

Brownfields and Greenfields: The Intersection of Sustainable Development and Environmental Stewardship

Joseph W. Dorsey

The recent growth of urban brownfield redevelopment and greenfield protection initiatives is a positive indicator of the redirected priorities of the public and private sectors to restore and regenerate sustainable places and spaces in the American landscape. Concepts such as “sustainable development” and “environmental stewardship” are universal ideals, achievable goals, and intergenerational necessities that have practical applications. This article suggests that brownfield redevelopment and greenfield protection are land use strategies that emphasize long-term sustainability goals rather than unrestrained economic growth and resource expansion. Brownfield initiatives are deeply intertwined with community economic redevelopment and job creation, and they are also important aids in health and safety issues, neighborhood restoration, and the reuse of urban space to counter suburban sprawl into green, open spaces. Planning processes such as “smart growth” and “urban infill” help to better manage development and slow down sprawl. Central to smart growth are brownfields and infill development, because smart growth strives to use underdeveloped areas within the urban environment more efficiently. Urban infill, such as brownfields redevelopment, holds the promise of enabling cities and communities to grow and evolve over time through many incremental changes. By creating places of enduring value and by restoring and reusing buildings and other urban spaces, we can build common ground between sustainability and historic preservation efforts, and provide alternatives to developing greenfield sites.

Environmental Practice 5:69–76 (2003)

The recent growth of urban brownfield redevelopment and greenfield initiatives is a positive indicator of the redirected priorities of the public and private sectors to re-

store and regenerate sustainable places and spaces in the American landscape. The United States Environmental Protection Agency (USEPA), which defines brownfields as “. . . real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant” (US Environmental Protection Agency, 2002), recently estimated that there are between 450,000 and 600,000 brownfield sites across the country (US Environmental Protection Agency, 1999). The word “brownfield” is meant to contrast with the word “greenfield,” which is a previously undeveloped piece of land. Greenfields are generally parklands, underdeveloped open spaces, or agricultural land, located near the outskirts of towns, cities, and larger metropolitan areas (Great Lakes Greenfields Exchange, 2002).

This article suggests that the current societal interest and investment in brownfields and greenfields are strongly linked to the process-oriented idea of “sustainable development.” Sustainable development is a growing movement that gained national attention with the creation of the President’s Council on Sustainable Development in 1993. Sustainable development is usually tied to some scope of economic development, whether local, regional, or national. However, there is an inherent problem in defining sustainable “development,” since development is usually defined principally in terms of economic growth (Redclift, 1987). Some believe that allowing the free market system to operate on its own allows sustainable development to perhaps occur on its own, while others believe that development can occur only by scaling back industrialization (Laswell, 2000). In a lively conversation at the National Town Meeting for a Sustainable America held in Detroit, Michigan, in May of 1999, leaders from General Motors, Detroit Edison, Interface, Inc., Ford Motor Co., The Calvert Group, Stonyfield Farm Yogurt, and Dow Chemical shared their perspectives on the role of business in sustainable development. Most CEOs felt that sustainable development gave their companies a competitive advantage by meeting the “triple bottom line” (e.g., a strong economy, healthy environment, and an equitable society) and through better partnerships among business, communities, and government (National Town Meeting for a Sustainable America, 1999).

Affiliation of author: School of Interdisciplinary Studies, Miami University, Oxford, Ohio

Address correspondence to: Joseph W. Dorsey, PhD, School of Interdisciplinary Studies, Miami University, 106 Peabody Hall, Oxford, OH 45056-1981; (fax) 513-529-5849; (e-mail) dorseyjw@muohio.edu.

© 2003 National Association of Environmental Professionals

However one perceives the notion of sustainable development, there is generally an “interconnectedness” that ties people to natural resources and the environment in some crucial way.

