Sustainable America

A New Consensus for the Prosperity, Opportunity and a Healthy Environment for the Future, February 1996

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Preface

FOR NEARLY THREE years, we have jointly chaired a remarkable group of individuals - leaders from government, business, environmental, civil rights, labor, and Native American organizations - in an effort to overcome long years of conflict and agree on ways to achieve national environmental, economic, and social goals. President Clinton asked us to advise him on sustainable development, the idea that the quality of the country's future rests on integrating the economy, equity, and environment in national policy. This report is the expression of an agreement that has surprised us by its unanimity and its emphasis on values, consensus, and community. It is a beginning, the start of a national journey toward sustainability, but not a detailed roadmap.

Early in our work we were challenged by Vice President Gore to "look long, be creative, and think big." The mandate to be visionary was indispensable to our work. Long before we debated policies and action we agreed upon a vision, unifying beliefs, and a set of long-term national goals. It is important to decide where you are going before you argue about how to get there. Finding common values and shared goals is a better way to shape the future than endless reruns of the stale drama of confrontation.

We recognized that both communities and nations exist to secure for their individual citizens the benefits of collective action in response to common problems. This collective action must, at least in a democracy, be based upon agreements of common purpose. It has been our personal experience that American society has been having increasing difficulty reaching agreement about societal goals. This has been especially true for those issues that lie within the overlapping shadows of Americans' hopes for economic progress, environmental protection, and social equity. Policy debates in these areas have been characterized by confrontation and mistrust.

Most of the members brought experience with the contentiousness of these issues to the Council, and--even as environmental debates in the nation suddenly veered toward greater polarization--we spent many hours in many meetings searching for a path toward agreement. We did not resolve all of our differences, but we did find a common ground of values such that each member has chosen to sign this report. The two of us, and we think many of our colleagues on the Council, have come to believe that the current polarization is just the reason why our agreement is important. We were able to find common ground on goals and values, and sometimes, although not always, on ways to achieve our goals and practice our values. Above all, we agreed strongly about the value of the process we went through to search for and build consensus.

The politics of mistrust are the greatest obstacle to the process of innovation and change that we all believe is necessary to achieve the goals we share. We believe that consensus will move America forward both faster and farther than confrontation. Moreover, we believe that consensus is the public's job, not the governments. Government is important in implementing what people agree on, but we all need to do the hard work of listening, learning, and finding common ground.

Neither the Council nor the President alone can bring about change in the United States. Change will not and cannot come alone from Washington to the country, although Washington must provide leadership. The work of the Council will be important only if it ignites many debates; helps to inspire independent action; and encourages business, citizens, and government to invent new forms of dialogue and interaction.

The President's idea of appointing "industry" and "environmental" co-chairs for a Council that included members of his cabinet as well as leaders from many sectors of society presented us with an unusual challenge. We hardly knew each other when we started. The "environmentalist" had experience as a regulatory official, environmental litigator, and sharp critic of the company in which the "industrialist" has spent his professional life. Now we had to agree--and learn to trust each other--to be able to lead the Council.

Over the past three years we have given dozens of speeches together, held joint press conferences, met with hundreds of citizens - some of whom had harsh words and deep suspicion of one or the other of us because of our background. We have chaired scores of meetings and spent countless hours debating how to help the Council succeed. Through all this, we have developed a warm friendship and a capacity to find a genuine and productive congruence of views on most any issue. We have sometimes lost track of which of us was the executive and which the environmentalist, and, indeed, after one speech to a Rotary Club even our audience was confused.

The meetings of the Council have been public, and we have invited hundreds of people from dozens of communities to address us. Often, community leaders and local activists moved the Council ahead by voicing a cogent mix of vision and pragmatism, concem fol the future, and conviction that people can find sensible solutions. We thank them. They helped us greatly. We hope our report helps them.

Finally, we want to offer our thanks and earnest appreciation to the Council's executive director, Molly Harriss Olson, and her bright, dedicated staff, and to express our great gratitude and admiration for the members of the Council. We have watched with deepening respect as the members set aside their preconceptions and approached hard issues with openness and honesty. We have been touched by their eloquence and conviction. We have enjoyed their humor and valued their forbearance. They confronted the question, "What are our hopes and how do we meet our responsibility to the future?" with courage, intelligence, and integrity. We thank them for having made it such a privilege to work with them.

Jonathan Lash
President
World Resources Institute

David T. Buzzelli
Vice President
The Dow Chemical Company

Definition and Vision Statement

Definition of Sustainable Development

"... to meet the needs of the present without compromising the ability of future generations to meet their own needs."

-- The World Commission on Environment and Development
(The Brundtland Commission), Our Common Future)
(Oxford: Oxford University Press, 1987), p. 43

Vision Statement

Our vision is of a life-sustaining Earth. We are committed to the achievement of a dignifled, peaceful, and equitable existence. A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends.

-- The President's Council on Sustainable Development

We Believe Statement

There are certain beliefs that we as Council members share that underlie all of our agreements. We believe:

1. To achieve our vision of sustainable development, some things must grow--jobs, productivity, wages, capital and savings, profits, information, knowledge, and education--and others--pollution, waste, and poverty--must not.

2. Change is inevitable and necessary for the sake of future generations and for ourselves. We can choose a course for change that will lead to the mutually reinforcing goals of economic growth, environmental protection, and social equity.

3. Steady progress in reducing disparities in education, opportunity, and environmental risk within society is essential to economic growth, environmental health, and social justice.

4. The United States made great progress in protecting the environment in the last 25 years, and must continue to make progress in the next 25 years. We can achieve that goal because market incentives and the power of consumers can lead to significant improvements in environmental performance at less cost.

5. Economic growth based on technological innovation, improved efficiency, and expanding global markets is essential for progress toward greater prosperity, equity, and environmental quality.

6. Environmental regulations have improved and must continue to improve the lives of all Americans. Basic standards of performance that are clear, fair, and consistently enforced remain necessary to protect that progress. The current regulatory system should be improved to deliver required results at lower costs. In addition, the system should provide enhanced flexibility in return for superior environmental performance.

7. Environmental progress will depend on individual, institutional, and corporate responsibility, commitment, and stewardship.

8. We need a new collaborative decision process that leads to better decisions; more rapid change; and more sensible use of human, natural, and financial resources in achieving our goals.

9. The nation must strengthen its communities and enhance their role in decisions about environment, equity, natural resources, and economic progress so that the individuals and institutions most immediately affected can join with others in the decision process.

10. Economic growth, environmental protection, and social equity are linked. We need to develop integrated policies to achieve these national goals.

11. The United States should have policies and programs that contribute to stabilizing global human population; this objective is critical if we hope to have the resources needed to ensure a high quality of life for future generations.

12. Even in the face of scientific uncertainty, society should take reasonable actions to avert risks where the potential harm to human health or the environment is thought to be serious or irreparable.

13. Steady advances in science and technology are essential to help improve economic efficiency, protect and restore natural systems, and modify consumption patterns.

14. A growing economy and healthy environment are essential to national and global security.

15. A knowledgeable public, the free flow of information, and opportunities for review and redress are critically important to open, equitable, and effective decisionmaking.

16. Citizens must have access to high-quality and lifelong formal and nonformal education that enables them to understand the interdependence of economic prosperity, environmental quality, and social equity--and prepares them to take actions that support all three.

Introduction

President Clinton asked the Council to recommend a national action strategy for sustainable development at a time when Americans are confronted with new challenges that have global ramifications. The Council concluded that in order to meet the needs of the present while ensuring that future generations have the same opportunities, the United States must change by moving from conflict to collaboration and adopting stewardship and individual responsibility as tenets by which to live.

IN JUNE 1993, when President Clinton created the President's Council on Sustainable Development, he asked us to find ways "to bring people together to meet the needs of the present without jeopardizing the future."[1] He gave us a task that required us to think about the future and about the consequences of the choices this generation makes on the lives of future generations. It is a task that has caused each of us to think about human needs, economic prosperity, and human interactions with nature differently than we had before.

No one can predict the future--how people will live, or what exactly they will need--but it is possible to foresee the likely effects of some of today's decisions and to make choices that honor the interests of present and future generations. In the nearly three years of the Council's work, in our meetings across the country, we heard concern that despite America's great wealth, power, and technological prowess, Americans cannot assume that the future of their children's lives will be better than the present. Those who met with us see, as we do, trends that lead in troubling directions and opportunities that must soon be seized or lost.

The recommendations in this report are not only for government, but also for the private sector and citizens since government by itself cannot overcome apathy, spur innovation, or inspire new values.

We view this challenge with considerable optimism because the potential benefits of knowledge are essentially inexhaustible; because global attention to developing sustainably is growing; and because many communities, companies, and individuals are independently taking first steps toward responding to the need for change.

But optimism is not complacency. Opportunities for change and anecdotes of progress do not by themselves redirect global trends. There are substantial obstacles to overcome that require conscious and concerted action, sometimes by government, sometimes by the private sector, or sometimes by citizens in communities or as individuals--but often, all sectors need to be actively

involved. The recommendations in this report are not only for government, but also for the private sector and citizens since government by itself cannot overcome apathy, spur innovation, or inspire new values.

New Challenges for Americans

These are remarkable times. This is an era of rapid and often bewildering alterations in the forces and conditions that shape human life. This is evident both in the altered nature of geopolitics in the post-Cold War era and in the growing understanding of the relationship between human beings and the natural world.

The end of the Cold War has been accompanied by the swift advance of democracy in places where it was previously unknown and an even more rapid spread of market-based economies. The authority of central governments is eroding, and power has begun to shift to local governments and private institutions. In some countries, freedom and opportunity are flourishing, while in others these changes have unleashed the violence of old conflicts and new ambitions.

Internationally, trade, investment, information, and even people flow across borders largely outside of governmental control. Domestically, deregulation and the shift of responsibilities from federal to state and local governments are changing the relationships among levels of government and between government and the private sector.

Communications technology has enhanced people's ability to receive information and influence events that affect them. This has sparked explosive growth in the number of organizations, associations, and networks formed by citizens, businesses, and communities seeking a greater voice for their interests. As a result, society outside of government--civil society--is demanding a greater role in governmental decisions, while at the same time impatiently seeking solutions outside government's power to decide.

But technological innovation is changing much more than communication. It is changing the ways in which Americans live, work, produce, and consume. Knowledge has become the economy's most important and dynamic resource. It has rapidly improved efficiency as those who create and sell goods and services substitute information and innovation for raw materials. During the past 20 years, the amount of energy and natural resources the U.S. economy uses to produce each constant dollar of output has steadily declined, as have many forms of pollution.[2] When U.S. laws first required industry to control pollution, the response was to install cleanup equipment. The shift to a knowledge-driven economy has emphasized the positive connection among efficiency, profits, and environmental protection and helped launch a trend in profitable pollution prevention. More Americans now know that pollution is waste, waste is inefficient, and inefficiency is expensive.

