Chapter 4

USING DISASTER RECOVERY TO MAINTAIN AND ENHANCE QUALITY OF LIFE

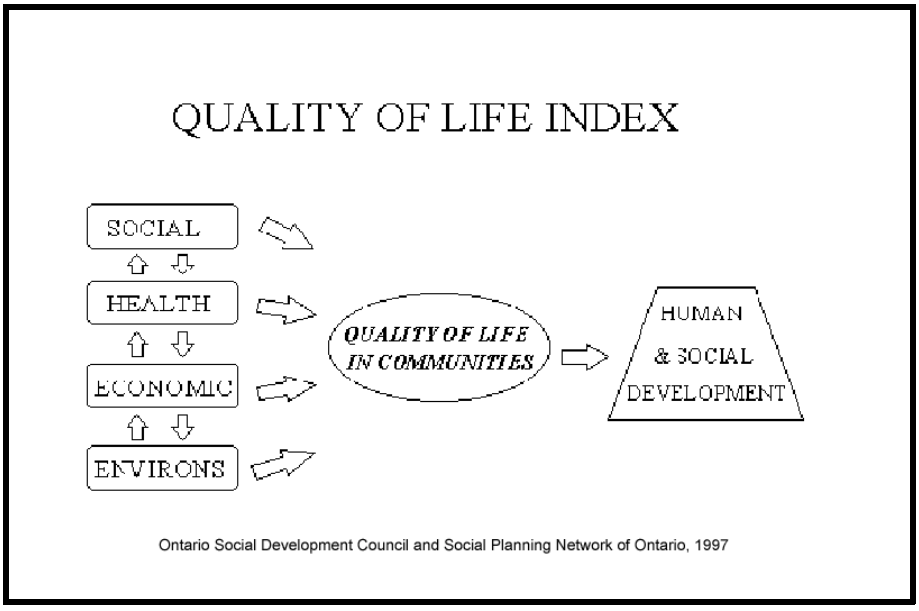
For the purposes of sustainability, the full range of stakeholders in local communities (government, business, and individuals) should begin to consciously define and plan for the quality of life they want and believe they can achieve for themselves and for future generations.
—Mileti, 1999, p. 32

INTRODUCTION

Quality of life means different things to different individuals, households, and communities. It requires a set of shared goals and visions that make life meaningful, valuable, and purposeful in a particular community setting. The disaster recovery period presents an opportunity to maintain and enhance quality of life elements such as:

- Housing—home ownership, affordable homes and rental properties, appreciating property values
- Education—adequate and safe public education
- Mobility—transportation alternatives and efficient flow of traffic
- Health care—access to good and affordable health care facilities and services
- Employment—individuals having suitable jobs and communities having low unemployment rates
- Recreation—well-designed public spaces, open spaces, parks, greenways, and recreational facilities
- Environment—clean, green, and with minimum pollution; resource- and energy-efficient residential and commercial buildings
- Economics—economic vitality and affordable products and services, local business owners, vibrant downtowns and business districts
- Public safety—least possible exposure to crime, pollution, threat of disease and disasters
- Equity and civic engagement—ability for residents, community groups, and the private sector to participate in planning and development efforts
- Disaster resilience—housing, employment, transportation, and public facilities that are protected from or able to withstand impacts from hazards.

Many residents value most of these elements and understand that the community's built, natural, and social environments greatly affect their quality of life. For example, it is increasingly reported that business location decisions are influenced by the quality of life that workers can expect to experience in a community. Shookner (1997) defines quality of life as the product of the interplay among social, health, economic, and environmental conditions that affect human and social development, as shown in the diagram.



How Disasters Disrupt Quality of Life

Disasters create sudden changes to social networks, lifelines, the environment, housing, and the economy and also have dramatic effects on the health and well being of community residents. The following scenarios demonstrate some of these changes and impacts played out in many communities year after year.

- Reduced mobility, access to services due to damaged infrastructure.
- Damaged public facilities (schools, central business districts and downtowns, historic districts, airports, harbors, stormwater systems, power plants, telecommunication centers) affect education, employment, recreation, business and the economy, and public safety.
- Damaged utilities (power lines, phone lines, water treatment plants) present a threat of disease and a breach of public safety.
- Partially damaged or uninhabitable housing can lead to loss of personal memoirs and documents, and homelessness.

- Economic disruption, whatever its immediate cause, can spur unemployment, loss of tax base, and a shortage of basic supplies. Unemployment can in turn sever access to health insurance and other benefits.

- Environmental damage can result from riverine erosion, beach/dune erosion, tree loss, and pollution of air and water.

- A traumatized population can be further affected by damaged medical facilities and limited access to social services, family services, and day care.

The Domino Effect in Urban and Rural Communities

Take a closer look at schools and their domino effect on the elements of quality of life. Schools serve multiple functions as centers of learning and recreation, centers of community and child care, and centers of employment. Some schools also serve as shelters and housing during the immediate post-disaster period.

Several communities also house colleges and universities that are a vital employment economic lifeline for many residents, business owners, and rental property owners. Additionally, loss of families due to outward relocation can damage the city and county tax base and in turn weaken the financial strength and educational services provided by schools.

Disasters can also have far-reaching effects beyond their immediate geographic impact zone. Other communities in the county or parish, metropolitan area, and even farther afield can experience partial disruptions in their lifestyles and quality of life.

Many large cities have the ability to absorb the negative effects of disasters. Some businesses and industries are far more disaster resilient than others, leaving them with little long-term effect. After Hurricane Floyd, both AT&T and Bell Atlantic took responsible proactive measures to relocate critical equipment in order to minimize future impacts. AT&T executives made the decision to move all the switching equipment out of the floodplain to other locations in the metropolitan area. These actions had the effect not just of minimizing the business's future risk, but also of protecting the quality of life of every user of that network.

