the views of all the pertinent stakeholders. One consequence is that the community may miss opportunities to improve its infrastructure, economy, environment, or quality of life.

The ideal disaster recovery *process* recognizes the possibilities of the situation, and manages the necessary activities so that they are solutions, not additional problems. A community should strive to fully coordinate available assistance and funding while seeking ways to accomplish other community goals and priorities, using the disaster recovery process as the catalyst.

This *ideal* disaster recovery process is one where the community proactively manages:

- Recovery and redevelopment decisions to balance competing interests so constituents are treated equitably and long-term community benefits are not sacrificed for short-term individual gains;

- Multiple financial resources to achieve broad-based community support for holistic recovery activities;
- Reconstruction and redevelopment opportunities to enhance economic and community vitality;
- Environmental and natural resource opportunities to enhance natural functions and maximize community benefits; and
- Exposure to risk to a level that is less than what it was before the disaster.

This ideal disaster recovery process is consensus-based and compatible with long-term community goals, and takes into account all the principles of sustainability described in Chapter 1. It will have both immediate and lasting impacts that are self-supporting, and will make a community better off than before. It is a *holistic disaster recovery*. Holistic disaster recovery is becoming the next step in a logical progression. If we include sustainability within the multi-objective mitigation we already incorporate during disaster recovery, it can become equally accepted and equally successful. Holistic disaster recovery *does not differ* from "normal" disaster recovery—it is *part* of what should be "normal" disaster recovery. A "good" recovery *is* a holistic recovery—one that considers the community's best interests overall, by including the principles of sustainability in every decision.

The question is, "How does one make a holistic disaster recovery happen?" How can a decisionmaker reshape a process that operates within an emotional, reactionary, time-sensitive, expensive, and politically charged atmosphere that is based upon incomplete information, disproportionate needs, and the worst working conditions imaginable?

There are two important steps to get a community started. The first is identifying and understanding the obstacles that prevent a holistic disaster recovery from occurring. Second, a community needs to form and adopt new strategies, including the holistic disaster recovery framework and process, that coordinate, lead, and manage post-disaster decisions in a way that starts to overcome these obstacles.

GETTING STARTED: PLANNING FOR DISASTER RECOVERY

Disaster recovery actually begins *before* a disaster occurs. Emergency managers refer to this as *preparedness*—that phase during which people get ready for the onslaught and aftermath of disaster with activities such as warning, evacuation, and sheltering. In disaster-prone regions, it is even common for debris removal, utility restoration, and the management of donations and volunteers to be preplanned. These pre-disaster activities have a dramatic impact upon a community's ability to respond to, and recover from, a disaster.

A community's response to a disaster lays the groundwork for both short-term and long-term recovery. For example, to re-establish power quickly, downed lines are often immediately re-strung on the poles, rapidly re-established the pre-existing risk with little or no thought as to why the power lines came down (quite often because trees fell across them) or why the poles

themselves failed (were they blown down, broken by wind, or undermined by erosion?). An opportunity has thus been missed to "underground" the power lines to protect from future similar events or improve aesthetics. By studying some of the mitigation options before disaster strikes a community is better prepared for recovery. Decisionmaking could take place in a less-fettered environment, with appropriate funding, public input, and cost-benefit analysis.

If a community fails to adequately respond to a disaster, its credibility suffers. This loss of credibility can become a barrier to implementing a holistic disaster recovery. If a local government cannot re-establish power quickly, or clear the roads of debris from an event that they "should have known" would occur sooner or later, then how can that same government expect its constituents to believe in its ability to manage more complex long-term recovery issues?

Communities that are serious about disaster recovery tend to focus first on improving response activities (warning, evacuation, power restoration, debris management) before the more advanced concepts of holistic recovery. In the immediate post-disaster period, people often think that mitigation activities may not work, or that coupling community improvements with repairs may be too expensive, too disruptive, or take too long. Unfortunately, it is within this same time frame that decisions affecting repairs and restoration are made, and thus the opportunity to integrate the principles of sustainability into the recovery process is lost.

Holistic disaster recovery is about change. Because the disaster recovery process begins before the disaster, the best chance to foster post-disaster change is to include sustainability issues in local pre-disaster planning. The six principles of sustainability can be integrated into post-disaster plans, but there is a better chance for implementation—because of timing and a less-pressured decisionmaking environment—if they are addressed beforehand. This concept has been called pre-event planning for post-event recovery (PEPPER) first advanced in the 1980s (Spangle, 1987).

Planning for Recovery

In 1981, Nags Head, North Carolina, began addressing its severe exposure to coastal storms and subsequent erosion by developing a post-disaster recovery plan that included a Recovery and Reconstruction Task Force *with identified pre- and post-disaster responsibilities,* including building moratoriums and reconstruction priorities and guidelines. The controversial nature of this effort is best demonstrated by its 1989 adoption date, *eight years* after discussions were initiated.

In 1990-91, Hilton Head, South Carolina, developed its Pre-Disaster Recovery & Mitigation Plan as a means of avoiding the similar controversies its neighboring communities faced while recovering from Hurricane Hugo in 1989. Over the next decade, Hilton Head wisely focused its efforts on stormwater and floodplain management, which posed more frequent and disruptive problems than the occasional major hurricane.

In communities that endure repeated disasters, *after* one disaster is the same as *before* the next. Thus, the increased awareness created by the last disaster can provide impetus for pre-disaster planning for the next one, including the opportunity to incorporate sustainability in the next recovery.

RECOGNIZING SHORT-TERM AND LONG-TERM DISASTER RECOVERY

Usually, communities think of preparing for a disaster *before* its onset, and response and recovery as activities for *after* the disaster. However, sometimes communities do respond before disaster happens. For example, in predictable events, like slow-rise riverine flooding or most hurricanes, there is time to notify people of the impending danger, take some protective measures, and evacuate safely. Response actions are taken before anything happens. Doing so lessens the need to respond further, and lessens some of the elements of short-term recovery that might otherwise be necessary.

Traditional, post-event disaster recovery occurs in phases—short-term and long-term.. Search and rescue, damage assessments, public information, temporary housing, utility restoration, and debris clearance are essential elements of short-term recovery. How they occur will affect how some longer-term decisions are made (or not made).