Even as their access to information and to means of communication have increased, citizens of wealthy industrialized nations are becoming cynical about, and frustrated with, traditional political arrangements that no longer seem responsive to their needs. The confidence of many Americans in the large institutions that affect their lives--such as business; government; the media; and environmental, labor, and civic organizations--is eroding. Individual citizens have lost faith in their ability to influence events and have surrendered to apathy, or, worse, to anger.

We saw striking contrasts between communities struggling with disaffection and despair, and communities where energized and optimistic citizens have become engaged in shaping their own future.

Bringing about positive change is the challenge that the United States, and we as a Council, face. We believe that significant change is both necessary and inevitable. American society has been characterized by its capacity to embrace and profit from change. But how can communities be mobilized to leave future generations a cleaner, more resilient environment; a more prosperous nation; a more equitable society; and a more productive and efficient economy--one that is competitive internationally? The situation is especially difficult because the pace and extent of today's changes are unprecedented, reflecting the local consequences of the interaction of economic, social, and environmental forces at the global level.

Global Changes That Affect Us All

Since the end of World War II, the world's economic output has increased substantially, allowing widespread improvements in health, education, and opportunity, but also creating growing disparities between rich and poor. Even within wealthy nations, including the United States, the gap between rich and poor is widening.[3]

Tomorrow's world will be shaped by the aspirations of a much larger global population. The number of people living on Earth has doubled in the last 50 years; the equivalent of the population of the United States was added to the world total during the course of this Council's work.[4]

Prosperity, fairness, and a healthy environment are interrelated elements of the human dream of a better future. Sustainable development is a way to pursue that dream through choice and policy

Growing populations demand more food, goods, services, and space. Where there is scarcity, population increase aggravates it. Where there is conflict, rising demand for land and natural resources exacerbates it. Struggling to survive in places that can no longer sustain them, growing populations overfish, overharvest, and overgraze.

Economic growth and innovations in agricultural technology allow many of the world's people to improve their lives as global population increases, but growth and improvement are not without consequences to the Earth's natural systems. Some of the resources used, such as minerals and fossil fuels, while plentiful, are finite; once used, they are exhausted and cannot be renewed. Living resources--plants, animals, and fish--are renewable, but can be destroyed. Human ingenuity has developed alternatives for scarce resources, but that does not mean that depletion of resources has been--or will be--free of serious human and natural consequences. In fact, the demands of a growing human population and an expanding global economy are placing increasing stresses on natural systems.

And while the exhaustion of finite resources may result in human and economic dislocation, the destruction of renewable resources often has far broader ramifications because they are part of a

dynamic and interdependent natural system. When a forest is destroyed, species lose their habitat and disappear. The resulting erosion affects river and coastal resources, and, in many cases, rainfall patterns change.

In the late 20th century, the effects of human activity on natural systems are not only visible, they are observable from year to year. In the 130 years from 1850 to 1980, about 15 percent of the world's forests disappeared. During the next 10 years, another 6 percent--an area larger than California, Texas, New York, and Montana combined--was cut and not replanted.[5] The expansion of human population and the destruction of forests, grasslands, wetlands, and river systems bring an accelerated loss of species diversity. This diversity is the source not only of a wide range of human benefits--25 percent of new medicines, for example--but also the key to the ecosystem's resilience in the face of change.[6] The pressures on natural resources are myriad. For example, pollution, coastal development, and intense fishing reduce ocean fish stocks. While the number and size of fishing fleets are increasing worldwide, fish harvests are falling.[7] Human activity, primarily the burning of coal, oil, and gas, releases pollutants that are changing the chemistry of the Earth's atmosphere--changes that may eventually affect the Earth's climate.

Economic growth has often been accompanied by pollution, affecting both human health and the environment. Even though many wealthy nations have made remarkable progress in reducing pollution, the focus of industrial expansion has shifted to developing nations where environmental protection sometimes may not be regarded as affordable. Even though pollution controls and efficiency in developed nations have started to offset some of the global effects of growth, global pollution is increasing.

Because global economic, social, and environmental trends are connected, Americans' hopes for the future are linked to the rest of the world. Americans compete in a global economy shaped by global trends. American power and interests are global in nature, and the lives of Americans are affected by global environmental changes. The United States, with its high standard of living, is the largest producer and consumer of goods and services, and the largest producer of wastes on Earth.[8] What Americans do affects the lives of people in every nation, and changes in their lives eventually affect Americans.

The U.S. economy, although still the world's largest, is no longer dominant; it is part of a global marketplace. U.S. enterprises can no longer thrive by looking only to domestic markets and domestic competitors. The fastest growing markets are not in the industrialized countries, but in those countries whose economies are in the process of becoming industrialized. Banks and private investors create huge international capital flows, seeking opportunities wherever they occur. Exports represent 7.3 percent of the U.S. gross domestic product. Imports are 9.5 percent of U.S. consumption. Burgeoning international trade now exceeds $4 trillion per year. International currency trading exceeds $1 trillion per day.[9]

The paradoxical challenge that the United States and the world face at the end of the 20th century is to generate individual economic opportunities and national wealth necessary for economically healthy societies while, at the same time, lessening the environmental risks and social inequities that have accompanied past economic development. Both in the world and in the United States, there will be more people and they will aspire to better lives. Responding to those aspirations, particularly if prevalent patterns of consumption continue, will require the

production of more goods and services. The challenge of sustainable development is to find ways to meet those needs without destroying the resources upon which future progress depends.

Pursuit of Common Goals

Prosperity, fairness, and a healthy environment are interrelated elements of the human dream of a better future. Sustainable development is a way to pursue that dream through choice and policy. Work, wealth, community, and the environment are interwoven into the fabric of everyday life and the life of the nation. Sustainable development is the framework that integrates economic, environmental, and social goals in discourse and policies that enhance the prospects of human aspirations.

The Council had hard and frequent debates about the term economic growth, and heard it discussed by members of the public as well, at almost all of our meetings. In the end, we found agreement around the idea that to achieve our vision of sustainability some things must grow--jobs, productivity, wages, profits, capital and savings, information, knowledge, education--and others--pollution, waste, poverty, energy and material use per unit of output--must not. We agree on growth, and agree that it must be defined and measured with care. The issue is not whether the economy needs to grow but how and in what way.

An economy that creates good jobs and safeguards public health and the environment will be stronger and more resilient than one that does not. A country that protects its ecosystems and manages its natural resources wisely lays a far stronger base for future prosperity than one that carelessly uses its assets and destroys its natural capital. A society that invests in its children and communities, equitably providing education and opportunity, is far more likely to prosper than one that does not make such investments and allows the gap between rich and poor to widen.

By recognizing that economic, environmental, and social goals are integrally linked and by having policies that reflect that interrelationship, Americans can regain their sense that they are in control of their future and that the lives of each generation will be better than the last. Thinking narrowly about jobs, energy, transportation, housing, or ecosystems--as if they were not connected--creates new problems even as it attempts to solve old ones. Asking the wrong questions is a sure way to get misleading answers that result in short-term remedies for symptoms, instead of cures for long-term basic problems.

Seeing choices in terms of tradeoffs and balance reflects a history of confrontational politics. It pits vital necessities against each other in a false contest that inhibits exploration of the best solutions, those that link economic gain, ecological improvement, social equity, and well-being--solutions that build common purpose from shared goals.

The United States is a democracy with powerful traditions of individual liberty. What happens in American society ultimately depends on the values that guide the choices that individuals make--which is a function of their commitment and understanding. People act according to their perception of the intersection of their needs and wants, their values and conditions, and the events that affect them. But the narrow and immediate interests of individuals, organizations, or

government officials do not necessarily coincide with the long-term interests of a larger community at home or abroad. Although people can act in the interests of the larger community, they rarely do so alone. Because each fears losing separately, all lose together.

Moving Forward:
From Conflict to Collaboration

How can more than 261 million individual Americans define and reconcile their needs and aspirations with community values and the needs of the future? Our most important finding is the potential power of and growing desire for decision processes that promote direct and meaningful interaction involving people in decisions that affect them. Americans want to take back control of their lives. Communities throughout the country are demonstrating that it is possible to shift from conflict to collaboration when citizens find common values to guide community action. Trust can be restored, hope can be expanded, and people can find ways to lead prosperous lives in harmony with the environment. Throughout this report, there are recommendations to create structures that will involve more people and a broader range of interests in shaping community vision and making public policy. These will improve decisions, mitigate conflict, and begin to counteract the corrosive trends of cynicism and civic disengagement that afflict society.

More collaborative approaches to making decisions can be arduous and time-consuming (as we have learned over the past nearly three years), and all of the players must change their customary roles. For government, this means using its power to convene and facilitate, shifting gradually from prescribing behavior to supporting responsibility by setting goals, creating incentives, monitoring performance, and providing information.

The federal government, in particular, can help set boundaries for and facilitate place-based policy dialogues. These are dialogues that focus on the resources and management of conflicts of particular places or regions while giving more opportunity, power, and responsibility to communities to address natural resource questions that affect them directly and primarily.

For their part, businesses need to build the practice and skills of dialogue with communities and citizens, participating in community decisionmaking and opening their own values, strategies, and performance to their community and the society.

Advocates, too, must accept the burdens and constraints of rational dialogue built on trust, and communities must create open and inclusive debates about their future.

Stewardship As A Guide

Stewardship is an invaluable guide to action. Members of the Council were powerfully moved by testimony from a group of senior clergy and lay leaders representing a remarkably broad spectrum of religious groups. They said that the call to care for the Earth is an inescapable component and a rigorous standard of faith. It is a human impulse as well as a moral imperative. In so many modes--intuitive, aesthetic, spiritual, religious--humans know that by protecting the Earth, they find a sense of place and purpose and fulfill a moral obligation to the future.

The intuitive and essentially moral commitment Americans have to preserving Earth's beauty and productivity for future generations is best expressed in the concept of stewardship. Principles of stewardship help define appropriate human interaction with the natural world. Stewardship is more a perspective than a science; it is a set of values that applies to a variety of decisions. It provides moral standards that cannot be imposed but can be taught, encouraged, and reinforced. Instilled in individuals and institutions, it can motivate resolve for voluntary change. Principles of stewardship can illuminate complex policy choices and guide individuals toward the common good.