Although initial talk of sustainable development emerged in the 1960s and 1970s, it was the Massachusetts Institute of Technology study commissioned by Club of Rome’s *Predicament of Mankind* in 1972 that drew attention to the growing disequilibrium of resources, population, production, and consumption between developed and underdeveloped countries (Meadows et al., 1972). This study, published under the title *The Limits to Growth*, led to two decades of vigorous debate and research attempting to confirm or refute the pessimistic conclusions (Johnson, 1995; Loucks et al., 1999). Then in 1987, the United Nations World Commission for Environment and Development released the highly influential report *Our Common Future* (World Commission for Environment and Development, 1987). Called the Brundtlandt Report after the commission’s chair, Norwegian Prime Minister Gro Harlem Brundtlandt, it emphasized the connections between problems of growth, economics, technology, and the environment (Johnson, 1995). Growth in an economy does not necessarily mean development, and technological fixes do not always cure environmental ills and often make ecological problems worse. As a solution, the report forwarded the idea of “sustainable development” as a means of meeting the needs of the present without compromising the ability of future generations to meet their own needs. While the Brundtlandt vision of a sustainable future is idealistic, ethical, and hopeful, current brownfield redevelopment initiatives and greenfield protection projects offer practical, complementary, and sustainable solutions to handle land- and property-based environmental and economic problems in this country.

At first glance it would seem that abandoned buildings on contaminated urban sites and rural landscapes have little in common with each other and nothing to do with sustainable development, but closer observation reveals that these two aspects of land use are intrinsically connected by factors such as suburban expansion, pollution, and local economic development. Loucks et al. (1999) consider sustainable development a form of enterprise that neither extracts resources at a rate faster than they can be renewed nor disposes of wastes in amounts beyond the carrying capacity of natural systems to assimilate them. By that definition, brownfields and greenfields fit neatly into the sustainable development paradigm. Both brownfield redevelopment and greenfield protection are land use strategies that emphasize long-term sustainability goals rather than unrestrained economic growth and unregulated resource expansion.

Sustainability is a concept that can be defined in many ways, depending upon a society’s perception of current material needs and the actual material needs of future generations. Naturally, there is difficulty in striking a balance between addressing immediate concerns and taking into consideration how decisions made in the present will impact conditions in an intangible future. There is clearly an imperative to think realistically about the notion of sustainability in contemporary society since we have entered into what some would label a “post-materialist” stage of economic development (Milani, 2000). Since the dawn of the Industrial Revolution the historical materialism of capitalistic wealth accumulation, while liberating people from nature’s domination over human survival, has created socioeconomic systems that eventually modified, exploited, damaged, and destroyed natural systems, and thus natural capital, in the name of human progress (Costanza et al., 1997). Because natural resources are finite, exploitation of raw materials without limits can easily degrade ecosystems and stifle economic growth. An evolving “culture of sustainability” is necessary to assure an equitable resource distribution and a thriving, viable global economy for decades to come. Many citizens/consumers understand the importance of a sustainable future and demand from government and industry the appropriate policies, technologies, and services that will address the demands of the present without compromising the needs of the future. In this sense, the notion of sustainability is becoming an emerging worldview.

The concept of sustainability has its roots in biology, where “a sustainable system is one which survives or persists” (Costanza et al., 1997). Sustainable systems may entail natural ecosystems, such as streams and watersheds, or the maintenance of non-renewable resources such as oil, coal, and minerals and renewable resources such as forests, farms, and fisheries. As an economic term, “sustainability” means avoiding major disruptions, collapses, instabilities, and discontinuities in monetary and financial markets. Some definitions of sustainability imply preservation of the status quo by simply protecting and ensuring that the conditions of the present are not diminished in the future (Beatley and Manning, 1997). The essence of sustainability is its focus on temporality, particularly longevity. And, ethically, it is an obligation to our children and their children to pass on a planet where both the natural and built environments are of a higher quality and condition than when we encountered them. Fundamentally, sustainability is about establishing long-term strategies and a global ethic in regard to how efficiently our advancing society is going to utilize and manage the natural resources we harness and the synthetic resources we create. Sustainability encourages livable commu-

nities, protects vital land, reverses unsustainable transportation trends, and conserves energy and non-renewable resources.

Some people may be skeptical about our ability to successfully meet the challenges of sustainable living due to the relentless drive of a capitalist consumer culture and current global trends of population growth, consumption, and environmental degradation. But the idea of sustainability can help frame issues in a manner that shows industry, political officials, and the general public that policies and processes that are designed to “close cycles and loops” are good business practices over the long term. Just as the business sector can be a powerful opponent, it can also be a powerful ally in community economic development. Because industry is a principal source of environmental problems, it can, in turn, be a principal source of solutions (Johnson, 1995). Essentially, a healthy, stable economy depends greatly on a healthy, stable environment. If the economy and the environment are unstable and degraded, we must seek opportunities to repair and replace parts of these systems that need fixing and preserve resources as well as protect places that need protection from overuse and exploitation. And we as a society must address the existence of crumbling infrastructures in our built environments where there are important preexisting spatial foundations to build or rebuild upon.