National Impacts Felt When Hurricane Floyd Damages New Jersey Telecommunications Hubs

The Bell Atlantic telecommunications hub in Rochelle Park, a quarter-mile from New Jersey's Saddle River, was built before the area's designation as a floodplain. Hurricane Floyd left the basement of the Bell Atlantic building under six feet of water and cut telephone service to about a million local customers and to 8,000 automated teller machines throughout the country. The adjacent AT&T building that handled wireless calls for parts of New Jersey, New York, and Connecticut was also flooded.

— *The New York Times*, September 29, 1999, p. B1.

Our nation's rural communities do not always have this luxury. Some are emerging as bedroom communities with a broader economic base that includes manufacturing, recreation, and tourism as economic lifelines, but many are still agriculturally based. The tornadoes that struck Stroud, Oklahoma, a rural community southwest of Tulsa, devastated three of its four top employers. Suddenly the town's tax base dissolved and as a result its only hospital closed for good (Baruch and Baruch, 2000).

RECOVERY STRATEGIES FOR ENHANCING QUALITY OF LIFE

Enhancing quality of life can start during disaster recovery. A community can start with the *situations* that exist after a disaster, pick and choose among the *options* for improving its quality of life and among the implementation *tools* available to help pursue each of those options, to develop *strategies* that are specially tailored to its own needs. The Matrix of Opportunities in Chapter 1 shows some of the options a recovering community could use to improve quality of life when faced with certain disaster-caused predicaments. The situations and options shown on the matrix, and the tools listed below, are not exhaustive; rather, they are meant to give an idea of the range of possibilities. Likewise, the sample strategies below suggest ways in which some options and disaster-induced situations could be combined to help a community improve its quality of life. Notice how each of the strategies suggested below uses one or more of the options listed on the Matrix of Opportunities under the first sustainability principle, "Maintain & Enhance Quality of Life."

OPTIONS FOR MAINTAINING & ENHANCING QUALITY OF LIFE

- Make housing available/affordable.
- Provide education opportunities.
- Ensure mobility.
- Provide health & other services.
- Provide employment opportunities.
- Provide recreational opportunities.
- Maintain safe/healthy environs.
- Have opportunities for civic engagement.

Situation: Damaged transportation facilities
Recovery Strategies to enhance Quality of Life:

- Rebuild to increase mobility. Circulation patterns should allow efficient and safe movement between home, work, and recreation, as well as effective evacuation. Rebuilding efforts should not threaten neighborhood integrity, historic and cultural resources, or environmental quality.
- Allow for alternative modes of transit such as walking and cycling. Create connecting paths and greenways for pedestrians and cyclists, with some common nodes for social interaction.

- Beautify the parking lots of public facilities. Upgrade outdoor parking lot facilities to integrate greening concepts and improve aesthetics. Community residents can be asked to compete in design competitions or tree planting and tree maintenance programs.

Situation: Damaged public facilities
Recovery Strategies to enhance Quality of Life:

- Make public facilities less vulnerable to future hazards. Move public facilities out of known hazard zones (see Chapter 8 on mitigation) but first study the impact of their new locations on future growth and transportation patterns in the community.
- Enhance educational opportunities by rebuilding or upgrading schools. Repairs, modernization, and upgrades should focus not only on structural safety but also on energy efficiency.
- Enhance public facilities and access to them by designing or re-designing schools to be magnets for recreation, sports, and meetings. Ensure that schools have recreational facilities and meeting rooms to host sports tournaments and other activities.

Situation: Damaged utilities
Recovery Strategies to enhance Quality of Life:

- Relocate critical facilities and equipment out of known hazard zones or retrofit the facilities so that hardship and disruption of services is avoided.

Situation: Damaged housing
Recovery Strategies to enhance Quality of Life:

- Create disaster-resilient, affordable housing. Re-zone parts of the community for affordable housing.
- Inventory damaged housing that has a history of abandonment and tax delinquency. Consider buyouts of these properties to eliminate eyesores and to reduce potential negative impacts on property values and potential health threats.
- Move toward energy-efficient buildings. Provide education forums and advice for home and business owners on techniques and funding sources to replace aging, damaged heating and cooling equipment with the latest techniques and equipment to lower costs.
- Provide public spaces for social interaction and recreation. Buy out homes in known danger zones and utilize the space as parkland, community gardens or other public open spaces that will promote social interaction and recreation for all residents.
- Upgrade building codes so that new construction will be done to a higher standard.

Situation: Damaged commercial/industrial facilities
Recovery Strategies to enhance Quality of Life:

- Maintain employment opportunities and minimize economic disruption (see Chapter 5 on Economic Vitality for a full discussion).

Situation: Environmental damage
Recovery Strategies to enhance Quality of Life:

- Create or enhance natural resources and environmental features at the parcel/site level and at the regional/watershed level (see Chapter 7 on Environmental Quality for a full discussion).

Situation: Disruption of health and safety
Recovery Strategies to enhance Quality of Life:

- Use the opportunity to identify gaps in family services, social services, and health care facilities and ensure that emergency plans have defined strategies and policies for short-term and long-term sheltering for residents with special needs.
- Create or update the community's database of housing locations of most vulnerable populations for evacuation and rescue purposes. Create maps that show locations of different population segments and their potential vulnerability to future hazards.
- Consider whether staff in the health and social service sectors are representative of the wider community, especially with regard to spoken languages (see Chapter 6 on Social Equity for a full discussion).