Stewardship is a workable perspective for all professions. For government, it can refocus policy on the long-term needs of the economy. For advocates, it can mean embracing the needs for prosperity, environmental protection, and social equity and well-being. For corporate America, it can profitably shape a business' strategic vision and inform decisions on the shop floor. For families, it can provide a framework for rethinking customs of consumption. This report suggests a variety of means to inform, encourage, reward, and support stewardship.

Individual Responsibility

Another important emphasis of the report is on individual responsibility. No set of policies, no system of incentives, no amount of information can substitute for individual responsibility or counteract apathy. Information can provide a basis for action. Vision and ideas can influence perceptions and inspire change. New ways to make decisions can empower those who seek a role in shaping the future. However, our recommendations will be meaningless unless individuals acting as citizens, consumers, investors, managers, workers, and professionals decide that it is important to them to make choices on the basis of a broader, longer view of their self-interest; to get involved in turning those choices into action; and, most importantly, to be held accountable for their actions.

The combination of political will, technological innovation, and a very large investment of resources and human ingenuity in pursuit of environmental goals has produced enormous benefits for Americans. This is an achievement to celebrate, but in a world and a nation that steadily uses more materials to make more goods for more people, we recognize that we will have to achieve more in the future for the sake of the future. We foresee a world in which zero waste will become an ideal for society even as zero defects has become so for manufacturing.

We are convinced that the change in the form and nature of the civic discussion that we propose can make the issues of sustainability a bridge between people and institutions. That, we believe, is the essence of sustainable development: the recognition that the pursuit of one set of goals affects others and that we must pursue policies that integrate economic, environmental, and social goals.

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[1] Executive Order No. 12852, 29 June 1993, amended 19 July 1993, 42 U.S.C. 4321.

[2] Since 1973, the amount of energy needed to produce each constant dollar of gross domestic product has declined nearly 30 percent. See U.S. Department of Energy, Energy Information Administration, Monthly Energy Review: October 1995, DOE/EIA-0035(95/10) (Washington, D.C., October 1995), p. 16, fig. 1.8 and table 1.9.

[3] Global gross domestic product has doubled since 1980. See World Bank, *World Tables 1995* (Baltimore, Md: The Johns Hopkins University Press, 1995), pp. 28-29, table 7; and U.S. Department of Commerce, *Statistical Abstract of the United States 1994* (Washington, D.C.: Government Printing Office, 1994), p. 470, table 716.

[4] U.S. Department of Commerce, Bureau of the Census, *World Population Profile: 1994* (Washington, D.C.: Government Printing Office, 1994), p. A-1, table 1; and World Resources Institute, *World Resources 1994-95*, prepared in collaboration with the U.N. Environment Program and the U.N. Development Program (New York: Oxford University Press, 1994), p. 268, table 16.1.

[5] World Conservation Monitoring Center, *Global Biodiversity: Status of the Earth's Living Resources* (New York: Chapman & Hall, 1992), p. 253, table 18.3; *World Resources 1994-95*, p. 305; and World Resources Institute, *Global Biodiversity Strategy: Guidelines for Action to Save, Study, and Use Earth's Biotic Wealth Sustainably and Equitably*, prepared in collaboration with the U.N. Environment Program and The World Conservation Union (Washington, D.C.: World Resources Institute, 1992), p. 7.

[6] Walter V. Reid et al., *Biodiversity Prospecting: Using Genetic Resources for Sustainable Development* (Washington, D.C.: World Resources Institute, 1993), p. 7.

[7] Eduardo A. Loayza, *A Strategy for Fisheries Development* (Washington, D.C.: World Bank, 1992), p. xi; U.N. Food and Agriculture Organization (FAO), *Bulletin of Fishery Statistics: Fishery Fleet Statistics* (Rome, 1988); *and FAO Yearbook Fisheries Statistics 1993*, vol. 76 (Rome, 1993), p. xi, "World Catch."

[8] The United States has the largest gross domestic product (GDP) in the world. See *Statistical Abstract of the United States 1994*, p. 446, table 684 (for U.S. GDP); and p. 862, table 1366 (for GDP comparisons). Estimates of the U.S. share of world resource consumption range from 20 to 30 percent. In 1993, the United States consumed approximately 24 percent of world energy. See U.S. Department of Energy, Energy Information Administration, *International Energy Annual: 1993*, DOE/EIA-0219(93) (Washington, D.C.: Government Printing Office, 1995), p. vii. U.S. consumption of raw materials in 1993 equaled nearly 30 percent of the world total. See U.S. Department of the Interior, Bureau of Mines, "Changing Minerals and Material Use Patterns" (presented at the Annual General Meeting of the Academia Europaea, Parma, Italy, 23-25 June 1994), figs. 5-1 and 5-2. The United States is the largest producer of waste per capita among Organization for Economic Cooperation and Development (OECD) countries. See OECD, *OECD Environmental Performance Reviews -- Netherlands* (Paris, 1995), p. 78, fig. 4.2.

[9] Based upon 1993 merchandise exports of $464.7 billion, merchandise imports of $603.4 billion and a gross domestic product (GDP) of $6.4 trillion. See *World Tables 1995*, pp. 76-77, table 19 (for 1993 import/export data); and *Statistical Abstract of the United States 1994*, p. 446, table 684 (for GDP). International trade data are from the U.N. Conference on Trade and Development, *Handbook of International Trade and Development Statistics 1989* (New York: United Nations, 1990), pp. 2-3, tables 1.1 and 1.2. International currency trading data are from Anthony Ramirez, "Automation Drives Surge in Currency Trading Volume," *New York Times*, 20 September 1995, sec. D, p. 3.

Chapter 1

National Goals Toward Sustainable Development

This common set of goals emerged from the Council's vision. These goals express in concrete terms the elements of sustainability. Alongside the goals are suggested indicators that can be used to help measure progress toward achieving them.

THE FOLLOWING GOALS express the shared aspirations of the President's Council on Sustainable Development. They are truly interdependent and flow from the Council's understanding that it is essential to seek economic prosperity, environmental protection, and social equity together. The achievement of any one goal is not enough to ensure that future generations will have at least the same opportunities to live and prosper that this generation enjoys: all are needed.

GOAL 1: HEALTH AND THE ENVIRONMENT

Ensure that every person enjoys the benefits of clean air, clean water, and a healthy environment at home, at work, and at play.

GOAL 2: ECONOMIC PROSPERITY

Sustain a healthy U.S. economy that grows sufficiently to create meaningful jobs, reduce poverty, and provide the opportunity for a high quality of life for all in an increasingly competitive world.

GOAL 3: EQUITY

Ensure that all Americans are afforded justice and have the opportunity to achieve economic, environmental, and social well-being.

GOAL 4: CONSERVATION OF NATURE

Use, conserve, protect, and restore natural resources - land, air, water, and biodiversity - in ways that help ensure long-term social, economic, and environmental benefits for ourselves and future generations.

GOAL 5: STEWARDSHIP

Create a widely held ethic of stewardship that strongly encourages individuals, institutions, and corporations to take full responsibility for the economic, environmental, and social consequences of their actions.

GOAL 6: SUSTAINABLE COMMUNITIES

Encourage people to work together to create healthy communities where natural and historic resources are preserved, jobs are available, sprawl is contained, neighborhoods are secure, education is lifelong, transportation and health care are accessible, and all citizens have opportunities to improve the quality of their lives.

GOAL 7: CIVIC ENGAGEMENT

Create full opportunity for citizens, businesses, and communities to participate in and influence the natural resource, environmental, and economic decisions that affect them.

GOAL 8: POPULATION

Move toward stabilization of U.S. population.

GOAL 9: INTERNATIONAL RESPONSIBILITY

Take a leadership role in the development and implementation of global sustainable development policies, standards of conduct, and trade and foreign policies that further the achievement of sustainability.

GOAL 10: EDUCATION

Ensure that all Americans have equal access to education and lifelong learning opportunities that will prepare them for meaningful work, a high quality of life, and an understanding of the concepts involved in sustainable development.

Accompanying the goals are indicators of progress, yardsticks to measure progress toward each goal. These indicators of progress suggest what information to look at to determine the progress that the country is making toward achieving the goals. They are not intended to be mandates for specific actions or policies, and they may change over time as the country moves toward these goals and learns more about the science and policy options underlying them. Graphics illustrating a few possible indicators are included. In some cases, the suggested indicators are concepts that are not now easily measured and will require more work before they can be used as true yardsticks.

GOAL 1

HEALTH AND THE ENVIRONMENT

Ensure that every person enjoys the benefits of clean air, clean water, and a healthy environment at home, at work, and at play.

FIGURE 1

SOURCE: The National Public Water System Supervision Program, *FY 7994 National Compliance Report.*

INDICATORS OF PROGRESS

Clean air, clean water, and reduced exposure to toxics are basic indicators. Beyond that, other environmental exposures (such as to lead and tobacco smoke) can also contribute directly and indirectly to health problems. Where causal links can be identified, additional indicators should be used.

CLEAN AIR
Decreased number of people living in areas that fail to meet air quality standards.

DRINKING WATER
Decreased number of people whose drinking water fails to meet national safe drinking water standards.

TOXIC EXPOSURES
Reduced releases that contribute to human exposure to toxic materials.

DISEASES AND MORTALITY
Decrease in diseases and deaths from environmental exposures, including occupationally related illnesses.

ECONOMIC PROSPERITY

Sustain a healthy U.S. economy that grows sufficiently to create meaningful jobs, reduce poverty, and provide the opportunity for a high quality or life for all in an increasingly competitive world.

FIGURE 2

SOURCE: U.S. Department of Commerce, *Statistical Abstract of the United States 1994* (Washington, D.C.: Government Printing Office, 1994).

The traditional measures of economic activity include gross domestic product (GDP), net domestic product (NDP), and the unemployment rate. These measures, however, do not take into account negative environmental impacts of production and consumption or gauge the incidence of poverty. The Council agreed that additional yardsticks are needed for adequately gauging economic progress in the broadest sense.

ECONOMIC PERFORMANCE
Increases in per capita GDP and NDP.

EMPLOYMENT
Increases in the number, wage level, and quality of jobs (as measured, for example, by the percentage of jobs at or below minimum wage).

POVERTY
Decreased number of people living below the poverty line.

SAVINGS AND INVESTMENT RATES
Higher per capita savings and investment rates.

NATURAL RESOURCES AND ENVIRONMENTAL ACCOUNTING
Development and use of new economic measures or satellite accounts that reflect resource depletion and environmental costs.

PRODUCTIVITY
Increased per capita production per hour worked.

GOAL 3

EQUITY

Ensure that all Americans are afforded justice and have the opportunity to achieve economic, environmental, and social well-being.