In this sense, *brownfield redevelopment* is a relatively new term for an old problem. Since the 1970s, businesses have been leaving urban areas in order to build on cheaper real estate and/or to cluster in industrial parks. Many of these companies were polluting industries that left behind abandoned structures containing pollutants and hazardous waste in storage or in the local soil and water. Residents and wildlife living in close proximity to these contaminated sites may have suffered adverse health effects as a result. For many years, society has struggled with decisions over what to do with abandoned and contaminated industrial sites in urban, as well as rural, areas. In the past, such facilities were primarily fenced off from the public and left alone. Cleanup and/or renovation were also options, but the aspect of liability made it hard to redevelop a site since no one wanted to take responsibility for the cost of cleanup or be liable for any damage to private property, ecosystems, or human health.

In 1993, the Brownfield Initiative was developed by the Clinton-Gore administration to clean up abandoned, lightly contaminated sites and restore them to community use. Since its creation, the initiative has awarded over 500 grants to communities nationwide, totaling over \$140 million. These grants have resulted in the creation of nearly 7,000 jobs, and have

leveraged over \$2.3 billion in private investment (Faber and McCarthy, 2001).

Federal, state, and local governments also recognized the private sector's need for assistance, and have put in place a wide variety of government initiatives to mitigate the risk to brownfield developers, such as block/formula grants; direct loans; guaranteed/insured loans; insurance; project grants; sale, exchange, or donation of properties and goods; the Superfund Trust Fund; and a technical assistance program for local bodies to facilitate various processes (Bartsch et al., 2001). President George W. Bush signed the Small Business Liability Relief and Brownfields Revitalization Act on January 11, 2002, in order to reform the federal Superfund law that has often hindered brownfield cleanups. The Act provides liability protection for prospective buyers, contiguous property owners, and innocent landowners. It also authorizes increases in funding for state and local programs that assess and clean up brownfields (US Congress, 2001).

At the state and local levels, many viable and innovative approaches have been put into place to meet the multiple challenges and common objectives of brownfield reuse. After a surge of early activity, many states started settling in to their voluntary cleanup programs, finalized policies and rules, and allowed the programs to take hold and operate at the project level. In recent years, many states have initiated new programs, while others modified existing programs to reflect the status of brownfield sites in their areas.

People interested in the economic viability of older urban areas are attracted to brownfields because such properties represent unrealized potential. Whether once small gas stations or giant factory sites, many argue that if brownfields can be made productive again, they will create jobs and tax revenues, and they will attract economic activity back into already developed areas. Across the country, elected officials and program administrative staffs have made numerous efforts to ensure that their programs optimally reflect local brownfield needs by taking advantage of opportunities to link brownfield cleanup and redevelopment assistance with regulatory incentives (Bartsch et al., 2001). Clearly, turnarounds in tax bases and changes in employment opportunities can stimulate brownfield redevelopment while preserving greenfields from new development.

Brownfield initiatives were established to clean up contaminated, abandoned industrial sites, implement profitable business operations, and revitalize community economic development with jobs and other financial incentives. For those in the private sector, brownfields are opportunities for

investors, developers, and entrepreneurs to “buy commercial and industrial properties at below market price, clean them up at a lower cost, obtain financial, regulatory and technical assistance for the projects and make handsome profits” (Verbit, 2001). In addition, state and local governments are entitled to various forms of assistance and a variety of economic incentives to redevelop brownfields, such as “grants, tax exemptions or abatements, low-interest loans, waiver of impact and permit fees, faster development approvals and marketing, and promotional assistance” (Verbit, 2001). The redevelopment aspect creates economic viability and investment. This can be good for local economies and has tremendous potential benefits for cities with struggling economies. In April 1999, in the US Conference of Mayors’ widely cited survey of cities, 155 cities estimated that total tax revenues could reach between \$955 million and \$2.7 billion per year, and 168 cities estimated more than 675,000 jobs could be created, if these cities’ brownfields were redeveloped (Verbit, 2001). These are huge and significant estimates of the economic potential of brownfields to the nation.

