

# 7.1

Natural Hazards Research and Applications Information Center (2001).

Introduction to sustainability. *Holistic disaster recovery: Ideas for building local sustainability after a natural disaster* (Chap. 1). Fairfax, VA: Public Entity Risk Institute.

The 2001 full text version is a free download available at

<http://www.colorado.edu/hazards/publications/holistic/holistic2006.html> The later edition is published as a book for sale.

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## Chapter 1

# INTRODUCTION TO SUSTAINABILITY

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*There is no myth about the central meanings of sustainability. They are rooted in perennial themes of responsibility to others, providing for the future, and dependence of life on the natural environment.*

—Reid 1995, p. xv

This handbook is for managers or decisionmakers who know that it is important to have higher aspirations for the kinds of communities people live in, and for the types of lives they have access to. These decisionmakers have thought about the troubling aspects of seemingly built-in inequities in many social and economic institutions here in the United States, and may have observed, for example, that sprawling suburbs often mean a loss of community among the people living in a neighborhood. Some decisionmakers reading this handbook may have had experience with a natural disaster and come away thinking that there has got to be a better way to cope with such events than simply rebuilding and hoping it won't happen again.

Doing the right thing—and the best possible thing under the circumstances—is a goal shared by all responsible local officials and staff. It can be a complex undertaking, however, given competing demands, political and economic hurdles, and a bewildering array of ideas and special interests at play. *Sustainability* is an embracing concept that can give localities a framework within which to do many of the forward-looking things that they are already doing (or want to do), whether they be improvements in lifestyle, safety, economic opportunity, or protecting the environment. Sustainability provides an ideal toward which to strive and against which to weigh proposed activities, plans, and decisions. It is a way of looking at a community within its broadest possible context, in both time and space.

A sustainable community thrives from generation to generation because it has

- a social foundation that provides for the health of all community members, respects cultural diversity, is equitable in its actions, and considers the needs of future generations;
- a healthy and diverse ecological system that continually performs life-sustaining functions and provides other resources for humans and all other species; and
- a healthy and diverse economy that adapts to change, provides long-term security to residents, and recognizes social and ecological limits.

The classic definition of sustainability, developed by The World Commission on Environment and Development (the Brundtland Commission) is “[meeting] the needs of the present without compromising the ability of future generations to meet their own needs” (1987, p. 188). Similar concepts are being referred to today with such terms as “sustainable development (or redevelopment),” “development excellence,” “smart growth,” and “sustainable ecosystems.”

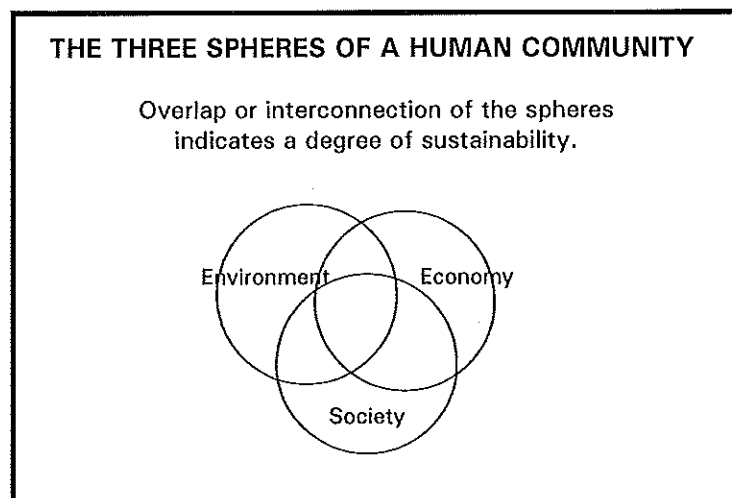
## WHAT DOES SUSTAINABILITY MEAN FOR A COMMUNITY?

A community can be thought of as being made up of three spheres: a social sphere, an environmental sphere, and an economic sphere. Sometimes they are called the three Es—equity, environment, and economics.

- The *social* sphere consists of all the interactions among people—cooperating in their neighborhood activities, practicing their religion, enjoying their families, sharing cultural identities, solving problems together, being friends.
- The *environmental* sphere is the natural and physical setting in which the community exists—the visible landscape as well as the not-so-visible resources like groundwater, air, and fertile soil. People in a community rely on and use these common resources.
- The *economic* sphere within a community consists of all the activities, transactions, and decisions that are based on producing and exchanging goods and services—to each other and to outsiders.

These spheres can appear separate from one another, but in fact they are all intimately related. A town could not exist for long if the early people had totally depleted or contaminated the groundwater, for example. It would not be a nice place to live if some of the people were made to endure poverty-level living conditions so that others could enjoy economic success.