Long-term recovery begins when a community starts to repair or replace roads, bridges, homes, and stores. It is also the period where improvement and changes for the better such as strengthening building codes, changing land use and zoning designations, improving transportation corridors and replacing “affordable housing” stock are considered. Whether they are considered during pre-disaster planning or short-term post-disaster recovery, it is during the long-term recovery period that most changes in pre-existing conditions can and do occur. Changes that include sustained efforts to reduce loss of life and property from the next disaster, such as changes to building codes and land use designations are examples of mitigation (discussed in more detail in Chapter 8). Changes such as improving traffic circulation or supplementing affordable housing units are examples of improvements in a community’s quality of life (see Chapter 4), and there are many other kinds of changes that can take place during long-term recovery.

Different Perspectives on Disaster Recovery

It is important to recognize that not everyone within a community will have the same perspective or understanding of disaster recovery. The issues discussed thus far are presented from a “community recovery” point of view, that is, the activities that need to be managed in order for a local government to recover to an equal or improved state. However, there are also perspectives of the individual and of community economics that need to be taken into account.

The individual perspective is important because as a community starts its recovery, most people are recovering emotionally, and this takes place at a slower pace than the external, community recovery. Communities respond quickly, and with increasing resolve to re-establish utilities, provide access, and create reconstruction policies. Individuals experience a short period of cohesion during which people come together to help and comfort each other, followed by a longer period of disillusionment as personal, family, job, insurance and disaster assistance issues begin to take their toll. The result is that constituents and stakeholders that are subject to the decisions being made on their behalf are in “a different place.” This creates a “disconnect” between

community recovery and individual recovery that leads to frustration, misunderstanding, and disillusionment.

Eight months after a wildfire disaster, the Los Alamos County (New Mexico) government busily adopted changes to the location of utilities, zoning designations, and building codes. The residents affected by the fire, however, were becoming increasingly frustrated as disaster claims remained unresolved, code changes required reconstruction design modifications, utility restoration forced neighborhood roads to be dug up (complicating access and construction), and personal losses continued to become apparent. The County was acutely aware of these circumstances, however, and through concentrated and ongoing communications that made use of newsletters, "survivor" meetings, and the County website, minimized a difficult situation.

Similarly, there is an economic perspective that differs from both that of the community and the individual. It is this economic perspective that highlights the interrelationship and interdependency between local governments and the business community. Businesses, from small "mom-and-pop" to "big box" national chains, are primarily concerned with minimizing their down time. The businesses often reach out to their employees to help them recover as individuals, because they need them as employees to help manage the business recovery. People forced to stand in line for water and ice, insurance appointments, and disaster assistance find it difficult to return to work to help their "other family" at the same time.

There is also an increased reliance of business upon local government. Without access to their facility, or power and water to run equipment and bathrooms, their recovery is hindered. Conversely, the longer it takes for businesses to recover, the greater the problems for local government (unemployment, loss of sales taxes, loss of business services, etc.).

Everyone in the community has a stake in disaster recovery, and the differing perspectives and interdependencies of individuals, government and business can create conflicts over priorities and timing. Local politics can also become a barrier to the holistic recovery. It is important to recognize the differing perspectives and agendas in order to tailor recovery actions that address those needs as much as possible.

NINE OBSTACLES TO HOLISTIC RECOVERY

There are lots of obstacles to a successful recovery. Although they will not necessarily prevent a holistic recovery, they can slow the process down, and create sidetracks for the unaware. If they are ignored they can become barriers to achieving successful holistic recovery.

The degree of damage inflicted upon the community. After Presidential disaster declarations, programmatic funding rules and applicable codes and standards (building codes, infrastructure design standards) will drive the decisions to repair or replace the damaged facilities and affect a community's ability to make changes. When facilities require full replacement there are often more alternatives to correct poor decisions in the past than there would be if only slight repairs are needed.

MAXIMS FOR DISASTER RECOVERY

Disaster recovery is not easy.

The operating procedures of critical recovery agencies will be unfamiliar.
The community will be understaffed.
The issues will be complex, changing and fueled by competing interests.
There is never enough time.
There is never enough money.
Decisionmakers and their families will likely be victims themselves.

Disaster recovery will take years.

During the first weeks the community will address emergency actions.
During the first months it will address restoration of community services.
During the first months and for years thereafter it will address rebuilding, replacing and improving what was lost and addressing financial, political, and environmental issues.

Disaster recovery programs and procedures seem like "moving targets."

Disaster assistance policies are frequently changed, amended, or replaced.
Political interests often respond with additional, supplemental assistance.
Different programs from different agencies often don't mesh well.

There are many possible outcomes to disaster recovery.

Re-creating pre-disaster level of services and quality of life is not guaranteed.
Local, state and federal regulations define boundaries for recovery options.
Local leadership and "vision" are determinants of the recovery outcome.
There is a "silver lining." Many communities, in retrospect, feel their disaster was the catalyst for making many improvements through the recovery process that otherwise may never have occurred.

There is a lot of help available for disaster recovery.

Local decisionmakers do not need to re-invent the wheel.
Help is available from
- State and federal disaster officials
- Decisionmakers from other communities that have been struck by disaster
- Professional organizations (disasters, planning, engineering, service)
- Disaster recovery consultants.

Having experienced a disaster does not make a community immune.

If it happened once, it can happen again.
After one disaster is before the next. The community should start preparing for the next one.
Decisionmakers should learn from experiences, by evaluating what worked and what didn't.
Incorporating mitigation into disaster recovery protects a community from the next disaster.
Decisionmakers should share "lessons learned" and "successes" with others.

Rules, regulations, and policies. On the positive side, funding made available through government disaster relief programs provides the wherewithal to jump-start the recovery process. However, the rules, regulations, and policies that accompany the funding can often alter priorities, limit opportunities, and curtail creative solutions.