While brownfield initiatives are deeply intertwined with community economic redevelopment and job creation, they are also important regarding health and safety issues, neighborhood restoration, and the reuse of urban space to counter suburban sprawl. In urban areas, many low-income or minority communities are concerned about multiple pollution sources that may expose residents to unacceptable amounts of environmental contamination. These communities want plans that promote both economic redevelopment and cleanup initiatives. Brownfield plans must be addressed in such a way that they do not compromise the environmental health and well-being of local residents. The social inequities of race, ethnicity, education, and class still pose barriers to more inclusive urban and regional planning and development. *Environmental justice* seeks to address the problem of certain demographic groups receiving disproportionate exposure to hazardous substances due to their proximity to industrial areas and contaminated sites; these communities are usually low-income or minority populated (Szymecko and Voice, 2002). As a discourse, environmental justice has sought to address the socio-environmental needs of the powerless and disenfranchised. Still, some government officials believe that environmental justice policies prohibit economic development in some cities with brownfield sites. Restrictions on business development proposed by the USEPA in at-risk areas (due to potential environmental impacts) are considered likely to hurt job prospects for residents of so-called “brownfield communities.” There is no proof that environmental justice activism will keep renewal efforts away, however, and

there is a strong belief in some municipalities that the economic benefits of corporate growth and development in their cities, through brownfield redevelopment, will “trickle” down to neighboring communities.

In theory, brownfield redevelopment involves large-scale efforts to revitalize economically depressed communities in order to attract new businesses and continued community development. This expectation suggests that all stakeholders should be included in the decision-making process, but this is not always the case. Public opposition can be strong if there is a perception of inequitable, non-inclusive, and demographically biased site evaluation. Traditionally, corporate decision making has rarely included significant feedback from local residents. Most decisions on industrial siting took place away from public scrutiny and involved government officials and other bureaucrats, developers, property owners, zoning boards, contractors, bankers, investors, consultants, planners, brokers, accountants, and lawyers—but rarely local residents, the primary stakeholders. Brownfield sites are the nexus for understanding the need for the integration of collaborative decision making with the inclusion of interested local stakeholders.

Neglecting the opinions and needs of residential communities in the past has, on occasion, incited activist protest and/or litigation against companies that were perceived as ethically insensitive to the environmental risk factors they were introducing to the area. Environmental considerations may be either inadequately or inordinately weighted relative to other considerations, depending on the values of the decision maker and the political environment within which the decision is made. Sankar (1991) suggests that “[t]he more ethical the values in the decision-making process, the more dynamic the organizational culture in promoting trust, integrity, and harmony.” Corporate and governmental recognition of the contributions of local community input and inclusion in the decision-making process can provide an opportunity for members of the community to contribute ideas, opinions, and control as equal stakeholders, thus avoiding opposition later. Restoration of a community’s economic and social viability and environmental quality through brownfield redevelopment can be a form of reparation for previous systemic inequities. The ideal brownfield project or program is one in which the community, local government, and public and private sector objectives are met in a win/win scenario. This is most easily accomplished by good communication with and among stakeholders through letters, mailings, and the Internet. Restoring trust, collaboration, and cooperation between corporate decision makers and residential stake-

holders is essential to truly invigorate and sustain long-term community economic development.

Urban sprawl is another public concern that brownfield redevelopment addresses. Low-density, sprawling growth patterns have characterized the urban and suburban development of the United States since the post-World War II period. It is becoming increasingly clear that many of the problems of American cities and regions stem from current patterns of growth that are land-consumptive, environmentally damaging, and developmentally unsustainable. Dozens of cities and counties across the nation have adopted urban growth boundaries in order to contain development in existing areas and prevent the spread of suburbanization to outlying and/or rural areas (greenfields).

As metropolitan areas expand, developers are willing to pay farmers higher prices for nearby agricultural land. As outlying agricultural lands are developed, the unique characteristics and quality of life of the rural environment become increasingly compromised by traffic congestion, housing developments, more roads, car-dominated boulevards, parking lots, and miles of strip malls. Meanwhile, the urban centers and older suburban areas get caught in a cycle of neglect, degradation, and abandonment, which continues to motivate development to move on and relocate, literally, in “greener pastures” (Pebbles and Hackett, 1999). Increasingly, people are becoming interested in fleeing the emergent congestion, crime, and high cost of urban life to escape to the quieter, safer, and more affordable rural areas and urban fringes. Due in part to the vast extension of transportation systems beyond the urban fringe, workplaces for many people are increasingly being located in the suburbs. In many areas of the country, rural jurisdictions lack the planning resources and physical infrastructure to support this kind of “ex-urban” growth. This growth then exacerbates existing fiscal restraints for local governments and often contributes to problems with water quality, air quality, and other key natural resources (Johnson and Scott, 1997). But cities have to go somewhere, and many see the growth as a sign of a healthy economy.