Sustainability, then, means the ability to or the capacity of a community to maintain itself over time. It means that the community is a good place to be, that its foundations are solid and healthy, and that it can cope with the changes that time brings. To have a really sustainable community, the three systems must be integrated in a give-and-take



relationship. In theory, the more they overlap, the more sustainable the community will be (see figure), although there are practical limits.

Although “communities” can be any size, in this handbook the term is used to mean the local entities by which most people are organized in the United States—a neighborhood, city, town, village, county, or parish. Whether it consists of 500 people or a half-million, it is a community because the people that live there are connected by the interactions they have among themselves and their physical location.

## HOW A COMMUNITY BECOMES SUSTAINABLE

To be sustainable, a community needs to maintain the overlap and integration of its social, environmental, and economic spheres. Each sphere or system has many components, and in every community the quality, quantity, importance, and balance of them will be different. But most people agree that the six principles listed below, if addressed simultaneously, will build sustainability. A community can use these principles as guide to where it wants or needs to improve its sustainability, and how do it.

### 1. Quality of Life

What a community thinks of as quality of life—or “livability”—has many components: income, education, health care, housing, employment, legal rights, and exposure to crime, morality, pollution, disease, disaster, and other risks. Different communities have different things that they prize: one town may be proud of its safe streets, high quality schools, and rural atmosphere, while another thinks that job opportunities and honoring its historical heritage are what make it a good place to live. The point is that every locality can decide for itself how best to maximize the livability within its boundaries—can define and plan for the quality of life it wants and believes it can achieve, for now and for future generations. Quality of life and its applicability to recovery are discussed in Chapter 4 of this handbook.

### **The Six Principles of Sustainability**

A community that wants to become more sustainable will

1. Maintain and, if possible, enhance, its residents’ **quality of life**.
2. Enhance local **economic vitality**.
3. Ensure **social and intergenerational equity**.
4. Maintain and, if possible, enhance, **environmental quality**.
5. Incorporate **disaster resilience** and mitigation.
6. Use a consensus-building, **participatory process** when making decisions.

(adapted from Mileti 1999, p. 31)

## **2. Economic Vitality**

The people in a community need a reliable source of decent jobs. Businesses need an attractive business climate. The local government needs a stable tax base and revenue to enable it to provide and maintain the infrastructure and services that keep the community operating effectively.

Embracing sustainability in the local economy means paying attention to qualitative factors within the economy as well, not just to the bottom line. All these things are summed up in the term “economic vitality.” A community with this attribute has numerous advantages in its drive not only toward sustainability, but toward all of its other goals, whatever they may be.

A truly sustainable local economy is diversified, and less easily disrupted by internal or external events or disasters. Recovery from disaster, for example, is fundamentally an economic proposition. The success of recovery will be determined not only by how well the community attracts, effectively utilizes, and sustains the flow of investment capital from a multitude of sources through the rebuilding process, but also by the quality of the uses to which it puts that capital. Further, a vital, sustainable economy does not simply shift the costs of its good health onto other regions. Nor is a sustainable local economy reliant on unlimited population growth, high consumption, or non-renewable resources. Economic vitality and its applicability to disaster recovery are discussed in Chapter 5.

## **3. Social and Intergenerational Equity**

In an ideal community everybody gets treated fairly, regardless of ethnicity, age, gender, cultural background, or other characteristics. This means that the resources and opportunities are equally available to all, and that a few people don’t profit at the expense of others. It means making sure, to take one example, that people of limited economic means do not end up with no housing choices except for the most dangerous sites in town—that in the floodplain of the river, or over a historic toxic waste site.

One thing that present-day decisionmakers sometimes overlook is the stake that future generations have in what happens today. A sustainable community would not exhaust its resources during this generation, destroy natural systems, or pass along unnecessary hazards to its great-grandchildren. The current nuclear waste crisis is one example of how what seemed like a good idea to one generation’s scientists and policymakers may saddle future generations with exposure to hazard. Equity and its applicability to disaster recovery are discussed in Chapter 6.

## **4. Environmental Quality**

Communities are finding that the natural features of their location—a river, beach, mountain setting—can become defining points for community identity. Residents are demanding open spaces, unspoiled areas, parks, wildlife habitat, and the educational opportunities that nature can provide. In the long run, it is essential that human activities not degrade the air, oceans, fresh water, and other natural systems. A community can take a positive step toward a sustainable future by trying to replace local practices that are detrimental with those that will allow ecosystems to continuously renew themselves. In some cases, this will mean simply protecting what is already there by finding ways to redirect human activities and development into less

sensitive areas. In others, a community may have to change deeply ingrained patterns, like reliance on the automobile, in order to combat the sprawl and noise and air pollution it causes. In still other situations, a community may need to reclaim, restore, or rehabilitate an already-damaged ecosystem—like a local wetland. Environmental quality and its applicability to disaster recovery are discussed in Chapter 7 of this handbook.