Tools for Enhancing Quality of Life

Conceptually, communities with a good quality of life have certain traits in common: social ties are strong, the built environment supports a comfortable lifestyle, the economy is healthy, and environmental quality is preserved. In different communities, people will interpret these traits to mean different things and will place varying levels of importance on them. Consequently, which tools used after a disaster to improve a community's quality of life should depend, at least in part, on what residents desire to change for the better in the community. Below are some tools that could be used during recovery (or any time) to improve a community's quality of life.

TOOLS FOR ENHANCING QUALITY OF LIFE

- Public participation
- Zoning and land use planning
- Historic preservation
- Property acquisition
- Special protection of critical infrastructure
- Environmental improvements

Public Participation
Public participation is essential both to determine what quality of life issues are important to the residents and to obtain local support for improvements. There may be a community member willing to lead a task force or committee with a specific quality of life improvement goal. There may also be standing local committees to deal with such issues as housing, economic development, infrastructure, and hazard mitigation. Members of these committees can serve as liaisons to the public, educating other community members about the importance of disaster mitigation in improving quality of life. (Guidelines for structuring public participation are discussed in detail in Chapter 3 of this handbook.)

Zoning and Land Use Planning
Zoning ordinances are the development tools that regulate the location, type, and intensity of new development. Zoning has been used in many communities to restrict growth in high hazard areas, which can also improve quality of life by increasing safety. Examples of zoning techniques that have been traditionally used to keep development away from hazard areas are floodplain regulations, fault-line and coastal setbacks, and hillside development regulations.

National Flood Insurance Program communities should look into the Community Rating System (CRS). The CRS rewards communities that enact floodplain regulations that are stricter than those specifically required by the program by providing flood insurance at reduced rates. Every state has a National Flood Insurance Program coordinator, who can provide more information about the program. Information is also available on the Federal Emergency Management Agency's (FEMA's) website (www.fema.gov).

New kinds of sustainable land use planning can improve both quality of life and disaster resilience: smart growth, urban growth boundaries, infill development, minimum density zoning, and brownfields development are some available tools.

Smart growth refers to a development approach in which growth or economic development is in balance with the environment and quality of life. Smart growth directs new development to limited areas, encourages mixed-use development, and renovation of older areas.

Urban growth boundaries are used to control the extent of a city's sprawl. Rural and urban areas are clearly demarcated, with urban areas allowed to have much denser development than rural ones. Urban areas are designed to have mixed-use development, infill development, and land use patterns that may reduce the need for automobile travel.

Infilling refers to the development of vacant or less-developed parcels of land in already developed areas. Infilling encourages denser development in order to facilitate alternative transportation, urban renewal, and renewed economic vitality. Towns looking for places to house residents after a disaster might consider infilling existing urban areas.

Minimum density zoning requires that development densities stay above a certain level by mandating average or maximum lot sizes. The goal of minimum density zoning is to use land efficiently.

Brownfields are areas of land that were previously developed, where environmental concerns hinder new development. Brownfields can be reclaimed for new development through an Environmental Protection Agency program known as the Brownfields Economic Redevelopment Initiative. Brownfield redevelopment can improve the overall health and safety of the community, because brownfields must be remediated, but planners should bear in mind that environmental remediation can take time.

Historic Preservation

Preserving a community's historic architecture and design adds to its aesthetic appeal, but often historic buildings were built in the path of natural disasters or have deteriorated to the point that they are unsafe. Both FEMA and the National Park Service (NPS) administer programs to help communities preserve historic buildings. FEMA's Repair and Restoration of Disaster-Damaged Properties works in concert with the Stafford Act to evaluate the effects of repairs to, restoration of, or mitigation of hazards to disaster-damaged historic structures. Through its Historic Preservation Grants-in-Aid, the NPS provides matching grants to states to expand the National Register of Historic Places.

Property Acquisition
Alternative transportation and recreation are two quality of life goals that can go hand-in-hand with disaster mitigation. FEMA's Hazard Mitigation Grant Program allows for the acquisition and relocation of damaged properties. Land from buyouts can be converted to public open space.

The Transportation Emergency Relief Program under the auspices of the Federal Highway Administration provides aid for repair of federal-aid roads. These funds can be used to improve the quality and lifespan of these roads.

The NPS's Rails to Trails program allows communities to use an old railroad right-of-way for a bike or walking path. Because many railroads were built on the lowest ground available, they are often in the floodplain. Maintaining the area as a trail corridor, rather than developing it, can save money when the next flood happens and, in the meantime, provide recreation and transportation opportunities for the community. The NPS also operates a Land and Water Conservation Grant program that allows for the acquisition of land for and development of outdoor recreation areas, and a Park and Recreation Recovery Program that allows communities to provide recreational facilities in areas prone to natural hazards.

Special Protection of Critical Infrastructure
At the very least, communities need to ensure that in a natural disaster, water, energy, and shelter will be available. Some communities have learned from experience the importance of taking steps to ensure that these necessities are available.

The city of Des Moines, Iowa, built a drinking water treatment plant near the confluence of the Raccoon and Des Moines rivers. In 1993, during the great Midwest flood, floodwaters from the Raccoon and Des Moines caused flooding that overtopped the drinking water treatment plant's levee. The plant was out of service for more than a week, leaving 300,000 people without drinking water. After the 1993 event, Des Moines became a Project Impact community. One of the town's first mitigation activities was to expand the floodwall at the water plant, from 24 feet to 31 feet (Hauer, 1996).
—www.fema.gov/impact/cities/im_ia03.htm)

Energy needs can be reduced by retrofitting existing buildings and encouraging the use of new techniques in new construction. Reducing energy needs could be a critical first step to ensuring that a community has energy reserves to deal with the next heat wave or cold snap. A community might consider high R-value insulation in walls or ceilings; underground power lines that are not as susceptible to damage during storms as hanging lines; designing for efficiency in terms of size and scale of buildings; retrofitting heating, ventilation, and air-conditioning (HVAC) systems, energy-efficient windows and appliances; and conversion to alternative fuels.