FIGURE 3

SOURCE: World Resources Institute, Resources and Environmental Information Program, Washington, D.C., 1995.

INDICATORS OF PROGRESS

The Council believes that equity is such an important goal that it has worked to weave this priority into each element of this report. However, measuring fairness and equality of opportunity throughout a population is complex. It requires measuring differences between rich and poor in a number of ways and involves yardsticks not yet available. Such measures should be developed to show whether the nation is progressing toward greater equity by reducing disparities in risks and access to benefits.

INCOME TRENDS

Increase in the average income of the bottom 20 percent compared with that of the top 20 percent of the U.S. population.

ENVIRONMENTAL EQUITY

Development of measures of any disproportionate environmental burdens (such as exposure to air, water, and toxic pollution) borne by different economic and social groups.

SOCIAL EQUITY

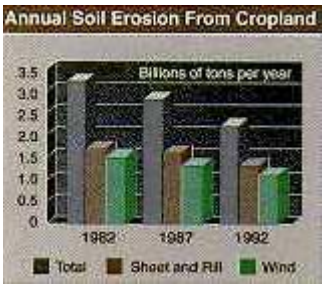
Development of measures of access to critical services (such as education, health care, and community services), and opportunities to participate in decisionmaking by different economic and social groups, such as the percentage of these populations attending college.

GOAL 4

CONSERVATION OF NATURE

Use, conserve, protect, and restore natural resources - land, air, water, and biodiversity - in ways that help ensure long-term social, economic, and environmental benefits for ourselves and future generations.

FIGURE 4



SOURCE: U.S. Department of Agriculture, Natural Resources Conservation Service, *Summary Report, 1992 -- National Resources Inventory* (Washington, D.C., 1995).

INDICATORS OF PROGRESS

Measuring the health and extent of natural systems is difficult because they are complex; vary over time and space; and have effects that can be local, regional, and/or global. Most of the following indicators focus on local and regional systems, reflecting the Council's work on watersheds and communities. Additional indicators are needed to reflect how well the nation is contributing to the protection of natural systems worldwide.

ECOSYSTEMS

Increase in the health of ecosystems, including forests, grasslands, wetlands, surface waters, and coastal lands:

- Decreased soil loss and associated productivity loss due to erosion and chemical or biological changes in natural systems and other lands such as agricultural lands.
- Increased number of acres of healthy wetlands.
- Increased percentage of forests managed to reach full maturity and diversity.
- Development of indicators to measure water bodies with healthy biological communities.

HABITAT LOSS

Development of measures of threats to habitat loss and the extent of habitat conversion, such as the rate of wetlands loss.

THREATENED AND ENDANGERED SPECIES

Decreased number of threatened and endangered species.

NUTRIENTS AND TOXICS

Decreased releases that contribute to the exposure of natural systems to toxics and excess nutrients.

EXOTIC SPECIES

Reduced ecological impacts caused by the introduction and spread of exotic species.

GLOBAL ENVIRONMENTAL CHANGE

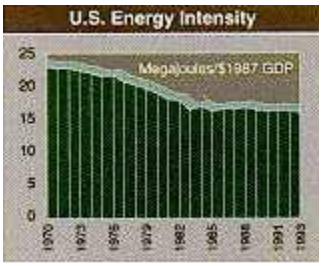
Reduced emissions of greenhouse gases and of compounds that damage the ozone layer.

GOAL 5

STEWARDSHIP

Create a widely held ethic of stewardship that strongly encourages individuals, institutions, and corporations to take full responsibility for the economic, environmental, and social consequences of their actions.

FIGURE 5



SOURCE: World Resources Institute, Resources and Environmental Information Program, Washington, D.C., 1995.

INDICATORS OF PROGRESS

Stewardship is an ethic or value; quantitative measures of it are difficult and need further work. What can be readily measured is the use of natural resources within the United States - efficient use and wise management are key to ensuring that such resources will be available for future generations.

MATERIALS CONSUMPTION
Increased efficiency of materials use, such as materials intensity measured per capita or per unit of output.

WASTE REDUCTION
Increased source reduction, reuse, recovery, and recycling,

ENERGY EFFICIENCY
Reduced energy intensity (energy per unit output).

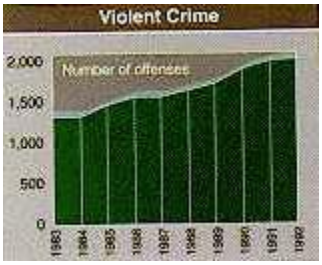
RENEWABLE RESOURCE USE
Decreased rate of harvest or use compared to rate of regeneration in fisheries, forests, soil, and groundwater.

GOAL 6

SUSTAINABLE COMMUNITIES

Encourage people to work together to create healthy communities where natural and historic resources are preserved, jobs are available, sprawl is contained, neighborhoods are secure, education is lifelong, transportation and health care are accessible, and all citizens have opportunities to improve the quality of their lives.

FIGURE 6



SOURCE: Statistical Abstract of the United States 1994.

INDICATORS OF PROGRESS

Local values and priorities shape the characteristics that contribute to strong and stable communities. However, thriving communities across the nation share many common traits as do threatened communities. Indicators need to allow for diversity among communities while recognizing national priorities.

COMMUNITY ECONOMIC VIABILITY
Increased local per capita income and employment in urban, suburban, and rural communities.

SAFE NEIGHBORHOODS
Decrease in violent crime rates.

PUBLIC PARKS
Increase in urban green space, park space, and recreational areas.

INVESTMENT IN FUTURE GENERATIONS
Increase in the amount of public and private resources dedicated to children, including health care, maternal care, childhood development, and education and training.

TRANSPORTATION PATTERNS
Decrease in measures of traffic congestion; increase in the use of public and alternative transportation systems.

COMMUNITY ACCESS TO INFORMATION
Increase in library use and the percentage of schools and libraries with access to the Internet and National Information Infrastructure.

SHELTER
Decreased number of homeless people by community.

METROPOLITAN INCOME PATTERNS
Reduced disparity in per capita income between urban areas and their suburbs.

INFANT MORTALITY
Decrease in infant mortality rates by economic and social group.

GOAL 7

CIVIC ENGAGEMENT

Create full opportunity for citizens, businesses, and communities to participate in and influence the natural resource, environmental, and economic decisions that affect them.

FIGURE 7

SOURCE: Statistical Abstract of the United States 1994.

INDICATORS OF PROGRESS

Democratic societies rely on an engaged population of diverse individuals and institutions. Additional measures are needed to track participation and gauge the effectiveness of policies that strengthen cooperative decisionmaking while still allowing for individual leadership and creativity. Effective yardsticks may come from studying successful efforts to build community values, public trust, and government responsiveness.

PUBLIC PARTICIPATION

Increase in the percentage of eligible voters who cast ballots in national, state, and local elections.

New indicators must be developed to measure:

SOCIAL CAPITAL

Increase in citizen engagement and public trust, such as the willingness of people in a community to cooperate for their mutual benefit.

CITIZEN PARTICIPATION

Increase in community participation in such civic activities as professional and service organizations, parent-teacher associations, sporting leagues, and volunteer work.

COLLABORATIONS

Increased use of successful civic collaborations such as public-private partnerships, community-based planning and goal-setting projects, and consensus-building efforts.

GOAL 8

POPULATION

Move toward stabilization of U.S. population.

FIGURE 8

SOURCE: U.S. Department of Commerce, *Statistical Abstract of the United States 1993* (Washington, D.C.: Government Printing Office, 1994).

INDICATORS OF PROGRESS

Together with the more traditional population measurements, such as estimates of growth, trends and measures of the social and economic status of women within society are also important. Evidence has shown that as the health and status of women improve, population pressures become more manageable.

POPULATION GROWTH
Reduced rate of population growth in the United States and the world.

STATUS OF WOMEN
Increased educational opportunity for women; increased income equality for equivalent work.

UNINTENDED PREGNANCIES
Decreased number of unintended pregnancies in the United States.

TEEN PREGNANCIES
Decreased number of teenage pregnancies in the United States.

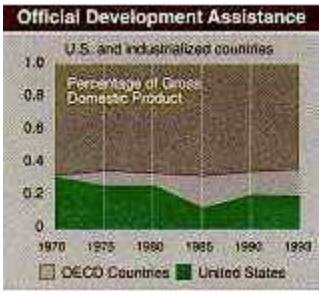
IMMIGRATION
Decreased number of illegal immigrants.

GOAL 9

INTERNATIONAL RESPONSIBILITY

Take a leadership role in the development and implementation of global sustainable development policies, standards of conduct, and trade and foreign policies that further the achievement of sustainability.

FIGURE 9



NOTE: Official development assistance is the net amount of dispersed grants and concessional loans given by member countries of the Organization for Economic Cooperation and Development (OECD).

SOURCE: *Statistical Abstract of the United States 1994*.

INDICATORS OF PROGRESS

The actions taken by the United States have a significant effect on the world's environment, economy, and cultures. This nation has a tradition of global leadership and responsibility. It is important to continue this tradition. While indicators of global leadership apply to all sectors, the following ones focus on the role of the federal government.

INTERNATIONAL ASSISTANCE

Increased level of U.S. international assistance for sustainable development, including official development assistance (federal money dedicated to international aid for developing nations).

ENVIRONMENTAL ASSISTANCE

Increase in the U.S. contribution to the Global Environmental Facility and other environmentally targeted development aid.

ASSESSMENT OF PROGRESS

Development and use of new measures for assessing progress toward sustainable development in countries receiving U.S. assistance.

ENVIRONMENTAL TECHNOLOGY EXPORTS

Increased U.S. exports or transfers of cost-effective and environmentally sound technologies to developing countries.

RESEARCH LEADERSHIP

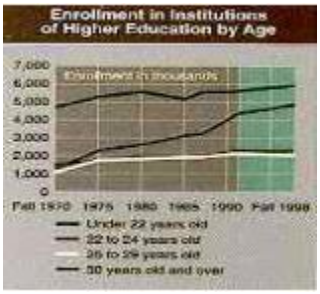
Increased levels of U.S. research on global environmental problems.

GOAL 10

EDUCATION

Ensure that all Americans have equal access to education and lifelong learning opportunities that will prepare them for meaningful work, a high quality of life, and an understanding of the concepts involved in sustainable development.

FIGURE 10



SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, *Digest of Education Statistics 1995* (Washington, D.C.: Government Printing Office, 1993).

INDICATORS OF PROGRESS

Education for sustainable development should be lifelong through integration into formal and nonformal education settings, including teacher education, continuing education, curriculum development, and worker training.

INFORMATION ACCESS
Increased number of communities with infrastructure in place that allows easy access to government information, public and private research, and community right-to-know documents.