## **5. Disaster Resilience**

A community has a better chance of being around in the future, of retaining its special character over time, and of being a good place for its residents to live (and stay) if it is resilient in the face of natural disasters like tornados, hurricanes, earthquakes, floods, and drought. Although such events cannot be prevented, a community can do a lot to make sure that they cause as little physical damage as possible, that productivity is only minimally interrupted, and that quality of life remains at (or quickly returns to) high levels. Further, a sustainable community would think of hazards and disasters as integral parts of the much larger environment in which it exists. It would not rely solely on outside (such as federal or state) help but instead shoulder responsibility for the risks that cannot be avoided, and for the return to normalcy after a disaster, if one does occur. Disaster resilience and its applicability to recovery are discussed in Chapter 8.

## **6. A Participatory Process**

A participatory process means seeking wide participation among all the people who have a stake in the outcome of a decision. The decisionmaker identifies concerns and issues; allows generation of ideas and options for dealing with those concerns; and helps to find a way to reach agreement on what steps will be taken to resolve them.

Engaging in a participatory process improves the quality and dissemination of information, fosters a sense of community, produces ideas that may not have been considered otherwise, and engenders a sense of ownership on the part of the community for the decision that is ultimately made. The participatory process and its applicability to disaster recovery are discussed in Chapter 3.

## **WHY SUSTAINABILITY?**

Even people who are already convinced of the usefulness of the sustainability ideal can benefit by having some arguments in its favor. Because it is a broad concept, it can mean different things to different people and that is a key selling point. There is something in it for everyone. It's a win-win proposition.

- Sustainability is a forward-looking approach as people become more closely connected, move into an increasingly global economy, realize the global nature of the environment, and have communications networks that instantaneously span the planet.
- It helps give control back to local communities. Sustainability leads communities back to self-determination by asking: What kind of lifestyle do you want and need? How can you live now so that future generations are not penalized? What do you need for an acceptable

quality of life? Should growth be limited? What environmental risks are you willing to take? How can your local government and business work together? The answers to these questions are unique to each community. With sustainability, there is no “national model” that is being imposed on a community from the outside. No one but the residents of a community know what value they place on different aspects of their lifestyle, their community. And no one but a community can really ensure that those values endure.

- The principles of sustainability promote a “Golden Rule” of behavior toward other people, toward the planet itself, and toward the future.
- Many federal agencies have been emphasizing the “livability” of cities in its activities and policies, and is able to offer support through its various programs for localities that adopt that point of view.
- Using the sustainability approach can help a community better recognize the impacts of various decisions on other community goals and concerns. It helps clarify thinking and priorities when making inevitable trade-offs.

### **The Consequences of Business as Usual**

Not incorporating sustainability into the fabric of the community can have negative consequences. After a disaster some of these consequences are easier to see. There are many instances of communities that did not rebuild wisely after a disaster, or that neglected an opportunity to include sustainability.

- If they are not addressed, many marginal local conditions will only worsen. This includes environmental conditions like deteriorating water quality and loss of natural spaces; social conditions like the unfair distribution of risk; and economic situations like loss of employment opportunities as businesses relocate to other towns.
- It's expensive for everyone when people don't have a sustainable relationship with their environment. Disaster losses are increasing nationwide; it costs all taxpayers when the federal government provides (sometimes repeatedly) large amounts of financial relief and funds for rebuilding.
- Government policies are getting stricter in terms of helping those communities that help themselves, and requiring those that haven't at least make an attempt before they get federal assistance. Communities that help themselves now will be in much better position later.

## **CONSIDERING SUSTAINABILITY AFTER A DISASTER**

In an ideal world, communities would routinely take a long-term view of the future, and build into their planning and management processes the various principles of sustainability. But the reality is that most communities have not been doing that. If a community has not yet formally

considered broader issues like environmental quality, social equity, or livability, the period of recovery after a disaster can be a good time to start. Why? Because disasters jiggle the status quo, scrambling a community's normal reality and presenting chances to do things differently.

A disaster brings some temporary changes to a community—changes that can create opportunities to build back in a better way.

- People are thinking about the problems of floods, earthquakes, landslides, tornadoes, etc, when normally they don't think about these things. This is true for residents as well as local staff and officials.
- In some cases, the disaster will have done some of the work already. For example, a tornado, earthquake, or flood may have damaged or destroyed aging, dilapidated, or unsafe buildings or infrastructure.
- A disaster forces a community to make decisions, both hard and easy.
- Technical and expert advice becomes available, from a variety of state, federal, regional, and non-profit sources.
- Financial assistance becomes available from the state and federal government agencies, both for private citizens and for the community itself.
- Programs designed to help a community mitigate disasters can be used to strengthen overall sustainability and resiliency to other social, economic, and environmental problems.