Environmental Improvements
Landscaping and natural vegetation enhance the quality of life in a community while also can improve disaster resilience and preserving environmental functions and values. Trees break the force of the wind and stabilize the soil, while providing shade and improving community aesthetics. Wetlands store flood water, improve surface water quality, and provide habitat for birds, which in turn, provide a recreational opportunity for local bird-watchers. Fire-resistant

vegetation can improve safety in wildfire-prone areas. On the coast, native vegetation can decrease erosion and create habitat for native species.

There are several groups and programs that can assist with environmental improvements. For example, the National Arbor Day Foundation has nine programs that encourage communities to plant trees. Many other environmental enhancement programs are discussed in detail in Chapter 7 of this handbook.

PURSUING STRATEGIES TO IMPROVE QUALITY OF LIFE

Once the recovery ideas or strategies are identified, the community will need to explore them through a systematic process in order to decide on the best approach, select feasible tools, locate technical assistance, formulate details, plan for action, find funding, get approval, and move toward implementation.

Enhancing Quality of Life During the 10-Step Recovery Process

Even if the community does not have or create a formal plan for enhancing quality of life, strategies for that principle of sustainability can be carried out in the context of the overall disaster recovery. Within the 10-step process described in Chapter 2, the following activities in particular will help ensure that quality of life is improved during a community's disaster recovery.

Actions to take during Step 2, Involve the Public

The recovery period presents a vast opportunity to improve the local civic capacity and to bring together diverse segments of a community. Chapter 3 provides important information about different approaches that can be used to maximize participation and Chapter 6 tells how to identify and involve people that may have been overlooked in the past.

What to Do

- Be creative—organize meetings at proper times and venues, and make sure to provide transportation, child care, and food.

- Do not reinvent the wheel. Review this manual and other resources to come up with examples of communities that have successfully incorporated principles of sustainability during the recovery process. Be prepared to share this information with the public, drawing similarities with the local situation.

- Use different media (flyers, posters, local newspaper, local television stations, and the Internet) to reach the public.

Actions to take during Steps 4 and 5, Assess and identify the problems.

Use this window of opportunity to discuss the pre-disaster conditions that detracted from the community's quality of life that can now be corrected. Use the Matrix of Opportunities shown in Chapter 1 as a starting point.

What to Do

- As part of forums, ask community members to voice what they like and dislike about their community. This information may already be available if the community recently completed a master plan that engaged residents in a visioning process for another project. If so, use it as a starting point to ask residents to update the list.

  After the meetings planners should be able to verbalize the following:
  - What were the pre-disaster problems?
  - What are the post-disaster problems? Which problems are common?
  - Which problems are different?
  - Which problems must be addressed to create, maintain, and enhance the quality of life in the community?

The New York Quality Communities Task Force listed some concrete terms that residents used to describe their community vision:

- lovely old homes
- good place to send your children to school
- lots of cultural opportunities
- good housing available
- friendly people.

—www/state.ny.us/ltgovdoc/cover pdf.html

Actions to take during Step 6, Set Goals and Objectives

The disaster recovery team is in the special position to work with its community to define what quality of life means to community members and create the relevant conditions during the redevelopment phase. In setting goals, public officials should engage the community in the visioning process to choose the quality of life elements that they wish
to safeguard.

What to Do

- Prepare a map of the community making sure to show main landmarks and roads. As part of meetings and forums ask residents to list their address and place a square (□) on the map to indicate where they live and an (x) where they work.

- Prepare a simple form so that residents can place a check mark next to the elements that are important to maintain and improve their quality of life. Leave blank spaces for them to add in others. Possible examples are:
  - agriculture and related industries
  - historic and rural nature of the town
  - economic vitality and influx of new businesses
  - open space, greenways, and parks
  - energy and/or water efficiency
  - diversity of species or natural resources
  - disaster-resilient, affordable housing
  - low unemployment rates
  - good public education
  - easy access to centers of employment, education, and recreation
  - easy flowing traffic (and planned evacuation routes)
  - public transit
  - community centers.

- Prepare a final map of the community from the exercises done in the prior steps, summarize the main outcomes and distribute a one page flyer to the attendees and the media as part of announcing a follow-up forum or meeting to discuss and review possible strategies and actions. Try to reach more residents, and those from different groups.

Rhineland, Missouri, a community of 157 people, was relocated to a 49-acre plot adjacent to its previous location after being flooded four times in 1993. This effort boasts a 96% participation rate, and a well planned redevelopment phasing process.

Rhineland's sources of funding included
- Community Development Block Grants (for infrastructure, sewers, and commercial),
- Economic Development Administration,
- Federal Emergency Management Agency,
- Missouri Housing Development Commission, and
- Village of Rhineland.

Actions to take during Step 7, Explore all alternative strategies

Besides considering different ways to build in quality of life concerns, work to consolidate multiple sustainability objectives as well–economic, environmental, social, and mitigation.

Select from the opportunities identified under Step 5, the goals and objectives set in Step 6, and the options and tools described in this chapter. The strategies will need to be expanded and tailor them to meet the needs of the community. It is important at this juncture to be sure that any alternative selected does not detract from any of the principles of sustainability.

Actions to take during Step 10, Implement, evaluate, and revise.