However, continuous and unchecked growth in metropolitan areas has created a land use phenomenon called urban sprawl. Sprawl is scattered, unplanned, low-density residential and industrial development that spreads out from established urban regions, converting woodlands, wetlands, agricultural lands, and other natural habitats to urban uses. Sprawl patterns of land development are characterized by one- or two-story single-family and multi-family residential homes accompanied by strip commercial centers and indus-

trial parks. According to Burchell (1997), this type of development is favored by the general public because it minimizes congestion while accommodating unlimited use of the automobile, places new development at a distance from the fiscal and social problems of older core areas in cities, provides for a heterogeneous economic mix, fosters neighborhoods in which housing and housing values will appreciate, and requires lower property taxes to pay for local school district operating expenses than in locations closer to and within the cities.

For developers, the process of sprawl is facilitated by an abundance of available land that is inexpensive and easy to develop for commercial and/or residential use. For local governments, sprawl development leads to high public expenditures due to the inefficiencies involved in developing public infrastructure such as new roads, schools, and sewer, water, and power lines. These expenditures include not only the capital cost of providing facilities, but also the operational cost and maintenance cost. These land development costs are usually supported by the population at large through state and local taxes, but over the last decade, land development has sought to shift these costs to more specific parts of the population. This shifting of costs has occasioned a careful look at what contributes to these costs, and whether they can be lessened. But what about environmental costs? How will we share the costs of environmental degradation and loss of open space? What is to be done about the ecological footprints we leave across the American landscape in our quest to subdue the land in the name of progress?

In recent years, it has become apparent that much of the farmland and natural areas in the US are rapidly being consumed by the encroachment of new residential and light industrial development into these rural places and green spaces. Land in the US is being consumed at three times the rate of household formation, automobile use is growing twice as fast as the population, and prime agricultural land, forest, and fragile lands encompassing natural habitats are increasing at comparable reciprocal rates (Landis, 1995). Studies show that every hour, 50 acres of prime farmland are lost to development. Between 1970 and 1990, the populations of Chicago and Cleveland fell, but land development increased by over 33% (Shklyanoy, 1999). As a result of the concern for societal, economic, and environmental costs and other negative externalities of developmental sprawl, public transportation and city planners are beginning to look at alternatives to these land-consuming patterns of growth.

Concepts such as “smart growth” and “urban infill” help to better manage and sustain urban and suburban landscapes.

Smart growth is a movement that is focused on reducing urban sprawl. Its proponents are typically active at the local level, getting involved in the planning and zoning processes. Brownfield redevelopment projects are generally supported by smart growth advocates because reuse of existing properties prevents additional greenfield development and thus reduces sprawl (Szymecko and Voice, 2002). Portland, Oregon, was one of the first major cities to implement smart growth policies in the early 1970s. A 1973 state law required cities in Oregon to develop land-use plans and establish designated “growth boundaries” in order to channel growth rather than let it spread. An elected regional government called Metro Portland was established in 1979 to coordinate development with 24 different localities and to prevent developers from picking up cheap land on the outskirts. An efficient light rail system was established that is still in use today (Brownfield News, 1999).

In Maryland, the Smart Growth and Neighborhood Conservation Initiative was the country’s first incentive-based statewide effort to reduce sprawl. The four-part plan included tax credits for employers who could create new jobs in the city centers, and mortgage credits to assist people who live near their work. A land preservation rural legacy program established green boundaries around large growth areas, as well as a brownfield initiative to attract new businesses (Brownfield News, 1999). As can be construed from the above examples, smart growth strives to serve all sectors, including communities and the environment. It includes everything from soft strategic planning to hard economic penalties, from brownfields revitalization to greenfield protection.