CURRICULUM DEVELOPMENT
Increased number of curricula, materials, and training opportunities that teach the principles of sustainable development.

NATIONAL STANDARDS
Increased number of school systems that have adopted K-12 voluntary standards for learning about sustainable development similar to the standards developed under the National Goals 2000 initiative.

COMMUNITY PARTICIPATION
Increased number of school systems and communities with programs for lifelong learning through both formal and nonformal learning institutions.

NATIONAL ACHIEVEMENT
Improved skill performance of U.S. students as measured by standardized achievement tests.

GRADUATION RATES
Increased high school graduation rates and number of students going on to college or vocational training.

Chapter 2

Building a New Framework for a New Century

Future progress requires that the United States broaden its commitment to environmental protection to embrace the essential components of sustainable development: environmental health, economic prosperity, and social equity and well-being. This means reforming the current system of environmental management and building a new and efficient framework based on performance, flexibility linked to accountability, extended product responsibility, tax and subsidy reform, and market incentives.

THE U.S. SYSTEM of environmental management, built largely since 1970, has dramatically improved the country's ability to protect public health and the natural environment. The air and water are cleaner, exposure to toxic wastes is lower, erosion of prime cropland has been reduced, and some wildlife species are back from the brink of extinction. Much still remains to be done, however, to continue these gains and address new environmental threats.

For the last 25 years, government has relied on command-and-control regulation as its primary tool for environmental management. In looking to the future, society needs to adopt a wider range of strategic environmental protection approaches that embrace the essential components of sustainable development: economic prosperity, environmental health, and social equity and well-being. The relationships among these components are clear. Sustained economic growth is dependent on a clean and healthy environment. Further, the ability of the economy to grow, create jobs, and increase overall well-being can suffer if environmental protection strategies deliver low results at a high cost. Resources for other economic and social needs will be diverted if strategies to achieve environmental goals are not designed to achieve results in the most cost-effective way. We, as a Council, have concluded that this will require the nation to develop a new framework for a new century.

There are a number of tools, approaches, and strategies that, if carefully tailored to different challenges, could result in more environmental protection, less economic cost, and--in some cases--greater opportunity for the poor and disadvantaged. It should be clear that market mechanisms are not the right solution for every problem, any more than technology-based standards are the right answer in all cases. The nation should create a new framework for integrating economic and environmental goals that lets all stakeholders take advantage of these opportunities and ensures that tools are applied to the right problem, in the right way, at the right time.

The experience of the last 25 years has yielded the following lessons, which would be wise to heed in developing a new framework to achieve the objectives of sustainable development:

- Economic, environmental, and social problems cannot be addressed in isolation. Economic prosperity, environmental quality, and social equity need to be pursued simultaneously.
- Science-based national standards that protect human health and the environment are the foundation of any effective system of environmental protection.
- The adversarial nature of the current system precludes solutions that become possible when potential adversaries cooperate and collaborate.
- Technology-based regulation can sometimes encourage technological innovation, but it can also stifle it; pollution prevention is better than pollution control.
- Enhanced flexibility for achieving environmental goals, coupled with strong compliance assurance mechanisms--including enforcement--can spur private sector innovation that will enhance environmental protection at a substantially lower cost both to individual firms and to society as a whole.
- Science, economics, and societal values should be considered in making decisions. Quality information is essential to sound decisionmaking.
- Many state governments have developed significant environmental management capacity. Indeed, many of the most creative and lasting solutions arise from collaborations involving federal, state, local, and tribal governments in places problems exist--from urban communities to watersheds.

Learning to use new approaches to achieve interrelated goals simultaneously will be an evolutionary process. It needs to build on the strengths and overcome the limitations of current economic and regulatory systems and recognize the interrelationships between economic and environmental policies. This will require pursuing change concurrently on two paths: making the existing regulatory system more efficient and more effective, and developing an alternative system of environmental management that uses innovative approaches. Besides improving the cost-effectiveness of the current system, the Council believes that the nation needs to develop policy tools that meet the following broad criteria:

- **Provide Greater Regulatory Flexibility With Accountability.** The regulatory system must give companies and communities greater operating flexibility, enabling them to reduce their costs significantly in exchange for achieving superior environmental performance. While allowing flexibility, the system must also require accountability to ensure that public health and the environment are protected.

- **Extend Product Responsibility.** A voluntary system of extended product responsibility can be adopted in which designers, producers, suppliers, users, and disposers accept responsibility for environmental effects through all phases of a product's life.
- **Make Greater Use of Market Forces.** Sustainable development objectives must harness market forces through policy tools, such as emissions trading deposit/refund systems and tax and subsidy reform. This approach can substantially influence the behavior of firms, governments, and individuals.
- **Use Intergovernmental Partnerships.** Federal, state, and tribal governments need to work together in partnership with local communities to develop place-based strategies that integrate economic development, environmental quality, and social policymaking with broad public involvement.
- **Encourage Environmental Technologies.** The economic and environmental management systems need to create an environment that encourages innovation and the development and use of technologies that will create jobs while reducing risks to human health and harm to the environment.

Developing A More Cost-Effective Environmental Management System Based on Performance, Flexibility, and Accountability

In the past, government has relied mainly on regulatory approaches to managing environmental problems. Under this system, federal and state governments have set health-based standards, issued permits for discharges, and monitored and enforced standards set under each environmental statute. In some cases, regulations implementing these standards prescribe specific technologies to control pollution.

Over the years, the value and limits of this regulatory approach have become clear. There is no doubt that some regulations have encouraged innovation and compliance with environmental laws, resulting in substantial improvements in the protection of public health and the environment. But at other times, regulation has imposed unnecessary--and sometimes costly--administrative and technological burdens and discouraged technological innovations that can reduce costs while achieving environmental benefits beyond those realized by compliance. Moreover, it has frequently focused attention on cleanup and control remedies rather than on product or process redesign to prevent pollution.

Such concerns have contributed to a growing consensus that the existing regulatory system may be greatly improved by moving toward performance-based policies that encourage pollution prevention. Regulations that specify performance standards based on strong protection of health

and the environment--but without mandating the means of compliance--give companies and communities flexibility to find the most cost-effective way to achieve environmental goals. In return for this flexibility, companies can pursue technological innovation that will result in superior environmental protection at far lower costs. But this flexibility must be coupled with accountability and enforcement to ensure that public health and the environment are safeguarded.

Just as the manufacturing sector has adopted a goal of zero defects, the nation can aspire to the ideal of a zero-waste society through more efficient use and recycling of natural resources in the economy and more efficient use of public and private financial resources in the regulatory system. The nation should pursue two paths in reforming environmental regulation. The first is to improve the efficiency and effectiveness of the current environmental management system. The second is to develop and test innovative approaches and create a new alternative environmental management system that achieves more protection at a lower cost. To help achieve this, the administrator of the U.S. Environmental Protection Agency (EPA), working in partnership with other federal agencies and other stakeholders, should have the authority to make decisions that will achieve environmental goals efficiently and effectively.

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Although moving away from a one-size-fits-all approach will reduce costs to the private sector, creating an optional system could increase administrative and policy burdens on federal agencies, at least in the short term. Like clothing, custom-tailored environmental management may cost the public sector more to deliver than the off-the-rack variety. The new alternative system is designed to reduce aggregate costs to society, but it will require both industry and government to use new skills and resources, especially at the beginning. Negotiating facility-to-facility agreements is labor-intensive compared to administering permit compliance checklists. Developing facility-specific performance measures to ensure business accountability for negotiated goals is more expensive than enforcing uniform standards. Convening stakeholder workshops to reach agreeable environmental goals requires additional travel and staff time. The

system would also require a farsighted investment posture on the part of businesses seeking to break out of prescribed solutions to create their own. Nonetheless, the improved environmental protection system is designed to reduce total costs to the private and public sectors over time and will improve the nation's overall economic performance.

Partnerships and collaborative decisionmaking must be encouraged and must involve all levels of government, businesses, nongovernmental organizations, community groups, and the public at large. Initiatives are needed to verify that increased operational flexibility on a facility-wide basis can produce environmental performance superior to the current system while greatly reducing costs. To help ensure accountability, demonstrations also are needed to increase public involvement and access to information. The new system should facilitate voluntary initiatives that encourage businesses and consumers to assume responsibility for their actions. At the same time, the regulatory system must continue to provide a safety net of public health and environmental protection by guaranteeing compliance with basic standards.

Movement toward a performance-based system will be aided by public-private partnerships promoting the research, development, and application of cost-effective technologies and practices. Continued, long-term investment in technology will help ensure U.S. competitiveness and leadership in global technology markets. New manufacturing technologies and processes can lower material and energy use while reducing or eliminating waste streams. Focusing efforts to develop cleaner and more efficient products for domestic and overseas markets will help base U.S. economic growth on the concept of better--rather than just more--products and processes.

The Pollution Prevention Pilot Project

How can companies save money and cut down on waste and pollution? What are the public policy changes that would help companies innovate to increase their economic and environmental efficiency?

These questions brought together a group of experts from industry and the environmental community to learn how money-saving pollution prevention happens at the facility level. The Pollution Prevention Pilot Project (4P) is led by a core group from the Natural Resources Defense Council (NRDC), Amoco Petroleum, The Dow Chemical Company, Monsanto Company, Rayonier, and the New Jersey Department of Environmental Protection.

With a shared industry-environmentalist perspective, the core group, facility staff, and an experienced pollution prevention consultant have begun to identify opportunities to cut production and environmental costs while reducing and preventing pollution at two chemical manufacturing facilities--a Dow Chemical plant in La Porte, Texas, and a Monsanto plant in Pensacola, Florida. Early results show that major cost savings and significant environmental improvements can be achieved by looking for creative ways to address environmental issues.

Through site-specific work, the group is exploring what internal, external, or regulatory barriers may have kept the plants involved from already practicing cost-saving pollution prevention. Later, the group will try to craft policy proposals to spur more economically and environmentally sound innovation.

"The 4P initiative demonstrates that industry and the environmental community can work together for success--enhanced environmental improvements and economic savings. This is an excellent example of how innovative partnerships can yield more through our collective efforts than each could accomplish alone," says David Buzzelli, vice president and corporate director of Dow Chemical, and co-chair of the President's Council on Sustainable Development.

Adds John Adams, executive director of NRDC and a Council member, "What is exciting about this project is that it can produce tremendous environmental benefits by tapping the traditional strength of business--its ability to build a better mousetrap, to find better and more efficient ways of producing a product."

POLICY RECOMMENDATION 1

INCREASED COST-EFFECTIVENESS OF EXISTING REGULATORY SYSTEM

Accelerate efforts to evaluate existing regulations and to create opportunities for attaining environmental goals at lower economic costs.