Other "money" issues, such as property rights, development, insurance, land use, and substandard housing. These broadly connected issues can affect how and when communities make recovery decisions. For example, after a flood, a community may identify an opportunity to enhance economic development, natural resource protection, and the quality of life by limiting redevelopment in certain areas. The idea of establishing a river-front park that combines flood loss reduction with a pedestrian/bicycle corridor and public access for picnicking, fishing, and boating is becoming commonplace. But communities are often surprised to discover that many owners of flooded homes not only want to return to their river-front vistas, but also intend to take the opportunity to replace the structures with larger, more modern units.

In other cases, damaged floodprone property often represents the least desirable housing in the community due to its location, repetitive damage, and decreasing property values. Here, otherwise unaffected property owners may choose to "fight" any redevelopment plan, arguing that government should not help those that knowingly chose that risk to begin with.

The propensity to strive for "a return to normal." Proposed post-disaster changes in land use, building codes, densities, infrastructure, property ownership, and redevelopment plans always take time. This is often seen as an unnecessary delay in what otherwise would be a recovery "back to normal," and can be an obstacle to utilizing recovery opportunities for community improvement. It is at this point that the concept of pre-disaster planning for post-disaster redevelopment makes the most sense to everyone involved. People say, "If we'd only figured this out *before* the disaster, it would be so easy to rebuild and recover to an improved state—but now, since this all takes so long, maybe we'd be better off if we just put things back the way they were. Then we can look at making plans for recovering from the next disaster if we still want to."

A lack of awareness of what the true redevelopment possibilities are. People are not aware of how other communities have made substantial community improvements by using a disaster to initiate the process. Others are more concerned with their own personal world than with the "bigger picture" of community betterment, and it is difficult to change their primary focus without significant pre-planning, coordination, leadership, political will, and some vision of an improved future.

The immediate change in the roles and procedures of local government officials. Post-disaster government roles, procedures, and priorities change, often requiring different mixes of skills than those to which officials are accustomed. Job functions change, workloads increase dramatically, and the work involves new players, new terminology, and even new structures, such as Incident Command or State Emergency Management Systems. Additionally, public scrutiny and political pressure reach new plateaus as local officials try to maintain the day-to-day functions that government normally provides.

Searching for the extraordinary solution to what appears to be an extraordinary problem. Most "extraordinary problems" are actually problems that governments deal with routinely: picking up debris, conducting building inspections, planning, permitting new development, managing grants and loans, and providing public information. The situation becomes extraordinary only because all these functions are happening at the same time, and with greater demands. Communities need to break down the problems into those that they are already accustomed to resolving, and then use the standard procedures to do so. Otherwise, the search for the extraordinary solution will only slow them down.

The lack of systematic communication between decisionmakers, various departments and agencies, and stakeholders. Communities can develop a mechanism that ensures that the principles of sustainability are incorporated into each and every decision faced every day by communities. There needs to be a comprehensive, on-going, systematic series of check-points at which every decision is weighed against its impact on hazard vulnerability, economic vitality, environmental preservation, quality of life, and social justice. Unless this occurs, few decisions are analyzed to the extent that their direct and indirect consequences can be foreseen.

The lack of political will to "do the right thing." Addressing the needs of those impacted by disaster and determining methods to prevent a recurrence are often goals unintentionally sacrificed for the lack of appropriate support. When public decisions are swayed by the immediacy of constituent needs, pre-existing conditions are often re-established. Local leaders must define a vision of the future, provide the direction to get there, and establish the priorities to make it happen. They must develop and create a will that is infectious among community politicians and constituents alike. Disaster recovery managers must juxtapose short-term and long-term community needs against the "quick and easy fix" or the perceived rights of select property owners. They must protect the health, safety, and welfare of the community from the desires, power, and influence of those who promote short-sighted solutions. They need to foster personal and community responsibility for recovery decisions that will affect their community for years to come.

SEVEN ENABLERS FOR HOLISTIC DISASTER RECOVERY

The key attributes and tools that have transformed hazard mitigation into a common post-disaster activity are leadership, ownership, vision, political will, mandates, incentives, and resources. These are the same ingredients that will enable communities to achieve holistic disaster recovery.

The concept of disaster recovery as helping communities replace what they had has evolved to mean helping communities prepare and protect themselves from enduring preventable, repeated losses. The Federal Emergency Management Agency (FEMA) helped fashioned this change by conditioning disaster assistance upon the requirement to undertake mitigation planning. Substantial financial and technical resources followed up this requirement to help implement the plans, and training on what to do and how to do it followed these resources.

Leadership has changed the way disaster recovery takes place. Community safety and betterment have become standard among post-disaster priorities. The Disaster Mitigation Act of 2000 and

federal initiatives like FEMA's Project Impact helped make these pre-disaster priorities. Incentives have stimulated communities to undertake the additional efforts required. Here are a few "enablers" for holistic disaster recovery, and how they might be utilized.

Stakeholder perception Be aware of every person, business, agency, and organization that may be affected by a potential decision and include them in the decisionmaking process. Some may benefit directly from the action being taken, while others may benefit from the multi-objective element of the action. For example, a detention pond that contains a playground within its boundaries may provide protection to some, and recreation opportunities to others. From a holistic recovery perspective, the detention pond may also contribute to improved water quality, wildlife habitat, and protect downstream businesses from being flooded. Build as wide a supporting constituent base as possible and include them in the decisionmaking process. (Participatory processes are discussed in Chapter 3.)

Political will is the willingness to analyze the issues, evaluate the alternatives, and protect the long-term public interest over short-term goals. It is the willingness to make the tough decision, to maintain the overall focus, and to get the job done.

Authority is the ability to use appropriate tools to support the needs of the community. Making development changes in a community can be difficult and controversial for those with the authority to implement change. Not having the state-empowered local authority to act (e.g., adopting land use measures) is one thing. Failure to act is another.

Funding. When funding was scarce, dollars that became available for recovery and redevelopment often drove the decisions about what to do. If it were a case of having funds to take one action, versus having no funds to do anything else, communities commonly took the one "eligible" action, often without a full evaluation of its impacts. Now, funding is more readily available, providing greater flexibility in community choices. This supports taking a preferred action but it also increases the need to undertake a comprehensive evaluation of the proposed action's intended and unintended consequences.