The best way to ensure that a community has a sustainable recovery from a future disaster is to prepare a comprehensive plan for a sustainable, holistic recovery. But even if a community has not prepared such a plan, there are many common-sense things that can be done during recovery that will make a community more sustainable than it was before.

When a community begins recovering from a disaster, its staff, officials, and residents face numerous tasks that have to be done. Roads and bridges may need to be rebuilt; businesses need to reopen; eroded beaches and dunes may need replenishment; housing needs repair, restoration and replacement; problems with utilities must be remedied; social and medical services have to be reinstituted; businesses need to be retained and built back. In many cases it is a relatively simple matter to do those tasks in a slightly different way so that long-term, broad benefits are maximized and future damage and disruption avoided, instead of just putting things back the way they were. When looked at in this light, those disaster-caused tasks become *opportunities* for improving the community.





How can a community take advantage of the opportunity that disaster recovery brings? The technique advocated in this handbook follows a framework for sustainable—or “holistic”—recovery in which the principles of sustainability become decisionmaking criteria to be applied to each and every recovery decision. On page 1-9 is a sample Matrix of Opportunities that can be a guide to decisionmaking for holistic recovery. The sustainability principles (and some ways of implementing them) are shown on the vertical axis. Across the top of the matrix are listed some of the problem situations that could confront a community in the aftermath of a disaster: utilities must be restored, infrastructure re-established, housing repaired, social services reinstituted, and commercial sectors rehabilitated. At the intersection of the problem and the principle there are opportunities for a recovery decision and action that would be more sustainable than a return to the status quo (marked with an X on the matrix). It should be noted that this matrix is just a sample of a hypothetical disaster in a hypothetical community. A similar matrix developed by a real community to help it in recovery would have a different list of disaster situations across the top, and a different set of boxes marked with X. The principles would be the same as in this sample, as would many of the options for applying them.

For example, the column labeled “power lines” (under “Damaged Utilities”) represents a situation in which a hurricane or other disaster has caused downed and/or damaged electric lines. Reading down that column shows that a community has several options for incorporating sustainability when it repairs or replaces those power lines. Instead of simply putting the power lines back the way they were, the community could devise a recovery strategy that calls for burying replacement power lines underground. This could improve the aesthetics of the neighborhood (thereby improving quality of life now and for future generations), alleviate visual pollution (thereby enhancing environmental quality), and minimize the chance that of future disruption to the electricity supply (thereby improving disaster resilience).

Or, the community might have a strategy that calls for upgrading and/or expanding the coverage of the power lines when they are repaired instead of just replacing them. Depending upon the specifics, this strategy could have the effect of improving the community’s utility services (thereby improving quality of life now and for future generations), supporting development or redevelopment of a new part of the community (thereby enhancing economic vitality), and encouraging development in a less hazardous area (thereby improving disaster resilience).

The options listed under each of the six principles of sustainability are by no means exhaustive; additional ideas may readily be imagined. Recovery strategies that capitalize on disaster opportunities are limited only by the imagination and resourcefulness of the community. That process is the subject of the rest of the chapters of this handbook.

### **Paying for Sustainable Disaster Recovery**

Many federal, state, and private programs provide technical and/or financial assistance to help carry out sustainability strategies. In most instances, this assistance is available in a disaster recovery situation as well as during normal conditions. There also are some government and other programs that assist in working toward sustainability after a disaster. The following chapters contain information about funding and other help community can obtain in building sustainability.

### Matrix of Opportunities

(x = an opportunity to devise a recovery strategy that furthers sustainability)