ACTION 1. Federal and state environmental regulatory agencies should accelerate efforts to identify and act on opportunities to reduce the economic cost of current environmental regulatory standards. The private sector and other nongovernmental organizations have an important role in this process as catalysts for new ideas and approaches that will streamline and improve the current system. Government agencies should create more flexible, cost-effective approaches to attain the human and ecosystem health goals of existing programs while maintaining monitoring and verification functions. Regulated entities should still be responsible for demonstrating that they are achieving environmental goals.

In addition to achieving economic savings, improving the efficiency of the existing system would help set the stage for a longer term, more fundamental shift in the way in which human health and environmental quality are protected. The data, analysis, and lessons learned through these innovations can create a more solid base of experience from which to launch a new environmental management system that uses a wider range of policy approaches and tools.

ACTION 2. Federal and state environmental regulatory agencies should set performance-based regulations where feasible and appropriate. Performance-based regulations should be based upon national standards designed to protect the health of people and ecosystems.

"THERE AREN'T ENOUGH HOURS IN THE DAY"

They say small is beautiful. Evidence shows that in the United States, small businesses are where most new jobs are created. But when it comes to environmental regulations, small can be frustrating. Unlike large corporations, small businesses do not have departments dedicated to compliance, let alone someone who designs new ways of reducing pollution. How does a small business keep up with the paperwork? "There aren't enough hours in the day," says Robert Murphy.

Murphy -- chief executive office of Japs Olson Company, a Minneapolis-based printer, and chairman of the board of the Printing Industries of America -- has first-hand experience with the paperwork problem. His industry is dominated by small businesses: 80 percent of the print shops in the United States employ fewer than 20 people.[1] Printing is also a chemically intensive process, subject to a complex web of environmental laws, including dozens of state and federal regulations separately addressing air, water, and land pollution.

In 1993, the printing industry along with representatives from the Environmental Defense Fund (EDF) and the Council of Great Lakes Governors established the Great Printers Project, an effort focusing on printers in the Great Lakes Region. The aim of the project is to find ways to ease the compliance burden, reduce pollution, and lower costs. The three partners invited technical and policy experts from the U.S. Environmental Protection Agency (EPA) and state regulatory agencies to participate in the project as well. At the outset, Murphy said he felt himself in "perhaps the most diverse group I've ever dealt with. There was a certain amount of distrust." Over time the mood changed. "By the end, people were much different. After many, many hours of meetings, we learned to see each other's viewpoint."

On July 22, 1994, in conjunction with a Chicago meeting of the President's Council on Sustainable Development, the Great Printers Project released its findings, which included recommendations on how firms could save money and reduce pollution through voluntary actions. Following the group's recommendations, General Litho Services, a Minneapolis printer, successfully reduced its smog-inducing isopropyl alcohol use from 605 gallons to 95 gallons, saving $1,355. It reformulated its printing ink, which is listed as a hazardous waste, saving $18,000 in annual costs. At first glance these savings--both to the bottom line and to the environment--may seem small. But for small companies with narrow profit margins, they are

significant. And for the environment, the cumulative pollution prevention efforts can be even more significant.

Another recommendation was aimed at consolidating environmental reporting requirements to streamline administrative efforts. EPA Administrator Carol Browner, a Council member, endorsed the proposal, stating that it "will allow print shops to do their work cleaner, cheaper, and smarter." EDF Executive Director Fred Krupp, also a Council member, says these findings could be transferred to small businesses in other industries. "For industries composed of small businesses, focusing only on permits and inspections cannot attain environmental achievements," according to Krupp. "The Great Printers Project suggests replacing redundant bureaucracy with simpler forms that guide the small business person to reduce photochemical smog, hazardous waste, and wastewater discharges."

MANUFACTURING AND SUSTAINABLE DEVELOPMENT

Manufacturing will continue to be a critical part of the U.S. economy into the foreseeable future. This sector's activities have significant effects on the environment and on social equity and well-being. Consequently, it should aspire to produce, use, and export globally competitive goods and services that use resources efficiently and result in fewer adverse effects on natural systems and human health.

Many of the Council's policy recommendations seek to promote economic, environmental, and equity goals in the manufacturing sector. Two recommendations are to improve the cost-effectiveness of the existing system and to develop an alternative performance-based management system. They call for the creation of performance standards based on strong protection of health and the environment--but without mandating the means of compliance--to give companies and communities flexibility to find the most cost-effective ways to meet environmental requirements.

Recognizing that the greatest opportunity rests not only with producers, but also with those involved throughout the commerce chain, the Council challenges manufacturers, suppliers, users, and disposers of products to share responsibility for the environmental effects and waste streams throughout a product's life cycle.

In addition to a shift in tax policies and subsidy reform, greater use of market incentives would result in significant improvements in the environmental performance of the manufacturing sector at lower cost. Specifically, the Council urges federal and state governments to build on existing programs to design and carry out a system that allows the buying and selling of emissions

reductions, guaranteeing permanent overall reductions. Such systems should be appropriate to the local environmental problems being addressed. Further, the Council believes that the federal government should work with the private sector and nonprofit groups to identify cost-effective opportunities to use materials and energy more efficiently.

Progress toward this end could be measured using the following indicators:

- **Materials Use:** Increased efficiencies in the amount of virgin materials used per unit of gross domestic product by industrial sector, and increase in the market shares of renewable and recoverable resources.

- **Water Use:** Increase in recycled water used by industry and increase in groundwater recharge rates.

- **Energy Use:** Reduction in the amount of energy consumed per dollar value of economic activity by industrial sector.

- **Waste Generation:** Reduction in the generation and disposal of both commercial and household waste, and in toxic and regulated emissions.

- **Innovation and Technology Development:** Increase in the development, application, and export of services and technologies that prevent pollution by improving the efficiency of materials, energy, and water use and that reduce emissions or waste generation.

POLICY RECOMMENDATION 2

ALTERNATIVE PERFORMANCE-BASED MANAGEMENT SYSTEM

Create a bold, new alternative environmental management system designed to achieve superior environmental protection and economic development that relies on veriflable and enforceable perforinance-based standards and provides increased operational flexibility through a collaborative decision-making process.

Government has a central role to play and major responsibility to exercise in setting environmental protection standards that reflect a broad range of environmental, health, economic, and scientific factors, as well as other concerns. There are, however, significant economic and environmental benefits in allowing companies to participate in the process and in offering them a greater range of choice and flexibility in determining how to achieve needed levels of protection. But the new, more flexible approach needs to be an optional program. Some firms, because of circumstances and constraints, may prefer to continue under the more traditional regulatory program. Further, a new alternative system of regulation that shifts the burden of fashioning compliance strategies from government to industry will require a strong sense of trust among all stakeholders in the process - a level of trust that has not been part of the nation's past environmental efforts.

ACTION 1. Federal and state environmental regulatory agencies should give companies operational flexibility to determine the most cost-effective means of achieving the goals of superior protection. Regulatory agencies should enter into alternative compliance agreements with entities - facilities, companies, industrial sectors, or communities - that look beyond reductions in a single environmental medium - air, water, or soil - and encourage approaches to environmental management that are facilitywide and site specific. Regulatory agencies should ensure that the interests of heavily affected communities or socioeconomic groups are protected. In any new system, government agencies would still maintain monitoring and verification functions, and regulated entities would still have the responsibility to demonstrate that they are achieving the agreed-upon environmental objectives.

ACTION 2. Federal and state regulatory agencies and tribal governments should ensure opportunities for broad and meaningful public participation in the development and implementation of performance standards and regulations. These collaborative processes should afford other levels of government, businesses, nongovernmental organizations, and individuals the opportunity to participate in decisions affecting their future. Steps should be taken to ensure that traditionally under-represented groups have ample opportunity for involvement and that stakeholders have greater access to information on progress in achieving environmental goals.

ACTION 3. EPA and state agencies should accelerate efforts to conduct a series of demonstration projects to gain experience with policy tools and innovative approaches that could serve as the basis for an alternative environmental management system. They should be to work with all interested parties to tailor compliance terms of demonstrations that make a credible commitment to going beyond existing standards. For example, longer compliance periods might be considered for demonstrations that are designed to achieve superior protection, but this flexibility could be coupled with interim reporting requirements. Alternatively, demonstrations that focus on environmental performance of an entire facility rather than on separate air, water, and soil requirements might stipulate that environmental gains for an entire facility exceed what would have been achieved through source-by-source or medium-

specific regulations. These provisions would help ensure that all parties operate in good faith - an essential element of creating trust.

The federal government, working with the private sector and nongovernmental organizations, should review and evaluate the lessons learned from the demonstration projects. Based on the success of the first round of demonstration projects, a second set of projects should be selected within two years.

ACTION 4. National laboratories and federal research agencies should be directed to conduct research necessary to help develop, test, and verify the scientific basis of technologies and practices to move toward the ideal of a zero-waste society. This research would help ensure that over time the new system would reflect improved scientific information and understanding. Research agencies should identify health risks, monitor trends and environmental conditions, and inform decisionmakers of emerging environmental challenges. National laboratories should have the resources they need to help identify opportunities for public-private technology partnerships and be available to evaluate the effectiveness of new technologies and practices in attaining environmental goals at lower cost.

REGULATORY FLEXIBILITY AND ACCOUNTABILITY IN ACTION

Collaboration and experimentation both inside and outside the government and between government and private enterprise are leading to more effective ways of meeting environmental goals while reducing costs. Through the Common Sense Initiative, the U.S. Environmental Protection Agency (EPA) has convened consensus-oriented teams to look for opportunities to turn complicated and inconsistent environmental regulations into comprehensive sector-spedfic strategies for environmental protection.

Six major industries are the focus of the project's first phase: automobile manufacturing, computers and electronics, iron and steel, metal finishing, petroleum refining, and printing. These major industries account for more than 11 percent of the gross domestic product, employ nearly 4 million people, and generate a significant portion of the toxk releases reported.

Representatives from federal, state, and local governments; community-based and national environmental groups; environmental justice groups; labor; and industry are examining the full range of environmental requirements affecting the six pilot industries. Teams are working to find cleaner, cheaper, smarter approaches in the areas of regulation, reporting, compliance, permitting, and environmental technology - emphasizing pollution prevention instead of end-of-pipe controls.