Central to smart growth are urban infills such as brownfields, because smart growth efforts in conjunction with brownfields redevelopment help form *sustainable communities*. In the sustainable community, greater attention is paid to using those lands already committed to the urban environment more efficiently. The goals of sustainable communities are complementary and supportive of downtown and urban renewal efforts, so that the focus is on the use and reuse of already committed or available land rather than consuming, destroying, or wasting important natural and open lands on the periphery (Beatley and Manning, 1997). As mentioned earlier, reusing urban lands can help improve and invigorate urban areas. Urban infill, such as brownfields redevelopment, holds the promise of enabling cities and communities to grow and evolve over time through many incremental changes. By creating places of enduring value and by restoring and reusing buildings and other urban spaces, we can build com-

mon ground between sustainability and historic preservation efforts. Evidence suggests that there is great potential for new ecological growth and sustainable economic development through infill, as an alternative to developing “greenfield” sites.

The creation of vibrant and active urban spaces is surely a part of making places more livable. If cities are made more livable and sustainable, then vitality will return, along with stability. This restoration is possible only if economic, social, and environmental quality issues are synergistically addressed by the public, private, and communal sectors. Economic factors can include investments in the empowerment, renaissance, and enterprise zones, brownfields redevelopment, greenfields protection, well-paying jobs, affordable housing, property ownership, and the redistribution of resources to the poor, as well as finding ways to regenerate financial resources and social capital in disadvantaged neighborhoods (Beatley and Manning, 1997).

What must remain central to human consciousness is the struggle to resume responsibility, advocacy, and accountability for environmental stability and economic viability in our society. Concepts such as *sustainable development* and *environmental stewardship* are universal ideals, practical goals, and intergenerational necessities. In a post-industrial context, sustainable development implies “a new, healthier balance to how we conduct human affairs, one that celebrates depth along with surfaces, community along with individuality, spirituality along with materialism, art along with linear technique” (Frankel, 1998). For the human species, sustainable evolution may be a logical successor to the industrial revolution.

Before we can fully focus on economic sustainability and ecological stewardship, we need to restore damaged and contaminated urban communities and surrounding ecosystems. As humans and stewards of nature, we must assume full responsibility and accountability for the health of the environment and the planet’s renewable resources. Stewards are more than managers in that they are obligated to hold something in trust for another. Thus, stewardship implies a fiduciary responsibility to all stakeholders, including future generations (Loucks et al., 1999). Environmental stewardship is relevant to the recovery, restorative, and redistributive aspects of the smart growth movement, urban infill initiatives, and community redevelopment efforts (Beatley and Manning, 1997). As environmental professionals, we must see our roles as stewards of the environment and take ownership of our common future as human beings. Not everyone can be a leader, but we

can all be stewards, responsible for the betterment of all people.

There is no question that the responsibility of creating a sustainable future is a multi-leveled and multi-phased endeavor. This brief but extensive history of environmentalism should prepare us for the ecological and resource challenges that await us in the 21st century. Ultimately, the business and corporate sectors have tremendous rights and responsibilities to bear in helping achieve and sustain “disaccumulation” economies in post-industrial societies. While some corporations are seeking greater freedom from accountability, others are acknowledging their social responsibilities and stewardship roles. Many corporate leaders are stressing the need to be good citizens in the communities in which they operate, in order to strengthen their economic base and serve the public. Of course, this capitalist ideology is still based on sound business principles such as free-market mechanisms, competition, consumer confidence, economic growth, and profit. Among the informed citizenry, significant environmental concerns have affected the basic values and attitudes of society in general about the philosophies and operations of corporate entities, and the process of organizational change.

But we must broaden the environmental discourse to include brownfield redevelopment and greenfield protection. The recovery and redevelopment of brownfields can potentially benefit natural environments. Protecting biomes and ecosystems can also protect the public health in a sustainable community. In this sense, cities should strive to live off of ecological interest and to protect their ecological capital, protecting and restoring diversity in the environment. While some may feel that environmental issues are irrelevant or minor compared to other social problems, they are all related, although perhaps in subtle ways. The consequences of environmental pollution and toxic exposure cannot be ignored; these problems spread from community to community among humans, as well as plants and animals. Record changes in temperature and climate, rising incidences of cancers, and unstable energy prices—these are just a few examples of environmental impacts that affect peoples’ lives daily, and that accrue economic and social costs. Although the present economic system is still deeply entrenched in capital accumulation and raw material use, the continuance of civilization depends greatly on how effectively we conserve our resources and develop effective, long-term alternatives to the limited, degenerative, and unsustainable forms of production, consumption, and waste generation that exist today. The scope of our environmental responsibility is both local and global, and stretches generations into the future.