#### Some Situations a Community Could Face during Disaster Recovery

The Principles of Sustainability & Some Options for Applying Them	DAMAGED TRANSPORT			DAMAGED PUBLIC FACILITIES					DAMAGED UTILITIES			DAMAGED HOUSING		ECONOMIC DISRUPTION				ENVIRONMENTAL DAMAGE			DISRUPTION TO HEALTH & SAFETY			OTHER								
	Roads, bridges, & related infrastructure	Subway, rapid transit	Other	Schools	Downtown, CBD, historic district	Public spaces	Harbor, port, airport	Stormwater system, power plant	Other	Power lines	Phone lines	Water treatment plant	Other	Houses to be repaired	Houses damaged beyond repair	Other	Commercial buildings damaged/destroyed	Businesses disrupted	Unemployment	Loss of work force	Other	Riverine, beach, & dune erosion	Toxic air, water, soil, wellheads	Tree loss, habitat loss	Other	Medical facilities damaged	Social & family services, daycare disrupted	Victims, population traumatized	Other			
1 Maintain & Enhance Quality of Life																																
Make housing available/affordable/better					X		X			X	X			X	X					X									X			
Provide education opportunities		X			X	X												X	X									X	X			
Ensure mobility	X	X		X	X	X	X							X			X		X	X							X					
Provide health & other services					X					X									X			X	X			X	X	X				
Provide employment opportunities			X														X	X	X	X							X	X				
Provide for recreation				X	X	X	X															X	X									
Maintain safe/healthy environs	X	X		X		X		X			X			X	X							X	X	X		X	X	X				
Have opportunities for civic engagement				X	X	X	X												X			X	X					X				
Others																																
2 Enhance Economic Vitality																																
Support area redevelopment & revitalization		X		X	X	X	X	X		X	X	X		X	X		X	X		X		X				X						
Attract/retain businesses	X	X			X		X							X			X	X	X	X												
Attract/retain work force		X		X		X								X	X		X	X				X	X			X	X	X				
Enhance economic functionality	X	X		X	X	X	X	X			X						X									X	X					
Develop/redevelop recreational, historic, tourist attractions					X	X	X										X			X		X	X									
Others																																
3 Ensure Social & Intergenerational Equity																																
Preserve/conservate natural, cultural, historical resources					X	X	X	X	X		X		X									X	X	X					X			
Adopt a longer-term focus for all planning	X	X		X	X	X	X	X		X	X	X		X	X		X									X	X					
Avoid/remedy disproportionate impacts on groups	X	X		X	X	X					X		X	X			X	X	X	X		X	X			X	X	X				
Consider future generations' quality of life	X	X		X		X				X	X	X		X	X		X					X	X	X					X			
Value diversity				X	X	X	X							X	X					X							X	X				
Preserve social connections in and among groups				X	X	X								X	X					X				X			X	X				
Others																																
4 Enhance Environmental Quality																																
Preserve/conservate/restore natural resources	X	X		X	X	X	X	X		X		X		X	X							X	X	X								
Protect open space						X	X				X		X		X		X					X	X	X								
Manage stormwater						X	X				X		X		X					X		X	X									
Prevent/remediate pollution	X			X	X	X	X	X		X	X	X		X	X							X						X				
Others																																
5 Incorporate Disaster Resilience/Mitigation																																
Make buildings & infrastructure damage-resistant	X	X		X	X	X	X	X		X	X	X		X	X		X					X				X	X					
Avoid development in hazardous areas	X	X		X	X	X	X			X	X	X		X			X				X	X			X		X					
Manage stormwater						X	X			X			X		X					X		X	X									
Protect natural areas	X			X	X	X								X			X					X	X									
Promote & obtain hazard & other insurance	X			X	X					X		X	X	X	X		X	X								X		X				
Others																																
6 Use a Participatory Process	Use a participatory process in conjunction with all the other principles of sustainability, and in every disaster recovery situation in which it is appropriate.																															

### **Sticking with Sustainability**

Once a community is well along in its recovery from the disaster, it will want to periodically assess its sustainability progress.. For example, suppose that in the course of rebuilding a portion of a community's flood-damaged housing inventory, energy efficiency was incorporated into the new homes. As the years pass, the community will want to monitor the continuing energy efficiency of those structures to ensure that it is still enhancing environmental quality by reduced energy consumption. This might be done by periodically measuring the community's total and per capita energy use; or by measuring the heat loss from those buildings.

There are many ways of measuring the different aspects of sustainability within a community and a community can develop indicators that are unique to its situation. What is important is that the concept of a sustainable community is gradually integrated into the community's normal way of life.. The chapters in this manual discuss ways that different aspects of sustainability could be measured over time within a community.

## REFERENCES

- Mileti, Dennis S. 1999. *Disasters by Design*. Washington, D.C.: The Joseph Henry Press. 351 pp. Available at [books.nap.edu/catalog/5782.html](http://books.nap.edu/catalog/5782.html).
- Reid, David. 1995. *Sustainable Development: An Introductory Guide*. London: Earthscan Publications. 261 pp.
- World Commission on Environment and Development. 1987. *Our Common Future*. New York: Oxford University Press. (The Brundtland report.) Abstract available at [www.oup.co.uk/isbn/0-19-282080-X#desc](http://www.oup.co.uk/isbn/0-19-282080-X#desc).

## WHERE TO FIND MORE INFORMATION

### Training Courses and Workshops

- Federal Emergency Management Agency, Emergency Management Institute, Higher Education Project Courses. Emmitsburg, Maryland. [www.fema.gov/emi/edu/aem\\_courses.htm](http://www.fema.gov/emi/edu/aem_courses.htm) [accessed June 15, 2001] (301) 447-1233 or email Barbara Johnson: [barbara.l.johnson@fema.gov](mailto:barbara.l.johnson@fema.gov)
- “Building Disaster Resilient and Sustainable Communities.” Course developed by Raymond Burby. [www.fema.gov/emi/edu/bldcomm.htm](http://www.fema.gov/emi/edu/bldcomm.htm), [accessed June 15, 2001] This course introduces the concepts of sustainable development, resilient communities, and smart growth. Public and private sector planning are discussed. The last quarter of the class focuses on resilience, including financing resilience projects, creating resilience among vulnerable populations, and creating resilience for specific hazards.