Priority allows a community to order its actions to maximize their outcomes. In holistic disaster recovery, establishing priorities allows communities to "double up" on other goals, e.g., affordable housing, access to recreation, or improved transportation corridors. Assigning a weighted decisionmaking factor capitalizes upon additional and non-traditional disaster recovery resources, while maintaining an overall implementation framework. This could range from deciding which actions to take in which order, to establishing other priorities. For example, many communities now recycle over 90% of their disaster debris. This not only eliminates replicating and draining resources, it greatly diminishes waste by keeping it from being landfilled.

Vision. It has been said that you can't get somewhere if you don't know where you are going! Creating a vision of where a community wants to "be" in the future provides direction that would be otherwise lacking in recovery from disaster. With a vision of the future, the community can use disaster recovery to reduce its pre-disaster vulnerability while improving overall quality of life and other aspects of sustainability.

Community endorsement. Community support or "buy-in" builds public expectations and confidence. Multiple benefits are difficult for people to perceive or accept, particularly if others obscure the one they are most interested in. Promoting multiple objectives and benefits broadens constituent support.

PLANNING FOR HOLISTIC RECOVERY

Holistic disaster recovery is not going to occur by itself. In the ideal disaster recovery, a community's goals for economic development environmental protection, disaster resilience, and other issues would have been coordinated through comprehensive planning that was done ahead of time. There are several ways for a community to do this.

Comparing Planning Approaches

Experience has demonstrated that a key to successful hazard mitigation is multi-objective planning. The multi-objective opportunities commonly identified during hazard mitigation planning resemble the principles of sustainable development and "smart growth," the name given to state-of-the-art community planning strategies. Planning—whether it be for "smart growth," sustainable development, or hazard mitigation—adopts similar goals, takes similar approaches, and faces similar barriers. Below are listed the principal elements of each of these three community planning approaches.

Three Approaches to Community Planning

Sustainability	**Hazard Mitigation**	**Smart Growth**
Quality of Life	Planning	Comprehensive planning
Economic vitality	Avoidance	Compact urban areas
Social & intergenerational equity	Strengthening	Mixed land use
Environmental quality	Conserving	Transportation options
Disaster resilience	Limiting	Staged infrastructure
Participatory process	Communication	Human-scale design
		Predictable development review

Recovery Planning during Recovery

The foregoing discussion assumes that a community either has enough foresight to pre-plan its recovery, or that it has been repetitively impacted to the extent that a real threat is perceived. Most often, though, communities begin their involvement with recovery planning after a disaster.

Most communities complete their recovery and mitigation plans in the post-disaster setting by following FEMA's mitigation planning initiatives, requirements, and incentives. They are advised to follow what has become known as the "10-step mitigation planning process." This is the same planning process that is recommended in the guidance for the National Flood Insurance Program's Community Rating System, and also is recognized for some U.S. Army Corps of Engineers local flood control initiatives. The process is described in easy-to-understand detail, from a flood mitigation perspective, in *Flood Mitigation Planning: The CRS Approach*, by French Wetmore and Gil Jamieson, listed in the References list at the end of this chapter.

The 10-Step Process for Local Planning and Action

1. Get organized.
2. Involve the public.
3. Coordinate with other agencies, departments, and groups.
4. Identify the problem situation.
5. Evaluate the problem & identify opportunities.
6. Set goals.
7. Explore all alternative strategies.
8. Plan for action.
9. Get agreement on the action plan.
10. Implement, evaluate, and revise.

Even if the community is not preparing a formal recovery plan, the 10-step process is a useful guide to action. Holistic disaster recovery can be incorporated into this process as follows.

In **Step 1—Get organized** the community can demonstrate its commitment to the process through the resources it provides for the planning process. This is where the holistic disaster recovery concept can be introduced, by encouraging appropriate staff and citizen input that reflects the principles of sustainability: environment, economic development, and disaster resilience.

In **Step 2—Involve the public**, the sustainability principle of using a participatory process is readily addressed by including the stakeholders directly. See Chapters 3 and 6 for more discussion of who to include and how to do it.

In **Step 3—Coordinate with other agencies, departments, and groups** a community can expand representation on the central recovery committee or task force to include those who can contribute expertise on each of the principles of sustainability. This could include state or local parks or wildlife departments, economic development directors, the business community, or social services personnel, for example.

In **Step 4 —Identification of problems** the community is facing, and **Step 5—Evaluate the problems** that conditions cause are described. Recovery team members should consider how the potential impacts might affect economic activities, natural resources, the overall quality of life,

and people of different ages, races, and economic status. The team should also adopt a long-term viewpoint so that intergenerational equity is considered.

In **Step 6—Goals and objectives** are developed. The recovery team can use the Matrix of Opportunities presented in Chapter 1 to identify and incorporate short- and long-term recovery issues into the evolving plan. Coordination with other community plans and programs at this point can combine disaster recovery issues with existing comprehensive, development, capital improvement, drainage, transportation, housing, and recreation plans. Multiple-objective opportunities give the community the opportunity to establish a coordinated recovery that maximizes available technical and financial recovery resources with pre-planned community goals and objectives.

In **Step 7—Explore all alternatives**, the recovery team reviews the options and tools available to achieve the selected goals and objectives. As part of this review, the six principles of sustainability are included among the criteria that assist the team in deciding which actions to take and in which order. The criteria should clearly identify proposed actions that support sustainability as having high community value. The recovery team needs to be sure that the actions agreed upon do not undermine any of the aspects of sustainability. This step becomes the true litmus test for choosing activities that will help integrate sustainability into the community during its recovery.

Finally, in **Steps 8, 9, and 10, a plan is written, adopted by the elected governing board, and implemented**. Attention to sustainability details in these final steps will set the stage for managing the recovery and ensuring that the community maximizes the opportunities that are created by disaster.

This process does not guarantee that every sustainability principle ends up being addressed in the recovery, but including the principles as decisionmaking criteria ensures that they will at least be considered. The rest of the chapters in this handbook give more details about how to incorporate different aspects of sustainability into the appropriate phases of the 10-step process.

MAKING SUSTAINABILITY PERMANENT

Disaster recovery provides the opportunity to introduce sustainability into a community. There are other ways, to be sure, but the dramatic nature of disasters, and the frequent need to rebuild what has been destroyed, provides an opportunity to substantially improve the character of the community in a manner that rarely presents itself otherwise. However, the principles of sustainability may provide solutions to other problems that exist or that the community may soon be facing. Why should a community wait for a disaster before it pursues sensible objectives?