References

- Bartsch, C., R. V. Colangelo, K. Kastman, and B. Rasher. 2001. *Brownfields: A National Perspective*. Brownfield News, Inc., Chicago, IL, 44 pp.
- Beatley, T., and K. Manning. 1997. *The Ecology of Place: Planning for Environment, Economy, and Community*. Island Press, Washington, DC, 265 pp.
- Brownfield News. 1999. Programs that Work. *Brownfield News* 3(3):11.
- Burchell, R. 1997. *Fiscal Impacts of Alternative Land Development Patterns in Michigan: The Cost of Current Versus Compact Growth*. Southeast Michigan Council of Governments (SEMOCG), Detroit, MI.
- Costanza, R., J. Cumberland, H. Daley, R. Goodland, and R. Norgaard. 1997. *An Introduction to Ecological Economics*. St. Lucie Press, Boca Raton, FL, 275 pp.
- Faber, D. R., and D. McCarthy. 2001. *Green of Another Color: Building Effective Partnerships between Foundations and the Environmental Justice Movement*. A Report by the Philanthropy and Environmental Justice Research Project. Northeastern University, Boston, MA.
- Frankel, C. 1998. *In Earth's Company: Business, Environment and the Challenge of Sustainability*. New Society Publishers, Gabriola Island, British Columbia, Canada, 223 pp.
- Great Lakes Greenfields Exchange. 2002. <http://www.glc.org/green>. Accessed January 17, 2002.
- Johnson, H. D. 1995. *Green Plans: Greenprint for Sustainability*. University of Nebraska Press, Lincoln, NE, 210 pp.
- Johnson, T. G., and J. K. Scott. 1997. The Changing Nature of Rural Communities. In *Increasing Understanding of Public Problems and Policies*. Farm Foundations, Oak Brook, IL, 177–188.
- Landis, J. D. 1995. Improving Land Use Futures: Applying the California Urban Futures Model. *Journal of the American Planning Association* 61(4): 438–457.
- Laswell, D. L. 2000. Sustainable Development. *Environmental Protection* 11(1):45–50.
- Loucks, O. L., O. H. Erekson, J. W. Bol, R. F. Gorman, P. C. Johnson, and T. C. Krebiel. 1999. *Sustainability Perspectives for Resources and Business*. Lewis Publishers, Boca Raton, FL, 373 pp.
- Meadows, D. H., D. L. Meadows, J. Randers, and W. W. Behrens III. 1972. *The Limits to Growth*. Universe Books, New York.
- Milani, B. 2000. *Designing the Green Economy: The Postindustrial Alternative to Corporate Globalization*. Rowman & Littlefield, Lanham, MD, 235 pp.
- National Town Meeting for a Sustainable America. 1999. Executive Summary, Detroit, Michigan, and Points Across America, May 2–5.
- Pebbles, V., and K. Hackett. 1999. *New Initiatives in Farmland Preservation*. Great Lakes Commission's ADVISOR newsletter (May/June).
- Redclift, M. 1987. *Sustainable Development: Exploring the Contradictions*. Methuen, London.
- Sankar, Y. 1991. *Management of Technological Change*. John Wiley & Sons, Inc., New York, 374 pp.
- Shklyanoy, P. 1999. Lives in the Balance: Smart Growth Can Be a Positive Way to Combat Urban Sprawl. *Brownfield News* 3(3):10–13.
- Szymecko, L. A., and T. C. Voice. 2002. *Brownfield Redevelopment Guidebook for Michigan*. Brownfield News, Inc., Chicago, IL, 68 pp.
- US Congress. 2001. *Small Business Liability Relief and Brownfields Revitalization Act of 2001* (PL 107-118, 11 January 2002), 115 *United States Statutes at Large*, 2356–2381.

US Environmental Protection Agency. 1999. *Key Issues in Brownfields Debate: Report on the NEJAC Public Dialogues on Urban Revitalization and Brownfields*. <http://www.epa.gov/swerosps/ej/html-doc>. Accessed June 7, 2002.

US Environmental Protection Agency. 2002. *Brownfields Glossary of Terms*. <http://www.epa.gov/swerosps/bf/glossary.htm#brow>. Accessed October 29, 2002.

Verbit, S. R. 2001. New Law May Unlock Potential for Brownfields. *Environmental Protection* 12(8):31–33.

World Commission for Environment and Development. 1987. *Our Common Future* (The Brundtland Report). United Nations, Greven.

Submitted March 11, 2002; revised November 1, 2002; accepted November 5, 2002.