### 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. See [www.planning.org](http://www.planning.org) [accessed June 15, 2001]

#### Center of Excellence for Sustainable Development

The CESD website is a project of the Denver Regional Office of Department of Energy’s Office of Energy Efficiency and Renewable Energy. Since 1995, the CESD website has offered users access to comprehensive resources on community sustainability. It is an excellent source for resources on sustainable development.

See [www.sustainable.doe.gov](http://www.sustainable.doe.gov) [accessed June 29, 2001]

#### Minnesota Sustainable Communities Network (MnSCN)

MnSCN, sponsored by the Minnesota Office of Environmental Assistance, seeks to “encourage networking, information exchange, and better access to assistance.” The network contains over 1500 individuals, businesses, local governments, educational institutions, and organizations who are interested in promoting sustainability in Minnesota.

See [www.nextstep.state.mn.us/index.cfm](http://www.nextstep.state.mn.us/index.cfm) [accessed June 22, 2001]

#### Redefining Progress

Redefining Progress is an organization that “seeks to ensure a more sustainable and socially equitable world for our children and our children’s children.” Information about the group’s sustainability program is available on its website.

See [www.rprogress.org](http://www.rprogress.org) [accessed June 15, 2001]

#### Sustainable Development Communications Network

In addition to over 1,200 documents about sustainable development, this website has a calendar of events, a job bank, the Sustainability Web Ring, a roster of mailing lists (listservs) and news sites dealing with sustainable development.

See [sdgateway.net](http://sdgateway.net) [accessed September 21, 2001]

### Videos, CD-ROMs, and DVDs

*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.

*Planning for Natural Hazards: Oregon Technical Resource Guide.* Oregon Natural Hazards Workshop. 2000. University of Oregon: Oregon Natural Hazard Workshop.

The purpose of the project leading to this resource guide was to “develop...technical resource guides for Oregon cities and counties to plan for, and limit the effects of, threats posed by natural hazards.” More information about the guide is available on-line at

[www.uoregon.edu/~onhw/text/projects/tfeatured.html](http://www.uoregon.edu/~onhw/text/projects/tfeatured.html) [accessed June 22, 2001]

*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](http://www.sustainable.doe.gov/disaster/impact) [accessed July 23, 2001]

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.

## Books, Articles, and Papers

Arnold, Matthew B. and Robert M. Day. 1998. *The Next Bottom Line: Making Sustainable Development Tangible.* Washington, D.C.: WRI Publications. 64 pp.

This report tries to bring sustainable development down to earth for a business audience. Its authors seek to break down the abstract ideals of sustainable development into ideas small enough to grasp and powerful enough to lead to new business opportunities. The authors offer a road map for businesses to find financial success in the solutions to our environmental and social challenges.

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 sustainable recovery process. The last chapter discusses real-life problems the planner may encounter, and an appendix contains a comprehensive list of resources. This document is available online at [www.sustainable.doe.gov/articles/RFTF1.shtml](http://www.sustainable.doe.gov/articles/RFTF1.shtml) [accessed June 15, 2001]

Berke, Philip R. and Jack Kartez. 1994. *Sustainable Development as a Guide to Community Land Use Policy: A Conceptual Framework.* HRRC Publication 37P. College Station, TX: Texas A&M University, College of Architecture, Hazard Reduction & Recovery Center. 25 pp.

The authors explore how “sustainable development” can be used to describe the common good in land use and development and present a set of principles for land use policy formation. Principles for land use policy that the report identifies are: 1) include public participation in the decisionmaking process; 2) build consensus through conflict resolution mechanisms; 3) build local decisionmaking on a realistic capacity to carry out policies; 4) recognize local rights to devise rules for guiding human settlement patterns; 5) land use policy must work in harmony

with nature and recognize the limits of ecosystems; 6) the built environment should be in harmony with people's needs and aspirations; 7) realistic land use policy must be able to alleviate local poverty and account for the least advantaged; 8) polluters, or culpable parties/corporations, must pay for the adverse affects they have imposed on ecosystems; and 9) responsible regional planning needs to be promoted.

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.

Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*. Washington, D.C.: The Joseph Henry Press. 356 pp. Available at [www.nap.edu/catalog/5785.html](http://www.nap.edu/catalog/5785.html). [accessed September 21, 2001]

This book focuses on the breakdown in sustainability that follows disaster. The authors follow the history of land use planning and identify key components of sustainable planning for hazards. The authors explain why sustainability and land use have not been taken into account in the formulation of public policy. They also lay out a vision of sustainability, concrete suggestions for policy reform, and procedures for planning. The volume has an excellent bibliography on local land use planning and management for natural hazard mitigation.