Sustainability goes far beyond just being an innovative disaster recovery strategy. It can inject the rejuvenating life’s blood that so many communities desperately need today. Communities that need this kind of help should consider incorporating sustainability into all development decisions—not just post-disaster re-development.

The most effective way to incorporate sustainability into a community is through adopting a "natural hazards element" within a local comprehensive plan. Following this concept, and the framework for smart growth from which it was derived, would ensure that every development/redevelopment decision made, after a disaster or not, would be subject to the principles of sustainability. Holistic disaster recovery is really "sustainable redevelopment," which is a subset of a larger issue, sustainable development. As such, communities need to recognize that holistic disaster recovery is not the "end all," but rather one piece of the pie. Disaster recovery provides an opportunity to correct the unsustainable mistakes of the past. Disaster recovery is not, however, the driving force behind implementation of sustainability, nor should it be. Disasters are simply catalysts for change. The post-disaster "window of opportunity" is a time when past mistakes can be assessed, and drawing upon experience, try to demonstrate the way for the future.

Florida's 9J-5 rule requires a Disaster Recovery Element in every coastal county's Comprehensive Plan. While this has yet to be an overwhelming success in terms of its implementation rate, some counties, like Lee County, have taken the requirement seriously and attempted to implement some innovative strategies, such as proposing an Emergency Management Impact Fee to help offset the increased costs of warning, evacuation, and sheltering created by continued development, and proposing the use of the Transfer of Development Rights to create incentives for safer, more sustainable development. Unfortunately, some obstacles have prevented their implementation. On the other hand, this type of pre-disaster planning has set the stage for post-disaster recovery. Lee County, and many others like it nationwide, is only one disaster away from making "the right decisions" the next time.

REFERENCES

American Planning Association, 1994. *Growing Smart Legislative Handbook: Model Statues for Planning and the Management of Change*. Chicago, IL: APA.

Association of State Floodplain Managers, Inc. 1996. *Using Multi-Objective Management to Reduce Flood Losses in Your Watershed*. Madison, WI: Association of State Floodplain Managers, Inc. Abstract available at www.floods.org/PDF%20files/PUBSLIST.pdf. [accessed September 21, 2001]

Emmer, R. E. 1994. *Flood Damage Reduction and Wetland Conservation. Three Successful Projects in Louisiana have Common Characteristics*. Topical Paper #6. Madison, WI: Association of State Floodplain Managers, Inc. (September.) 23 pp.

Spangle, William E., ed. 1987. Pre-Earthquake Planning for Post-Earthquake Rebuilding (PEPPER). Los Angeles, CA: Southern California Earthquake Preparedness Project.

Wetmore, French and Jamieson, Gil. 1999. "Flood Mitigation Planning: The CRS Approach." *Natural Hazards Informer* 1 (July). Boulder, CO: Natural Hazards Research and Applications Information Center. Available at www.hazards.colorado.edu/hazards/informer/index.htm. [accessed September 21, 2001]

WHERE TO FIND MORE INFORMATION

Training Courses and Workshops

DRI International Education Program. (703) 538-1792; email driinfo@drii or www.dr.org/01sched2us.htm [accessed June 29, 2001]

- "Introduction to Business Continuity Planning." DRP-111.
- "Managing and Developing the Business Continuity Plan." DRP-112.
- "Implementing and Testing the Business Continuity Plan." DRP-113.
- "Crisis Communication, Coordination, Data Communications." DRP-114.

Federal Emergency Management Agency, Emergency Management Institute, National Emergency Training Center. Emmitsburg, MD. (301) 447-1035; www.fema.gov/emi [accessed June 15, 2001]

- "Introduction to Mitigation." Independent Study Course. Federal Emergency Management Course IS393.
  At the end of the course, the student should be able to: explain the rationale for mitigation and its function as a component of emergency management; define the principles, purposes, and priorities of mitigation; describe mitigation measures that are applicable to local hazard risk problems; summarize responsibilities and resources for mitigation; and outline mitigation planning considerations.

- "Integrated Emergency Management Courses for Specific Communities." Federal Emergency Management Agency Courses E930/S390, E931/S391, E932/S932.
  These courses place emphasis on community response and short-term recovery issues. They are tailored to fit the community and are based on a selected hazard type. The courses use classroom instruction, planning sessions, and exercises to allow for structured decisionmaking in a learning, yet realistic, environment. A key outcome is to assist with making the transition from response to short-term recovery. The three classes offered are: E930/S390 IEMC/Community Specific/All Hazards: Response and Recovery; E931/S931 IEMC/Community Specific/Hurricane: Response and Recovery; and E932/S932 IEMC/Earthquake: Response and Recovery.

- "IEMC/All Hazards: Recovery and Mitigation." Federal Emergency Management Agency Course E901/S901.
  This course emphasizes recovery and mitigation and is conducted for two types of audiences. The course places public officials and other key community leaders in a simulation that begins after a disaster has affected the community.

Federal Emergency Management Agency, Emergency Management Institute, National Emergency Training Center. Emmitsburg, Maryland. www.fema.gov/emi [accessed June 15, 2001] (301) 447-1035.

- "Mitigation and Recovery Exercises." Federal Emergency Management Agency Courses G398.1, G398.2, and G398.3.
  These are 1-day exercises for local building officials, zoning officers, commissioners, councils, and chief executive officers. The exercises provide a series of challenges to a local government that could face a threat from earthquake, flood, or hurricane. The local government will have to solve how it intends to deal with temporary housing issues, building permits, and temporary business locations as well as long-term recovery issues. Courses include: G398.1, Earthquake; G398.2, Flood; and G398.3, Hurricane.

- "Recovery From Disaster." Federal Emergency Management Agency Course E210.
  The resident version of this course is designed for local disaster recovery teams. These teams, consisting of emergency managers, elected city/county/parish administrators, public works directors, building inspectors, and community planners, are taught how to develop a disaster recovery plan. Participants are given the opportunity to develop their own recovery plan outline during the course.