Because recovery is a long-term process, goals and policies for improvements in the quality of life that were formulated early in the process must be implemented gradually with ongoing funding, and by institutionalizing appropriate procedures, rules, budgets, and policies.

One of the most problematic areas is obtaining funds to carry out the community's objectives. Be creative in seeking out grant funding, technical assistance, or in asking for assistance from agencies with quality of life interests. Do not focus only on assistance provided by the federal government. Other resources and tools can be extremely helpful.

North Carolina's Division of Emergency Management has provided communities with guiding principles of sustainability and related strategies and indicators that will result in communities that are more resilient to future natural disasters and have a higher quality of life. The goals are categorized as:
- Sustainable Housing
- Sustainable Business
- Sustainable Critical Infrastructure
- Sustainable Environment

See the manual "Hazard Mitigation in North Carolina: Measuring Success," produced by NCDEM and the Federal Emergency Management Agency, listed at the end of the chapter.

Examples of Success

The long-term recovery and reconstruction period has been used to (re)build good quality of life. Some communities have replaced aging, damaged buildings with new structures, built with the latest techniques and equipment to lower heating and cooling costs. Others use this opportunity to remedy their community's environmental and economic problems, and social problems such as the lack of disaster-resilient affordable housing. Some communities have had to begin from scratch; it is difficult, given disparities in financial and technical resources, but it is possible.

Affordable housing and home ownership have emerged as a top priorities in many rebuilding efforts. However, this affordable housing should also be disaster resilient. Research institutions, non-profit organizations, and FEMA can provide resources and advice on design and building options that are both safe and affordable. Use available resources; there is no need to start over.

The Housing Authority of Racine County in Racine, Wisconsin, has a project focused on building disaster-resilient rooms in low-income housing. Such rooms are designed to withstand winds of up to 250 mph. FEMA estimates the cost of adding a safe room to a new home or retrofitting an existing home with a safe room at $2,000–$4,000. The Johnson Bank in Racine County offered low-interest loans to those interested in retrofitting their homes with safe rooms (Harper, 2000).

Arkadelphia, Arkansas, was struck by a devastating tornado in 1997. Zoning regulation changes and a mix of funding sources have resulted in a greater diversity of housing types. Rural Development Administration funds were used to build attractive low-income, multi-family units and Housing and Urban Development funds were used in an innovative equity buy-down program to finance single-family home construction.

Soldiers Grove Marches On

The relocation of Soldiers Grove, Wisconsin, took place from 1979 to 1983 and was used as a "community heart transplant" to eliminate flooding and realize other social and economic goals.

Upon the realization that a much-anticipated levee would cost $3.5 million (to protect $1 million worth of property), community leaders suggested that the federal government spend that money to help relocate the town instead. The community used the relocation/redevelopment phase to get out of the hazardous floodplain and address problems of a dwindling population (due to out-migration of youth to urban areas), a declining economy, and a blighted downtown.

- The old floodplain was developed as a municipal park
- The critical facilities and buildings (the fire station) were relocated out of the floodplain.
- The downtown and main street were moved closer to U.S. Highway 61 to increase activity.
- Water and sewer were extended to new development sites along the highway to encourage development.

See www.sustainable.doe.gov/success/soldiers.shtml

VISIONS – Valmeyer Integrating Sustainability into Our New Setting

Valmeyer, Illinois, is one of the largest communities in U.S. history to completely relocate out of a floodplain. This community of 900 people located 25 miles south of St. Louis rebuilt their new town (hundreds of houses, a downtown, churches, a school, a fire station, and a post office) from scratch, 2 miles east of the older Valmeyer and 400 feet higher on a 500-acre parcel.

The residents lived in transition in what became known as the "FEMAville" trailers while each family used insurance settlements and buyout money from the Federal Emergency Management Agency to rebuild their homes. Long-time residents were determined to stay in the small farm town where they felt safe and secure—what they viewed as the quality of life they wanted to maintain. The community was also the first to benefit from the assistance of the Department of Energy's Working Group on Sustainable Development and used substantial federal grants to encourage the use of energy-efficient technologies.

VISIONS became a slogan that guided the creation of the new Valmeyer with:

- many energy-efficient new homes (highly insulated, energy-efficient windows, low-flow showerheads, water conserving toilets, efficient heating and cooling systems)
- some passive solar homes and use of ground source heat pumps.

(Watson, 1996)

MONITORING QUALITY OF LIFE

These five indicators and accompanying questions can be used as public officials work to maintain and enhance quality of life for the community and its residents.

1. **A long time horizon in the decisionmaking processes.**
   How do the immediate short term reconstruction efforts affect the overall long-term efforts to maintain and enhance a community's quality of life?

   It is important for the recovery team to keep track of the immediate post-disaster recovery, repair, and reconstruction activities. They should not jeopardize long-term sustainability efforts.

2. **Consistency with other local planning and development efforts.**
   Do the quality of life elements envisioned by the community complement other locally-driven planning and development initiatives?
   The need to address quality of life should already be a guiding principle that is inherent in many ongoing local, state, and federal initiatives related to smart growth, economic development, housing, and transportation. Join forces with these other programs.

3. **Management for multiple objectives.**
   How is this process promoting multi-objective management? Practice multi-objective management whenever possible. All the case studies demonstrate this

City of Quincy wins HUD's Local Best Practices Award

Recovery after disaster declarations for Nor'easters in 1991 and 1992 gave Quincy, Massachusetts, the opportunity to address its quality of life goal of increasing the availability of financing for affordable housing within the city. The city provided a range of options for homeowners whose property was located in floodprone areas. The goal was to reduce vulnerability through retrofit, relocation, and structural improvements. The city also forged some creative partnerships by incorporating public funds not traditionally applied to mitigation. These activities contribute to a more sustainable community.