Burby, Raymond J., Timothy Beatley, Philip R. Berke, Robert E. Deyle, Steven P. French, David R. Godschalk, Edward J. Kaiser, Jack D. Kartez, Peter J. May, Robert Olshansky, Robert G. Paterson, and Rutherford H. Platt. 1999. "Unleashing the Power of Planning to Create Disaster-Resistant Communities." *Journal of the American Planning Association* 65 (Summer).

Human suffering and loss of lives and property in natural disasters can be reduced with appropriate planning for hazardous areas. However, the authors of this paper assert that federal policies addressing these problems have yet to recognize the importance of planning as the cornerstone of effective local hazard mitigation. In fact, federal programs make planning more difficult, the authors suggest, because they encourage the intensive use of hazardous land and shield local governments and private decisionmakers from financial losses in the disasters that inevitably follow. To use planning for hazard mitigation, federal policies must be revised so that they help build local understanding of risk, commitment to hazard mitigation, and support for planning.

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.

*Civil Engineering* 63(10)(October 1993): 39-76.

This topical journal issue begins with an essay by John Prendergast titled, “Engineering Sustainable Development.” Following this are nine articles that describe projects that incorporate principles and current practices used by the civil engineering profession in its efforts to achieve sustainable development. Topics explored include reusing stormwater runoff, geogrid reinforcement to solve hillside erosion, and solving local wastewater treatment problems.

Darmstadter, Joel. 1994. *Global Development and the Environment: Perspectives on Sustainability*. Washington, D.C.: Resources for the Future.

The first two essays in this volume set the stage for considering requirements to develop sustainably by, first, explaining the problem of global population growth, and second, discussing how to move from sustainability as a concept to a reality. The remainder of the essays in the book discuss individual issues such as fairness; practical difficulties; the future of specific natural resources such as water, agriculture, and energy; climate variability and its effect on agriculture; climate change and carrying capacity; and biodiversity and carrying capacity.

Federal Emergency Management Agency. 1997. *Project Impact Guidebook. Building a Disaster Resistant Community*. Washington, D.C.: U.S. Government Printing Office.

This handbook is designed to help communities protect residents, organizations, businesses, infrastructure, and stability and growth of the economy as much as possible against the impact of natural disasters before they happen.

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 [http://www.fema.gov/mit/planning\\_toc.htm](http://www.fema.gov/mit/planning_toc.htm) [accessed September 21, 2001]

This booklet is about hazard mitigation, disaster resilience, 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 resilience 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](http://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.



Hart, Maureen. 1999. *Guide to Sustainable Community Indicators*. 2nd edition. North Andover, MA: Hart Environmental Data. 202 pp.

The document identifies indicators of sustainable community: ways to measure how well a community is meeting the needs and expectations of its present and future members. The author explains what indicators are, how indicators relate to sustainability, how to identify good indicators of sustainability, and how indicators can be used to measure progress toward building a sustainable community. A website contains the information in the document, plus links and contact information for sources of assistance and advice, along with a list of communities in the United States that are developing indicators of sustainability: [www.sustainablemeasures.com](http://www.sustainablemeasures.com) [accessed June 15, 2001]

Krizek, Kevin J. and Joe Power. 1996. *Planners Guide to Sustainable Development*. Chicago, IL and Washington, D.C.: APA Planning Advisory Service. 66 pp.

This report urges planners to incorporate sustainable development objectives into their everyday work. It describes the history, concepts, and theories behind sustainable development; evaluates progress at the global, national, and state levels; and proposes strategies to help planners become more actively involved in local sustainable development programs. The book includes case studies of sustainable development initiatives in five communities.

May, Peter J., Raymond J. Burby, Neil J. Erickson, John W. Handmer, Jennifer E. Dixon, Sarah Michaels, and D. Ingle Smith. *Environmental Management and Governance: Intergovernmental Approaches to Hazards and Sustainability*. New York: Routledge. 254 pp.

The book addresses aspects of environmental management that raise fundamental questions about human actions and government roles. The authors examine “cooperative” and “coercive” governments by comparing policies in New Zealand and Australia with the more coercive and prescriptive approaches used in the U.S. They also focus on how the different regimes influence choices by local governments about land use and development in areas subject to natural hazards. Separate chapters are devoted to growth management in Florida, resource management in New Zealand, and flood management in New South Wales. Other chapters describe how policy design is implemented, the role of regional governments, policy compliance and innovation at the local planning level, strategies for sustainable development, and examine the outcomes of cooperative policies.

Mazmanian, Daniel A. and Michael E. Kraft, eds. 1999. *Toward Sustainable Communities: Transition and Transformations in Environmental Policy*. Cambridge, MA: The MIT Press. 322 pp.