Organizations

American Planning Association
The APA is a non-profit organization representing "30,000 practicing planners, officials, and citizens involved with urban and rural planning issues. Sixty-five percent of APA's members are employed by state and local government agencies." APA's mission is to "encourage planning that will contribute to public well-being by developing communities and environments that meet the needs of people and society more effectively." The website is an excellent source of books about community planning that incorporate the principles of sustainable development.

Through its *Growing Smart Legislative Handbook: Model Statues for Planning and the Management of Change*, the APA promotes the solution to overcoming the barriers of successful hazard mitigation and holistic disaster recovery. APA has developed a model "Natural Hazards Element" for local comprehensive plans. The model incorporates practices taken from numerous state statutes, combining them to create a mechanism whereby hazard mitigation, a stepping-stone for holistic disaster recovery, may be institutionalized.
See www.planning.org [accessed June 15, 2001]

Federal Emergency Management Agency
See "Response and Recovery" at http://www.fema.gov/r-n-r/ [accessed June 29, 2001] and

"After a Flood: The First Steps" at www.fema.gov/DIZAS/aftrfld.htm [accessed June 29, 2001]

Institute for Business and Home Safety. "Showcase Community Program."
The Institute for Business and Home Safety's Showcase Community Program has three objectives: 1) help a community help itself by reducing its vulnerability to hurricanes, earthquakes, tornadoes, wildfires, floods or whatever natural disasters threaten it; 2) generate a "me too" attitude among other communities by showcasing the successful efforts of particular jurisdictions: and 3) learn what works and what does not work to reduce the emotional and financial devastation caused by natural disasters.
See http://www.ibhs.org/ibhs2/html/ibhs_projects/projects_showcase.htm [accessed September 21, 2001]

Rothstein Catalog on Disaster Recovery.
This is a catalog of books, software, videos, and research reports that date to 1989.
See www.rothstein.com/catalog.html [accessed June 29, 2001]

Books, Articles, and Papers

Arnold, Christopher. 1993. *Reconstruction After Earthquakes: Issues, Urban Design, and Case Studies*. Palo Alto, CA: Building Systems Development, Inc. 170 pp.
After a major earthquake (1976) devastated the Chinese city of Tangshan, planners decided to build a new reinforced concrete city in a western style that was completely different from the masonry construction of the destroyed city. A visit to Tangshan five years after the quake provided an opportunity for the author to raise questions about the reconstruction process. What are the aspirations of those most closely connected to reconstruction planning? Can planners grasp and realize the opportunities for urban renewal presented by a seismic disaster? To what extent does the threat of future earthquakes dictate the urban design and construction of the new city? Why were cities in earthquake-prone areas so often repaired and rebuilt, when rational planning considerations might suggest that they be abandoned and rebuilt elsewhere? This study explores these questions and attempts to examine the reconstruction process from a qualitative rather than an administrative viewpoint. Most of the study is about city planning and urban design, utilizing five case studies to illustrate the author's perspective: Tokyo (1923 & 1945); Tangshan (1976); Spitak, Armenia (1988); and Santa Cruz, California (1989) .

Association of State Floodplain Managers (ASFPM). 1996. *Using Multi-Objective Management to Reduce Flood Losses in Your Watershed*. Madison, WI: Association of State Floodplain Managers. 72 pp.
This publication explores planning and implementation techniques for multi-objective watershed management. It provides a general introduction to multi-objective management and the planning process that helps a community select the flood-loss reduction measures most suitable to its situation. It explains how to define problems and goals, build partnerships, combine needs and solutions creatively, and begin formal implementation procedures. Both riverine and coastal flood watersheds are examined. Much of the document focuses on multi-objective management planning details, involving subjects such as fish and wildlife issues, water supply, housing improvement, transportation, and lifelines. Preparation of a multi-objective management plan involves problem definition, involvement of non-local groups, and public and official acceptance of the plan.

Bay Area Regional Earthquake Preparedness Project. 1990. *Putting the Pieces Together: The Loma Prieta Earthquake One Year Later*. Oakland, CA: Bay Area Regional Earthquake Preparedness Project. 253 pp.
This report grew out of a conference held to determine the lessons learned from the Loma Prieta earthquake and its aftermath. The conference examined preparedness and mitigation efforts before the quake, political and management issues of disaster response, recovery and reconstruction programs, and mitigation activities since the event. Among the numerous topics addressed in the volume, separate chapters are given to seismological and geological considerations, geotechnical aspects, the performance of lifelines, buildings, and transportation systems and the implications for future design of these elements, effective emergency management, emotional and psychological aftereffects, economic impacts, emergency public information and the media, the restoration of lifelines, emergency medical services, business recovery, and housing reconstruction.

Becker, William S. and Roberta F. Stauffer. 1994. *Rebuilding the Future–A Guide to Sustainable Redevelopment for Disaster-Affected Communities*. Golden, CO: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Center of Excellence for Sustainable Development. 18 pp.
This document summarizes why sustainability is important and gives an example of sustainable development in one community, Soldiers Grove, Wisconsin. The reader is walked step-by-step through the holistic recovery process. The last chapter discusses real-life problems that the planner may encounter. There is an appendix to the report with a comprehensive list of resources. This document is available online at www.sustainable.doe.gov/articles/RFTF1.shtml [accessed June 15, 2001]

Berke, Philip and David Godschalk. 1996. *Hazard Mitigation in California following the Loma Prieta and Northridge Earthquakes*. Natural Hazard Working Paper No. 14. Chapel Hill, NC: University of North Carolina, Center for Urban and Regional Studies. 59 pp.
This report documents a case study conducted almost six years after the Loma Prieta quake and one and one-half years after Northridge. The strengths and weaknesses of the California 409 Plans are identified, state and federal mitigation planning and implementation processes are reviewed, and local mitigation examples are drawn from San Francisco, Berkeley, Watsonville, and Los Angeles and Ventura counties. One finding was the present mitigation systems (policies

and institutions) will not be adequate to mitigate the impacts of a future major earthquake catastrophe. Two recommendations were that California should pursue a coordinated, interdisciplinary effort to further the understanding of earthquake prediction and of earthquake impacts and should reinvigorate efforts to mandate local multi-hazard mitigation planning before and after a disaster.