The success of the city's First Time Home Buyer/Local Lender Memorandum of Understanding was recognized by the U.S. Department of Housing and Urban Development when it granted a 2000 Local Best Practice Award to the City. Signees of the Memorandum included the City of Quincy through its Department of Planning and Community Development, HUD, the Massachusetts Department of Housing and Community Development, and local lenders including the Bank of Canton, Citizens Bank, Colonial Federal, Consolidated Mortgage Services, Inc., Eastern Bank, and Fleet Boston.

The three strategies included in the program demonstrate the city's commitment to incorporating multiple objectives into its mitigation strategies (1) Housing retrofitting; (2) Public works improvement; and (3) Housing acquisition and demolition.

— www.hud.gov/bestpractices/2000/mass.html

in one form or another. Where appropriate, set goals that are consistent with a recent comprehensive plan. Make sure the comprehensive plan takes into account the vulnerable areas.

4. **A vision shared by community residents.**
   How is this process promoting public participation by everyone?
   Always remember that quality of life should be a "shared" vision of community residents from diverse backgrounds (rich and poor, employed and unemployed, young and old, homeowners and renters, business owners and consumers). This will be a continuous process as different groups of people move in and out of the area.

5. **Consideration of the quality of life for current and future residents**
   Is the redevelopment process contributing to an improved quality of life for current and future generations?
   Aim to improve the following factors and conditions that can maintain and enhance quality of life—employment opportunities, social interaction, environmental quality, energy efficiency, equity, opportunities for civic engagement and community building, education, recreation and pleasure, affordable housing, health and safety. It makes for a stronger community!

REFERENCES

Baruch, S. and M. Baruch. 2000. "The Economic Vulnerability of Rural Businesses to Disasters." *CUSEC Journal* 7 (21):8-9.

Geis, D.E. 2000. "By Design: The Disaster Resistant and Quality of Life Community." *Natural Hazards Review* 1(3):151-160.

Harper, C. 2000. "Design and Construction Can Help Rural Homes Avoid Wind Damage." *Rural Voices* 5(4):5-7

Hauer, Andrea. 1996. "The Power of Water in Des Moines, Iowa." *Forum for Applied Research and Public Policy* 11(3):131–33.

Mileti, D. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington, D.C.: Joseph Henry Press. Available at books.nap.edu/catalog/5782.html. [accessed September 21, 2001]

Shookner, Malcolm. 1997. *Quality of Life Summary Report*.Toronto, Ontario, Canada: Social Development Council and Social Planning Network of Ontario. www.qli-ont.org/report.html

Watson, B. 1996. *A Town Makes History Rising to New Heights*. www.sustainable.doe.gov/articles/smithsonian/index.shtml and www.sustainable.gov/success/Valmeyer.shtml

WHERE TO FIND MORE INFORMATION

Organizations

Boulder Area Sustainability Information Network (BASIN).
BASIN is a pilot project designed to help deliver a variety of environmental information about the Boulder area to its inhabitants. BASIN desires to 1) improve environmental monitoring to provide credible, timely, and usable information about the watershed; 2) create a state-of-the-art information management and public access infrastructure using advanced, web-based computer technologies; 3) build strong partnerships and an ongoing alliance of governmental, educational, non-profit and private entities involved in watershed monitoring, management and education; and 4) develop education and communication programs to effectively utilize watershed information in the public media and schools and facilitate greater public involvement in public policy formation.
See bcn.boulder.co.us/basin/main/about.html [accessed July 23, 2001]

Disaster Resistant Neighborhoods. "Building Disaster Resistant Neighborhoods Handbook."
This handbook outlines a step-by-step action plan, with examples, to assist planners in working with neighborhood associations to help them become better prepared for disaster. Posted on the link along with the handbook are a variety of tools to assist in promoting the program.
See www.tallytown.com/redcross [accessed September 21, 2001]

Joint Center for Sustainable Communities.
The advisory committee includes Wellington Webb, Mayor of Denver and President, the U.S. Conference of Mayors and C. Vernon Gray, President, National Association of Counties.
See www.naco.org/programs/comm_dev/center or www.usmayors.org/sustainable [accessed August 3, 2001]

Local Government Commission.
The LGC is a non-profit organization "working to build livable communities" in California. LGC organizes a variety of conferences, workshops, and training sessions on land use and transportation-related issues. The organization also publishes a monthly newsletter and has a resources library with a catalog of videos and slides.
See www.lgc.org/center [accessed June 15, 2001]

National Arbor Day Foundation
This group sponsors programs that encourage communities to plant trees.
See www.arborday.org [accessed June 15, 2001]

Videos, CD-ROMs, and DVDs

The Link Between Sustainability & Disaster Resistant Communities. Slide show produced by the U.S. Department of Energy and the Federal Emergency Management Agency.
www.sustainable.doe.gov/disaster/impact
This slide show explains the concept of sustainable redevelopment and gives examples of redevelopment in three communities: Soldiers Grove, Wisconsin; Valmeyer, Illinois; and Arkadelphia, Arkansas.

Mitigation Revitalizes a Floodplain Community: The Darlington Story. Wisconsin Department of Natural Resources. 1997. Madison, WI.
This is a splendidly produced videotape about the efforts of a small rural Wisconsin community to reverse the effects of neglect and disinvestment in its historic downtown area caused by repeated flooding and economic change. Using a multi-objective planning and management strategy, officials and citizens, in partnership with government agencies and private entities, identified six goals: 1) preserve the historic character of the downtown; 2) restore community pride; 3) acquire and relocate commercial properties at risk; 4) elevate and flood proof commercial and residential structures; 5) stimulate investment downtown; and 6) pursue tourism as an economic strategy. The video follows the mitigation process from early meetings through floodproofing and relocation. Produced by the Wisconsin Department of Natural Resources. 27 minutes. 1997. Available free from Wisconsin DNR, P.O. Box 7921, Madison, WI 53707-7921; (608) 264-9200.