Project XL is a second example of regulatory flexibility and accountability in action, this time looking at specific facilities rather than specific industries. Six companies - Intel Corporation, Anheuser Busch Companies; HADCO Corporation; Merck & Co., Inc.; AT&T Microelectronics; and 3M Corporation - and two government agencies - Colifomia's South Coast Air Quality Management District and the Minnesota Pollution Control Agency - will participate in the first phase of the Project XL initiative. Denoting Excellence and Leadership, Project XL allows selected businesses and communities to experiment with innovative and flexible strategies to achieve greater environmental results, while providing regulatory flexibility and maintaining accountability. For example, Intel will enter into a contract with EPA and the Arizona Department of Environmental Quality for its new facility in Chandler, Arizona. As proposed, the company will agree to achieve better environmental results than are currently required for air, land, and water pollution. For their part, regulators will grant Intel more regulatory flexibility and expedited permitting procedures, making it easier for the company to meet the higher environmental goals.[2]

On November 3, 1995, President Bill Clinton announced the selection of Intel and the other five firms chosen for the first phase of Project XL: 'To industry, Project XL shows that protecting the health and safety of our citizens doesn't have to come at the expense of a bottom line. And to those in the environmental community, XL shows that strengthening the economy doesn't have to come at the expense of the air we breathe, the food we eat, the water we drink.'

POWER, LEG ROOM, AND 80 MILES TO THE GALLON

Early in the next century, customers could have an exciting new option when they shop for a new automobile. They may be able to purchase cars that achieve up to 80 miles to the gallon, are mostly recyclable, accelerate from 0 to 60 miles per hour in 12 seconds, comfortably hold six passengers, meet all safety and emissions requirements, and cost about the some as comparably sized cars on the showroom floor.

This new generation of car could represent more than a breakthrough in fuel efficiency and design. It would also represent a breakthrough in cooperation among competing automobile manufacturers and among the automobile industry, suppliers. universities, other small and large businesses, and the U.S. government.

On September 29, 1993, Vice President Al Gore and the chief executive officers of the Ford Motor Company, Chrysler Corporation, and General Motors Corporation announced a historic Partnership for a New Generation of Vehicles. The partnership has three objectives: to improve national competitiveness in manufacturing, to promote commercially viable near-term innovation, and to develop a vehicle that is up to three times more efficient than today's comparable vehicle. Achieving this level of fuel economy would stretch the boundaries of technical capability. Underlying these goals is yet another challenge: affordability.

Vice President Gore, meeting with members of the President's Council on Sustainable Development, received an update on the partnership effort during a January 1995 visit to Chattanooga, Tennessee. "By the end of 1997, we will narrow the technology focus. By 2000, we will have a concept vehicle. And by the year 2004, we will have a production prototype," declared a representative of the partnership. "This is not just about jobs," he added. "It is not just about technology. It is not just about the environment. It is also about a new process of working together, for both industry and government, in ways that have not been attempted before."

Adopting Extended Product Responsibility

While environmental programs that focus on a point in the product chain have resulted in resource conservation and pollution prevention, further advances will only be incremental ones as long as the approach taken continues to separate all stages of economic activity, including product design, manufacture, use, and disposal. For example, when looking to reduce air emissions of a particular chemical associated with a product, the production plant is often not the only place to examine. Sometimes, more cost-effective and larger reductions can be found by analyzing emissions from transporting and distributing the product. A life-cycle approach captures the upstream environmental effects associated with raw material selection and use and effects from production processes and product distribution. It also reflects downstream effects associated with product use, recycling, and disposal. Life-cycle approaches can yield better environmental results at lower cost.

Extended product responsibility is an emerging principle that uses this life-cycle approach to identify strategic opportunities for pollution prevention and resource conservation. It also addresses the underlying influence of consumer needs and preferences, government procurement, and the role played by those in the chain of production and distribution. Under the principle of extended product responsibility, manufacturers, suppliers, users, and disposers of products share responsibility for the environmental effects of products and waste streams.

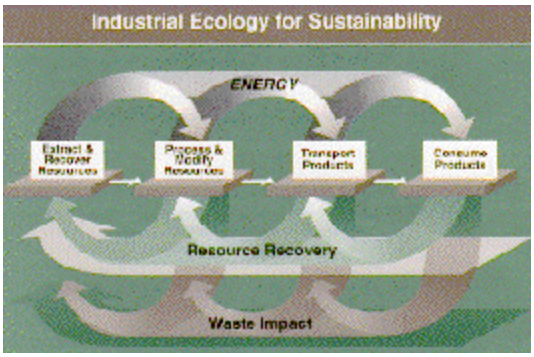
Creating an innovative system of extended product responsibility would improve the current fragmented approach to waste reduction, resource conservation, and pollution prevention. When there are missing links in the chain of responsibility, waste and inefficiency result. Communities bear the greatest burden for the disposal of hazardous products. Similarly, decisions made upstream in the chain by suppliers can reduce a manufacturer's emissions and wastes and improve profitability. Sharing responsibility implies not only understanding and communicating the environmental effects of product development but also acting collectively to reduce them. By using a mix of regulatory and other incentives, information, education, and institutional support, this new system would encourage individuals, government, and corporations to recognize, understand, and act on the basis of their responsibility to advance sustainable development objectives. Further, government agencies - the nation's largest consumers - can use their market leverage to encourage U.S. manufacturers to increase the efficiency of materials use. Purchasing specifications can give manufacturers strong incentives to create products that result in fewer environmental effects while maintaining similar product performance.

This policy recommendation constitutes a challenge to the American people to develop models of shared responsibility and demonstrate how these models can be put into effect across the

country and throughout the world. For example, liability regimes must be consistent with any shifts of product responsibility. A series of demonstration projects that illustrate new models of shared responsibility throughout different product systems could provide valuable experience with extended product responsibility. While extended product responsibility should constitute a national priority, actions of states and localities are integral to its success. Ultimately, the Council believes that sharing responsibility for environmental effects would transform the marketplace into one driven by:

- More efficient use of resources;
- Cleaner products and technologies;
- More efficient and more competitive manufacturing;
- Safer storage, shipping, and handling of materials;
- Improved relations between communities and companies;
- Improved recycling and recovery; and
- Responsible consumer choices.

FIGURE 11



NOTES: Industrial ecology is the study of a closed loop in which resources and energy flow into production processes, and excess materials are put back into the loop so that little or no waste is generated. Products used by consumers flow back into production loops through recycling to recover resources. Ideally, the loops are closed within a factory, among industries in a region, and within national and global economies.

SOURCE: Office of Science and Technology Policy, Technology for a Sustainabie Future (Washington, D.C., 1994).

POLICY RECOMMENDATION 3

EXTENDED PRODUCT RESPONSIBILITY

Adopt a voluntary system that ensures responsibility for the environmental effects throughout a product's life cycle by all those involved in the life cycle. The greatest opportunity for extended product responsibility rests with those throughout the commerce chain - designers, suppliers, manufacturers, distributors, users, and disposers - that are in a position to practice resource conservation and pollution prevention at lower cost.

ACTION 1. Companies, trade associations, wholesalers, retailers, consumer groups, and other private sector parties can develop models of shared product responsibility. Private sector parties should solicit the participation of government and environmental representatives in developing voluntary product responsibility models or demonstration project proposals. Fach demonstration project proposal should identify critical links in the product chain, opportunities for significant improvements, and key participants that need to be involved to prevent pollution or conserve resources within each product system under consideration.

ACTION 2. A joint committee involving the private and nonprofit sectors should recommend to the President individuals to be appointed to a Product Responsibility Panel to review and select demonstration projects, help identify appropriate participants, and provide advice on the execution of the demonstration projects themselves. Demonstrations should include companion training and educational programs to communicate the objectives of the demonstrations and principles of extended product responsibility. The Product Responsibility Panel should help identify means of conducting effective monitoring, evaluation, and analysis of the projects' progress and possible links with other sustainable development initiatives. It should also help coordinate sound economic and environmental analyses to assist in transferring the lessons from local demonstration projects to regional and national policies. The panel should have a balanced representation of stakeholders with interests in the life cycle of a product, including its supply, procurement, consumption, and disposal. By immediately identifying product categories for demonstration projects, U.S. industry, in cooperation with government agencies and the environmental community, could begin to carry out the new models of shared responsibility to produce rapid and measurable results. Necessary measures to protect against the extension of product liability would encourage the voluntary assumption of responsibility by businesses.

ACTION 3. Following evaluation of the projects, the federal government, private companies, and individuals should voluntarily adopt practices and policies that have been successfully demonstrated to carry out extended product responsibility on a regional and national scale. The Product Responsibility Panel should recommend any legislative changes needed to remove barriers to extending product responsibility. The procurement policies of federal, state, local, and tribal governments should reflect preferences for resulting cost-effective, environmentally superior products.

FROM THE TOP OF A MOUNTAIN TO THE HEART OF THE CITY

Ever wonder what happens to those recycled plastic soda bottles? just take a walk along a mountain trail on a crisp autumn day. Many of the brightly clad hikers will be sporting jackets that were once soda bottles. Pile jackets, produced from petroleum-based fibers, have been worn for over two decades; today, many are made from recycled plastic bottles.

One producer of the recycled fabric is Malden Mills, a century-old business located in the Lawrence/Methuen area of Massachusetts. Malden estimates that in 7995 about 20 percent of the pile it manufactures will come from recycled soda bottles. With each jacket using around 20 bottles, more than 140 million bottles each year will be in clothing rather than in landfills. Along with using 60 times less new plastic, recycled fibers discharge 17 times fewer pollutants, six times less sulfur dioxide, and four times less carbon dioxide.

"The whole notion of product stewardship - minimizing waste, water use, energy use, chemical use - as well as how we work with our customers and suppliers is a fundamental principle of our company," says Walter Bickford, Maiden's environmental manager. "You need to encourage top-down and bottom-up support within the corporation and along each step in the supply chain."

One of Molden's customers, Patagonia, an outdoor clothing company, is also wrestling with the concept of corporate stewardship. Its founder, Yvon Chouinard, discusses his concerns in the book Sacred Trusts. "Other than shutting down the doors and giving up, what Patagonia can do is to constantly assess what we are doing. With education comes choices, and we can continue to work toward reducing the damage we do. In this process, we will face tough questions that have no clear-cut answers. Should we add a bit of synthetic fiber in a cotton fabric if it makes a pair of pants lost twice as long? Which is better to use - toxic chemical dyes or natural dyes that are less colorfast and will fade?"

For businesses like Malden and Patagonia, stewardship extends beyond products and includes a strong commitment to the communities in which they are located. Molden's hometown at Lawrence is a struggling New England mill town where the population is half its post-World War II peak of 90,000. Starting in the late 1950s, it faced a population exodus as textile firms migrated South or overseas. By the 1980s, acres of downtown Lawrence were a vast wasteland of abandoned buildings. Malden, which employs 2,SOO workers at its Lawrence factory, is now the city's largest employer and has a strong influence over the health of its economy.