Comerio, Mary C., John D. Landis, Catherine J. Firpo, and Juan Pablo Monzon. 1996. "Residential Earthquake Recovery: Improving California's Post-Disaster Rebuilding Policies and Programs." *California Policy Seminar* 8(7) 11 pp.

Between 1989 and 1994, California suffered 13 presidentially declared disasters, including the Loma Prieta and Northridge earthquakes, leading to major concerns about the disaster recovery process. This report examines the current state of earthquake recovery practice in California, particularly as it relates to housing. The authors examine the complementary and overlapping roles of different federal, state, private, and nonprofit recovery and rebuilding institutions, as well as the distribution of post-Northridge rebuilding funds. They conclude that relatively little preparation has gone into coordinating and paying for postdisaster rebuilding, and that victims cannot expect private insurers or the federal government to compensate them at a level of assistance comparable to that following the Northridge quake. In particular, the authors conclude that linking earthquake mitigation, particularly residential retrofitting, to assistance holds significant potential for reducing rebuilding costs.

Federal Emergency Management Agency. 1997. *Framework for Federal Action to Help Build a Healthy Recovery and Safer Future in Minnesota, North Dakota, and South Dakota.* Washington, D.C.: Federal Emergency Management Agency.

This document identifies and explains the wide range of grants, loans, and technical assistance that the federal government can offer to ensure the recovery needs of people and communities. Although the document summarizes these programs for the states of Minnesota, North Dakota, and South Dakota, the descriptions are applicable to other areas recovering from flooding. Programs summarized include: comprehensive flood hazard mitigation; housing repairs, rehabilitation, reconstruction, and replacement financing; the National Flood Insurance Program; economic recovery programs; agriculture programs, infrastructure programs; health and mental health programs; and programs for special needs populations.

Federal Emergency Management Agency. 1999. *Federal Response Plan*. Washington, D.C.: Federal Emergency Management Agency.

This document is the principal organizational guide for defining the roles and responsibilities of the 26 federal member agencies and the American Red Cross that are engaged to deliver a broad range of emergency aid during a major crisis.

Federal Emergency Management Agency. 2000. *Rebuilding for a More Sustainable Future: An Operational Framework.* FEMA Report 365. Washington, D.C.: Federal Emergency Management Agency. Available at www.fema.gov/mit/planning_toc2.htm. [accessed September 21, 2001]

This document provides guidance to the Federal Emergency Management Agency (FEMA) Sustainability Planner in the post-disaster response and recovery process. State emergency management officials, local jurisdictions, and other FEMA staff may also use it as a reference during non-disaster time.

French and Associates, Ltd. and The Mitigation Assistance Corporation. 1994. *Post-Flood Recovery Assistance Plan. A Plan to Help Residents Recover from a Flood and Protect Themselves from Future Floods.* Arvada, CO: City of Arvada, Colorado, Department of Public Works, Engineering Division.

This plan was developed to guide the City of Arvada's actions to help residents after a flood, to assist them in both recovering from the damage and taking steps to protect themselves from future floods. It is based on successful strategies undertaken by other communities that have had similar flooding experiences.

Godschalk, David and Timothy Beatley. 1996. *Hazard Mitigation in Iowa Following the Great Midwest Floods of 1993*. Natural Hazard Working Paper No. 10. Chapel Hill, NC: University of North Carolina-Chapel Hill, Center for Urban and Regional Studies. 31 pp.

The report examines how the Stafford Act influenced recovery in eight localities in Iowa. Questions explored include: What constitutes mitigation? Who is in charge after a disaster occurs? What good is the 409 (Stafford) Plan? Who pays for disasters? Other topics considered include grant administration accountability, equity issues, the promotion of sustainable communities, and problems caused by confusing rules and guidance.

Mileti, Dennis S. 1999. *Disasters by Design*. Washington, D.C.: The Joseph Henry Press. 351 pp. Available at books.nap.edu/catalog/5782.html. [accessed September 21, 2001]

This book is a summary volume of the Second National Assessment of Research on Natural Hazards with the formal mission of summarizing what is known in the various fields of science and engineering that is applicable to natural and related technological hazards in the United States, and making some research and policy recommendations for the future. It summarizes the hazards research findings from the last two decades, synthesizes what has been learned, and outlines a proposed shift in direction in research and policy for natural and related technological hazards in the United States. *Disasters by Design* is intended for a general audience, including policy makers and practitioners.

Minnesota Department of Public Safety. *Recovery From Disaster Handbook*. St. Paul, MN: State of Minnesota. Available at www.dem.state.mn.us/publications/Recovery_Handbook/index.html [accessed July 23, 2001]

This handbook provides local units of government with guidance in long-term recovery after a disaster. The restoration process places great demands on government and the private sector. This manual will lessen the stress by providing answers and advice to many questions that arise from those who have dealt with recovery from disasters. Tool kits at the end of each chapter provide additional information specific to individual topics, some forms, and information to hare with the victims of the disaster as they recover.

Mittler, Elliott. 1997. *An Assessment of Floodplain Management in Georgia's Flint River Basin*. Boulder, CO: University of Colorado, Institute of Behavioral Science, Natural Hazards Research and Applications Information Center. 190 pp.

On July 3, 1994, Tropical Storm Alberto struck the Florida panhandle and proceeded northeast before stalling just south of Atlanta, Georgia, inflicting over $1 billion in damage. The flood provided an opportunity to identify and document the successes and failures of state and local floodplain management programs and activities. The author assessed the impact of federal, state,

and local floodplain management activities on losses in the Flint River Basin, paying particular attention to the impact of the National Flood Insurance Program (NFIP) and local floodplain management efforts. He examines previous floodplain studies; evaluates the political situation affecting flood recovery in each community; examines federal, state, and local responses to the disaster, concentrating on recovery plans and the use of hazard mitigation programs to reduce future flood losses; analyzes the effectiveness of the NFIP; and offers a series of findings and recommendations based on the relatively successful recovery programs he found.