Quality Redevelopment of Eastern North Carolina. Horizon Video Productions. 2000. Durham, NC.
This 20-minute video was produced by the state in the aftermath of Hurricane Floyd to introduce and educate local and state officials about the "better ways" available to recover from the disaster and at the same time address other local concerns such as environmental quality, economic vitality, housing, sense of community, business and job opportunities, and disaster mitigation. It

introduced a framework espoused by the state for sustainable community action and features the governor explaining the tenets of "quality redevelopment" and how it can—and did—benefit North Carolina communities and help ensure a better future for the state's citizens. Available from North Carolina Department of Emergency Management, 1830-B Tillery Place, Raleigh, NC 27699; (919) 751-8000; fax: (919) 715-9763.

Taking the Initiative. Federal Emergency Management Agency, Emergency Management Institute. 2000. Emmitsburg, MD.
This 20-minute video shows how a neighborhood, two small towns, and a business owner took responsibility for and got organized to adopt sustainability principles and techniques in coping with hazards. The three separate instances, all in California, illustrate participatory processes, taking initiative, looking at the economic benefits of hazard mitigation (in one case, elevating a restaurant), incorporating livability components into a flood protection measure, and protecting the local environment and habitat. This video is available from the Emergency Management Institute at 1-800-238-3358. Ask for the "Disaster-Resistant Jobs" video.

Books, Articles, and Chapters

Berke, Philip and Maria Manta. 1999. *Planning for Sustainable Development: Measuring Progress in Plans*. Lincoln Institute of Land Policy Working Paper. Lincoln, NE: Lincoln Institute of Land Policy. 23 pp.
Using six principles that define and operationalize the concept of sustainable development, the authors evaluated 30 comprehensive plans to determine how well the policies of these plans supported sustainable development. Findings indicate no significant differences in how extensively sustainability principles were supported between plans that state an intention to integrate sustainable development and those that did not. In addition, plans did not provide balanced support of all six sustainability principles; they supported one–the livable built environment principle–significantly more than the others.

Casey-Lefkowitz. 1999. *Smart Growth in the Southeast: New Approaches for Guiding Development.* Washington, D.C.: Environmental Law Institute Research Publications.
The southeastern United States has been trying to find ways to continue to reap the benefits of the region's bustling economy without the mounting fiscal, health, and environmental costs of poorly planned development. This report provides an overview of land use and transportation trends in seven states–Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee, and Virginia–and shows how these states are beginning to shape the pace and location of development by promoting community revitalization, conservation, and transportation alternatives.

Clinton-Gore Administration. 2000. *Building Livable Communities: Sustaining Prosperity, Improving Quality of Life, Building a Sense of Community.*
This report identifies steps that the Clinton-Gore Administration took to help communities grow in ways that ensure a high quality of life and strong, sustainable economic prosperity. It includes a brief description of challenges faced by urban, suburban, and rural communities, the innovate ways that some are meeting them, and the Livable Communities Initiative–a package of 30 policy actions and voluntary partnerships that support local efforts to build livable communities.

CUSEC Journal 7(1).
This special issue focused on the economic vulnerability of rural communities and on disaster recovery for small businesses. The journal is produced by the Central U.S. Earthquake Consortium. For more information contact the CUSEC Office at (901) 544-3570 or see www.cusec.org [accessed September 21, 2001]

Department of Energy. 1994. *Rebuilding Your Flooded Home: Guidelines for Incorporating Energy Efficiency*. DOE-EE-0019. Washington, D.C.: U.S. Department of Energy, Office of Building Technologies, 36 pp.
After disasters, the natural tendency is to return to one's home and restore it to the way one left it. Due largely to recent advances in building technologies, it is possible to rebuild a residence with a little extra care–and not much more time and cost–and have a home that is much more energy efficient than it was before the disaster. Because many house components will have to be replaced, i.e., insulation, it makes sense to purchase the most energy-efficient equipment and materials available. Following sections about drying out a flooded house and on personal safety when cleaning up, the document explains how to analyze the property for building shell problems (air leakages, foundations, flooring, etc.), then considers building systems and equipment issues (electric motors, air conditioning, and appliances). Suggestions are presented and tips are provided for financing energy-efficient solutions, such as buying materials in bulk if many properties are affected.

Federal Emergency Management Agency. n.d. *Safeguarding Your Historic Site: Basic Preparedness and Recovery Measures for Natural Disasters.* Boston, MA: U.S. Federal Emergency Management Agency, Region I. 55 pp.
Drawing upon experience gained through disasters in Nantucket, Massachusetts, and Montpelier, Vermont, this document helps stewards of historic sites–including historic buildings, landscapes, districts, and museums–prepare their sites to withstand and recover from a natural disaster. The handbook can also be used by public officials, planners, community development professionals, and emergency management professionals as a general step-by-step guide to emergency planning for such facilities. Before a disaster strikes, the handbook provides information about identifying and assessing the risks to a facility, describes preventive measures for historic sites, and presents emergency planning guidelines. During the disaster itself, the handbook describes what can be done in the time available. After the disaster, guidelines are given for stabilizing the situation and recovering from the impacts. Preventive measures and preservation considerations are provided for four disaster agents: wildfire, hurricanes, riverine floods, and earthquakes.