This book reviews and assesses environmental policy over the past three decades, primarily in the United States but with implications for other nations. The editors place U.S. environmental policy within the framework of the transition from 1970s-era policies that emphasized federally controlled regulation, through a period of criticism and efficiency-based reform efforts, to an emerging era of sustainability in which decisionmaking takes place increasingly at the local and regional levels. The book looks at what does and does not work and how social, economic, and environmental goals can be integrated through policy strategies grounded in the concept of sustainability.

McElfish. 1999. *Sustainability in Practice*. Washington, D.C.: Environmental Law Institute Research Publications.

As sustainable development becomes one of our nation's top priorities, how are U.S. communities envisioning and implementing their sustainability goals? This report identifies trends in community sustainable development efforts based on nearly 600 applications for the U.S. Environmental Protection Agency's Sustainable Development Challenge Grant Program. It features a variety of charts and graphs that identify popular subject areas, partnerships, the urban and rural breakdown, tools, and goals of these projects. It also includes descriptions of funded projects.

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

National Research Council. 1999. *Our Common Journey: A Transition toward Sustainability*. Washington, D.C.: National Academy Press. 363 pp.

This report of the National Academy of Sciences' three-year Global Commons Project documents large-scale historical currents of social and environmental change and reviews methods for "what if" analysis of possible future development pathways and their implications for sustainability. The book also identifies the greatest threats to sustainability—in areas such as human settlements, agriculture, industry, and energy—and explores what the Board perceives to be the most promising opportunities for circumventing or mitigating these threats. It goes on to discuss what indicators of change, from childrens' birth-weights to atmospheric chemistry, will be most useful in monitoring a transition to sustainability.

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.

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](http://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. National Science and Technology Council. 1994. *Technology for a Sustainable Future: A Framework for Action*. Washington, D.C.: U.S. National Science and Technology Council. 154 pp.

This report summarizes the Clinton White House's plan for developing a comprehensive environmental technology strategy. It examines the use of environmental technologies to facilitate long-term environmental, energy, and economic goals and asks for suggestions for improving federal policies related to advancing environmental technologies. It includes a section on technology needs for natural disaster reduction. The document also provides examples of avoidance, monitoring and assessment, and remediation and restoration. Appendices contain lists of federal sources for agency offices (names, contact information) and online data 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.

Wilhite, Donald, Deborah A. Wood, and Kelly Helm Smith. n.d. *Planning for a Sustainable Future: The Case of the North American Great Plains*. IDIC Technical Report Series 95-1. Lincoln, Nebraska: International Drought Information Center.

The participants at this symposium addressed the complex economic, social, and environmental issues facing the Great Plains region in anticipation of climate change in the years to come. In addition to essays on sustainable development and global change policies, the volume contains four case studies that deal with sustainable land use, education and research agendas, the Groundwater Guardian Program, and the use of reverse engineering to enhance the lessons learned over the past eight decades. Also included are focus group reports on agricultural production, land and water resources, human and community resources, biological resources and biodiversity, and integrated resource management.

World Bank. 1994. *Making Development Sustainable*. Environmentally Sustainable Development Occasional Papers Series. Washington, D.C.: The World Bank: The International Bank for Reconstruction and Development. 270 pp.

Eight essays attempt to capture current thought on a number of key conceptual, methodological, and practical issues. The authors cover poverty and the environment; gender and ecosystem

management; the sociologist's, economist's, and ecologist's approaches to sustainable development; the integration of environmental concerns into development policy making; the World Bank's agenda for the environment; and an epilogue regarding the expansion of capital stock.

World Commission on Environment and Development. 1987. *Our Common Future*. Oxford, UK: Oxford University Press.

In 1983, the World Commission on Environment and Development was asked by the United Nations General Assembly to formulate "a global agenda for change." This document, also known as the Brundtland Report, is the report of the Committee chaired by Gro Harlem Brundtland. The Committee undertook to: 1) propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond; 2) recommend ways concern for the environment may be translated into greater cooperation among developing countries and between countries at different stages of economic and social development and lead to the achievement of common and mutually supportive objectives that take account of the interrelationships between people, resources, environment, and development; 3) consider ways and means by which the international community can deal more effectively with environmental concerns; and 4) help define shared perceptions of long-term environmental issues and the appropriate efforts needed to deal successfully with the problems of protecting and enhancing the environment, a long-term agenda for action during the coming decades, and aspirational goals for the world community.

## Additional Reading

Beatley, Timothy. 1995. *Planning and Sustainability: The Elements of a New (Improved?) Paradigm*. HRRC Publication No. 132A. College Station, TX: Texas A&M University, College of Architecture, Hazard Reduction & Recovery Center. 13 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.

Clark, William C. 2001. "America's National Interests in Promoting a Transition to Sustainability: Issues for the New U.S. Administration." *Environment* 43(1)(January/February):18-27.

Reid, David. 1995. *Sustainable Development: An Introductory Guide*. London: Earthscan Publications. 261 pp.