Reddy, Swaroop. 1992. *A Study of Long Term Recovery of Three Communities in the Aftermath of Hurricane Hugo*. HRRC Monograph 9B. College Station, TX: Texas A&M University, College of Architecture, Hazard Reduction Recovery Center. 171 pp.

The objectives of this report–a doctoral dissertation–included: 1) to determine the factors that explain the successful adoption of hazard mitigation measures during recovery, 2) to develop a conceptual understanding of the problems inherent in the adoption of mitigation during disaster recovery, and 3) to gain an understanding about the influence of pre-storm institutional regulations on mitigation during the recovery period. The major findings were: the stronger and greater the presence of eight implementation factors in a community, the greater the successful adoption of mitigation measures; local institutional involvement is essential in the successful adoption of mitigation; there is a strong linkage between development management and hazard mitigation; a strong linkage also exists between the protection of coastal resources and coastal hazard mitigation; and the existence of strong pre-storm institutional regulations help local jurisdictions promote the adoption of mitigation during recovery.

Rubin, Claire B. Martin D. Saperstein, and Daniel G. Barbee. 1985. *Community Recovery from a Major Natural Disaster*. Monograph No. 41. Boulder, CO: Natural Hazards Research and Applications Information Center. 295 pp.

The publication describes what was learned by a team that spent four years observing how 14 communities coped with the deleterious effects of disasters. The focus of the research was on the ways in which the local government's activities, as well as its interactions with other levels of government, affected the speed and/or efficiency of recovery. The role of community officials in recovery and post-disaster mitigation, the kind of disaster agent involved, the level of emergency planning and preparedness, the community's sense of itself and its future are all analyzed. Part I of the monograph discusses previous research, describes the design of the study, presents a framework for thinking about recovery, and explains how various elements of that framework affected the actual recovery processes of the communities studied. Part II of the monograph presents case studies.

Schwab, Jim, Kenneth C. Topping, Charles C. Eadie, Robert E. Deyle, and Richard A. Smith. 1998. *Planning for Post-Disaster Recovery and Reconstruction*. PAS Report No. 483/484. Chicago, IL: American Planning Association. 346 pp. Abstract available at www.planning.org/apapubs/details.asp?Num=1178. [accessed September 21, 2001]

This document helps community leaders and planners educate their constituents on how informed decisions and choices can affect the rebuilding process and yield a safer, more sustainable community. This report introduces planners to their roles in post-disaster reconstruction and recovery, and provides guidance on how to plan for post-disaster reconstruction side by side with all other players involved. A key theme throughout this report is

to rebuild to create a more disaster-resilient community. The report contains many references to technical resources.

Southern California Earthquake Preparedness Project. 1991. *Earthquake Recovery and Reconstruction Planning Guidelines for Local Governments*. Sacramento, CA: Southern California Earthquake Preparedness Project (SCEPP) and California Governor's Office of Emergency Preparedness. 75 pp.

This document recommends that local governments adopt a planning team approach to anticipate problems associated with community recovery from an earthquake. Following an introductory discussion of earthquake recovery concepts, the guidelines present separate sections dealing with the planning process, rehabilitation and rebuilding, local business recovery, housing displaced persons and families, the restoration of public facilities and services, and financing the recovery process. Recommended actions for local governments are provided for preparedness and mitigation, emergency relief, short-term recovery, and long-term reconstruction phases. Appendices list a set of lessons learned from previous earthquake recovery efforts and reprint California's Disaster Recovery Reconstruction Act of 1986.

Wetmore, French and Gil Jamieson.. 1999. "Flood Mitigation Planning: The CRS Approach." *Natural Hazards Informer* 1 (July). Boulder, CO: Natural Hazards Research and Applications Information Center. Available at www.colorado/edu/hazards/informer/index.htm. [accessed September 21, 2001]

Under the National Flood Insurance Program's Community Rating System, flood insurance premiums are reduced based on a community's floodplain management activities. This issue of *Natural Hazards Informer* reviews the CRS planning criteria and offers some suggestions for implementing a plan locally. It is based on the authors' 40 years of combined experience in flood mitigation planning and the lessons learned by others who have helped refine the CRS criteria.

Additional Reading

Berke, Philip R. Timothy Beatley, and Clarence Feagin. 1993. *Hurricane Gilbert Strikes Jamaica: Linking Disaster Recovery to Development*. HRRC Article 89A. College Station, TX: Texas A&M University, College of Architecture, Hazard Reduction and Recovery Center. 23 pp.

Berke, Philip R. Jack D. Kartez, and Dennis E. Wenger. 1993. "Recovery after Disaster: Achieving Sustainable Development, Mitigation and Equity." *Disasters* 17(2):93-109.

Eadie, Charles. 1991. *Phases of Earthquake Response and Recovery Planning*. Santa Cruz: CA: Santa Cruz Redevelopment Agency.

Emmer, R. E. 1994. *Flood Damage Reduction and Wetland Conservation. Three Successful Projects in Louisiana have Common Characteristics*. Topical Paper #6. Madison, WI: Association of State Floodplain Managers, Inc. (September.) 23 pp.

Executive Office of the President. 1998. *Federal Programs Offering Non-Structural Flood Recovery and Floodplain Management Alternatives*. A Federal Interagency Publication. Washington, D.C. 90 pp.

National Academy of Sciences. 1990. *Practical Lessons from the Loma Prieta Earthquake.* Washington, D.C.: National Academy Press.

Nigg, Joanne M. 1995. *Disaster Recovery as a Social Process*. Article No. 284. Newark, DE: University of Delaware, Disaster Research Center. 13 pp.

Plafker, George and John P. Galloway, eds. 1989. *Lessons Learned from the Loma Prieta, California, Earthquake of October 17, 1989.* Washington, D.C.: U.S. Department of the Interior, Geological Survey.

Spangle, William & Associates, Inc. 1991. *Rebuilding After Earthquakes: Lessons from Planners*. Portola Valley, California: William Spangle & Associates, Inc.

Spangle, William E., ed. 1987. Pre-Earthquake Planning for Post-Earthquake Rebuilding (PEPPER). Los Angeles, California: Southern California Earthquake Preparedness Project.

Wilson, Richard C. 1991. *The Loma Prieta Quake: What One City Learned.* Washington, D.C.: International City Management Association.