Federal Emergency Management Agency. 2000. *Planning for a Sustainable Future: The Link Between Hazard Mitigation and Livability.* FEMA Report 364. Washington, D.C.: Federal Emergency Management Agency. 40 pp. Available at www.fema.gov/mit/planning_toc.htm.
This booklet is about hazard mitigation, disaster resistance, sustainable development and livability, and describes the linkages among these concepts. It shows how communities that undertake hazard mitigation planning become more disaster resilient and reap further benefits. Hazard mitigation links disaster resistance to broad community objectives of economic health, social well-being, and environmental protection.

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.
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.

Flink, Charles A. and Robert M. Searns. 1993. *Greenways: A Guide to Planning, Design, and Development*. Washington, D.C.: Island Press. 351 pp.
Within the developed landscape, greenways serve a dual function: they provide open space for human access and recreational use, and they serve to protect and enhance remaining natural and cultural resources. This manual provides interested organizations and concerned individuals with background information about planning a greenway project, how to enlist local assistance in organizing project support, funding the project, related water recreation, greenway safety and liability, management, and planning for the care of rivers, streams, and wetlands. Information is provided on preserving stream and river functions, the impacts of urbanization on riparian regimes, and the establishment of organizational partnerships to plan, realize, and preserve greenway arrangements.

Geis. D.E. 2000. "By Design: The Disaster Resistant and Quality of Life Community." *Natural Hazards Review* 1(3):151-160.
According to Geis, the present approach to designing and building communities is inadequate and is inflicting great and growing harm–physically, environmentally, socially, economically, and emotionally–that we can no longer tolerate. The disaster resilient community concept, the first step toward creating quality-of-life communities, was created specifically to provide a new way of thinking. A number of basic questions need to be addressed. What are Disaster Resistant Communities? Why are they important? What are the benefits? What is the relationship between a Disaster Resistant Community and a sustainable quality-of-life community? And, most importantly, how do we go about creating them? This article provides the answers to these questions so that the concept can be better understood and used to its fullest potential.

Kline, Elizabeth. 1997. *Sustainable Community: Topics and Indicators.* Available at ase.tufts.edu/gdae/modules/modinstruct.html [accessed June 22, 2001]
These narratives about sustainable community indicators were developed under a contract with the U.S. Environmental Protection Agency. The primary audiences are community practitioners and technical resource people.

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 policymakers and practitioners.

North Carolina Emergency Management Division and Federal Emergency Management Agency. 2000. *Hazard Mitigation in North Carolina: Measuring Success*. Raleigh, NC.
To accelerate the institutionalization of hazard mitigation in North Carolina, the North Carolina Emergency Management Division established the Hazard Mitigation Planning Initiative, a long-term program to build local capacity to implement mitigation policies and programs in communities across the state. Through a series of case studies, this study documents losses avoided as a result of the implementation of a wide range of mitigation measures, including elevations and the acquisition and relocation or demolition of floodprone properties.

Rueter, Patty. 1998. *Town Centers: Why? What? How?* Portland, OR: Portland State University, School of Urban and Public Affairs, Institute of Metropolitan Studies, Community Fellowship Program.
This report is a study of Portland's growth management challenge including reviews of history, standards, and societal needs as they related to recent community involvement in Portland's town center planning process.

Rural Voices 5 (Fall)
This special issue of the magazine, produced in 2000 by the Housing Assistance Council, featured several stories on the "Lessons from Disaster." The Housing Resource Council has also written a guide that explains resources available from federal and state governments for rebuilding housing after a disaster, on a temporary basis or long-term. Contact the national office at (202) 842-8600 or hac@ruralhome.org

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.

U.S. President's Council on Sustainable Development. 1997. *Sustainable Communities Task Force Report.* Washington, D.C.: U.S. Government Printing Office. 186 pp.
This report, and its companion volume, *Sustainable America: A New Consensus for Prosperity, Opportunity, and a Healthy Environment for the Future*, published in 1996, lay out a set of policy recommendations for planning for sustainable communities. One of the recommendations is to "shift the focus of the federal disaster relief system from cure to prevention." The appendix contains case studies of communities that have set forth sustainability principles, profiles of communities in the 50 states, state-led sustainability initiatives and organizations, and a list of resources for sustainable communities.

Additional Reading

Baruch, S. and M. Baruch. 2000. "The Economic Vulnerability of Rural Businesses to Disasters." *CUSEC Journal* 7(21):8-9.

Department of Housing and Urban Development. 1998. *Building Communities and New Markets for the New Century.* Washington, D.C.: U.S. Department of Housing and Urban Development. 78 pp. plus second volume of appendices.

Hanson, Kate and Ursula Lemanski. 1995. "Converting flood 'buyout' areas to public open space: Case studies from Iowa." Pp. 95-100 in *From the Mountains to the Sea--Developing Local Capability.* Proceedings of the Nineteenth Annual Conference of the Association of State Floodplain Managers. Special Publication 31. Boulder, CO: Natural Hazards Research and Applications Information Center.

Harper, C. 2000. "Design and Construction Can Help Rural Homes Avoid Wind Damage." *Rural Voices* 5(4):5-7.

Moran, E.F. 2000. "North Carolina Disaster Recovery: Lessons Learned." *Rural Voices* 5(4):12-15.

New York Times. 1999. "Suburbia Learns It Has Paved Over the Natural Defenses to Flooding" Wednesday, September 29: B1&B8.

Tibbetts, John. 1998. *Open Space Conservation: Investing in Your Community's Economic Health.* Cambridge, MA: Lincoln Institute of Land Policy.