"Stewardship ultimately comes back to growth policy and land use planning," says Bickford. "For us, that means sticking with a depressed and crime-ridden city. It means renovating our turn-of-the-century brick factory that lies in the heart of that city. It means a workforce that is 70 percent minority, paid union wages. It means educating ourselves, our employees, and the community. In sum, it means achieving product excellence with social responsibility."

[Before our report went to press, Malden Mills was struck by a tragic fire which destroyed much of the factory. Molden's president, Aaron Feuerstein, recently announced that the company plans to rebuild the plant on the same location as soon as possible.]

TOOLS FOR EXTENDED PRODUCT RESPONSIBILITY

A variety of tools can help make extended product responsibility a reality. Some, like labeling programs, inform consumers. Others, like product fees, put a value on environmental impact. All help decisionmakers recognize and respond to opportunities to change. These tools may focus on individual actions or reflect coordination among many participants in the chain of commerce. The tools used for a particular product category should be designed to achieve the desired change at the most appropriate links in the chain, and, where possible, by voluntary action. Following are exomples of these tools.

Product Stewardship Programs and Public-Private Partnerships: Stewardship programs typically deal with the downstream environmental and safety aspects of product use. Many companies and organizations already have voluntary programs of this nature. Examples include the U.S. Environmental Protection Agency's Green Programs such as the Energy Star initiatives; Chemical Manufacturers Association's Responsible CareR program; Environmental Defense Fund/McDonald's partnership; and initiatives by the Business Council for Sustainable Development, Coalition for Environmentally Responsible Economies, International Standards Organization, National Association of Chemical Distributors, and Synthetic Organic Chemical Manufacturers Association.

Take Back, Buy Back, Leasing, or Reuse/Recycling: Under take-back or buy-back systems, products, packaging, or waste materials are retumed to their source for reuse, recycling, treatment, or safe disposal This mitigates downstream environmental effects and permits recovery of valuable materials. Take-back programs are not appropriate for all product categories, such as those that are extremely complex or where recycling infrastructure already exists, but there are many valid applications. Under leasing systems, ownership of materials or products is never transferred, thus encouraging manufacturers to close material flow loops and extend product life. Reuse or recycling by other manufacturers also closes material flow loops.

Education, Information, or Training: Purchasers and users can be given information to facilitate informed environmental decisions. Information can be made available through labeling, product literature, and certification programs. What is important is a continuous flow of information from the designer to the manufacturer, to the user, and back to the designer.

Government Subsidies, Tax Credits, and Procurement Preference: Direct subsidies or tax credits can encourage sustainable processes and products. Because a national priority is usually the justification for a subsidy or tax credit, these tools should not conflict with the goals of sustainability and should be revenue neutral. Federal, state, local, and tribal governments can exert influence in the marketplace through their purchase specifications for environmentally superior products.

Taxes/Fees or Deposit/Refund Systems: Taxes and fees can add the value of environmental effects to the costs of materials and products, making them relatively less preferable in the marketplace. Taxes and fees can also be used to shift the cost of waste management to the waste generator. Examples include taxes on automobile tires and variable pricing for household wastes.

RESPONSIBLE CARE*

When the Vista Chemical Company expanded its Lake Charles, Louisiana, plant's ethylene unit, community members expressed concern about high flames coming out of a stock. "Our neighbors were afraid of the high flames and unhappy about the vibration and noise caused by the flares," according to Nancy Tower, community relations coordinator at the Lake Charles plant. "That's why we held assembly meetings at local schools, distributed information to the media, ond sent mailers out informing the community about the flare's role as a sofety and control device." Ultimately, the company decided that the only way to really address community concern was to purchase a flare tip to reduce the noise. Tower notes, "This is an example of the public outreach that we ore committed to and the dialogue that Responsible Care encourages." Responsible Care is an initiative that provides the ethical framework within which member and partner companies of the Chemical Manufacturers Association (CMA) operate. It was adopted in 1988 and is continually subject to critical appraisal with an eye toward improved implementation. All CMA members and partners pledge to abide by 10 underlying principles, which include recognizing and responding to community concems about chemicals and plant operations; developing and producing chemicals that can be manufactured, transported, and disposed of safely; making health, safety, and environmental considerations a planning priority; reporting promptly on health or environmental hazards and recommending protective measures; pursuing relevant research and communications activities, and participating with government and others in creating responsible laws, regulations, and standards to safeguard the community, workplace, and environment. A public advisory panel composed of individuals from the public and private sectors meets four times a year and helps CMA identify public concerns and decide how to respond to them, reviews Responsible Care's codes of management practices, and evaluates other features of the initiative.

In sum, says Fred Webber, president of CMA, "Through Responsible Care, the chemical industry has taken a significant step toward satisfying the public's desire for both useful products and a safe and clean environment. The chemical industry's commitment to following through on

performance improvement is unprecedented. In my opinion, Responsible Care is more than a good initiative - it's the industry's franchise to operate."

*Responsible CareR is a registered trademark of the Chemical Manufacturers Association.

Greater Use of Market Forces

In the American economic system, the marketplace plays a central role in guiding what people produce, how they produce it, and what they consume. The choices and decisions made by millions of consumers and firms determine prices for the wide range of goods and services that constitute the national economy. The marketplace's power to produce desired goods and services at the lowest cost possible is driven by the price signals that result from this decentralized decision process.

Despite the nation's commitment to a free market economic system, governmental policy substantially influences the workings of the marketplace. For example, tax levels on different products and activities lower or raise their market prices and artificially encourage or discourage their use. Some government subsidy programs encourage activities that result in economic inefficiency as well as destructive use of resources. At other times, government tax and spending subsidy programs may be essential if the short-term rewards of the marketplace do not coincide with the long-term goals of the nation. To ignore the importance of economic policy is to miss opportunities to encourage economic, environmental, and equity goals.

To improve environmental performance, the design of environmental and natural resource programs should take advantage of the positive role the marketplace can play once environmental goals and market signals are aligned. Current policies generally do not use the power of the marketplace, and at present, some environmental costs in the product chain may be shifted to society at large, rather than be fully reflected in the product price. The cost of air, soil, and water pollution associated with materials and energy used in production as well as the expense to local communities for product disposal are two examples of costs not typically included in a product price. But if these types of costs are reflected in the price of a product, the marketplace sends an important signal. All other things being equal, consumers generally will purchase the lower priced product, creating an important incentive for a company to reconsider how it makes a product. Increasing the use of market forces can create opportunities to achieve natural resource and environmental goals in the most cost-effective way possible by encouraging the innovation that flows from a competitive economic system.

Examples of market incentive strategies include greater use of systems that allow regulated firms to buy and sell emissions reductions rather than more traditional pollution control approaches, reform of governmental tax and spending policies, and more comprehensive measures of economic performance.[4]

PRESERVING THE LONG ISLAND PINE BARRENS

For more than 20 years, developers, environmentalists, and local government officials in Suffolk County, New York, waged a costly and emotionally charged battle over the Pine Barrens, a 100,000-acre expanse of rare pitch pines and scrub oak forest located on Long Island. In addition to being valued natural habitat, the Pine Barrens rest atop a vast underground aquifer that provides water for the residents of Suffolk County, one of the most densely populated counties in the nation. The prolonged and intense conflict over the Pine Barrens eventually culminated in a lawsuit brought by the Long Island Pine Barrens Society.

In 1993, weary of litigation and stung by a real estate recession, the parties to the dispute and other stakeholders, aided by the Suffolk County Water Authority, joined together to help the state legislature draft a bill that led to the creation of the Pine Barrens Commission. The commission promotes a distinctive management plan for the region, which, except in special hardship cases, will prohibit further development in a 52,500-acre core preservation area, of which 14,000 acres are privately-owned, and will foster efficient, compact development in a surrounding 47,500-acre growth area and outside the central Pine Barrens altogether. It will achieve this not only through outright purchase of some land but through an innovative market-oriented method to preserve vital areas.

Under the plan, landowners in the core area whose property is not acquired outright but who cannot build on it, can sell their development rights for use in outlying areas that are suitable for higher density development than local zoning currently allows. The plan has identified three types of receiving areas: areas where residential development may increase modestly, areas where commercial density may increase, and planned development districts where densities may increase substantially. The result is a program that offers a cost-effective and equitable way to preserve land with the potential to improve the future shape of communities on the periphery of the Pine Barrens.

Across the United States, communities are struggling to save ecologically important areas while also allowing for growth and development. The use of transfer of development rights helps address this challenge by harnessing market incentives to allow developers, environmentalists, and local citizens to implement new methods for long-term community planning.

Tax Shift and Subsidy Reform

It became increasingly apparent as several of the Council's task forces grappled with various aspects of sustainable development that tax policy is an important consideration in formulating strategies for achieving the desired goals.

The Council believes a tax system should be designed to raise sufficient revenues without discouraging capital formation, job creation, environmental improvement, and social equity. Currently, the federal government raises more than $1 trillion per year, predominantly (nearly 90 percent) by taxing wages and personal and corporate income.[5] And since tax policies influence individual and institutional investment patterns and consumption decisions, the Council believes that an effective use of the tax system could be a powerful tool in meeting the challenges of sustainable development. Council members wrestled with the question of whether these challenges could be met, in part, by shifting some of the nation's taxes to activities and forms of consumption that are economically bad for society--inefficiency, waste, and pollution--and away from those that are economically good--employment, income, and savings and investment.

Ideally, a tax system that supports the recommendations of the Council would promote economic growth and jobs in a socially equitable manner, while discouraging pollution and other forms of inefficiency. The Council believes substantial progress in reaching these objectives can be made through revenue-neutral system improvements--changes that shift the ways revenues are raised without increasing overall tax obligations. In addition to revenue neutrality, tax reform efforts must be guided by the following criteria:

- Tax policy must ensure that individuals and families at different income levels are treated as fairly as possible. We, as a Council, strongly believe that taxes should not place a disproportionate burden on lower income individuals and families, and we recognize the limitation of some options - such as the value-added tax or a national sales tax - in meeting this criterion. Federal tax policy must address social equity to be consistent with the goals of sustainable development.

- The tax system must promote savings and investment, employment, and economic growth. The Council is firmly convinced that any tax shift should encourage savings, private investment, and job creation.

- Tax-based policy should also be more skillfully employed to provide for enhanced environmental performance. While there was strong support among many of the Council members to shift tax policy from "taxing goods to taxing bads," there was no consensus regarding any of the specific policy options discussed. However, the Council acknowledged that there is sufficient merit to market mechanisms, such as pollution taxes and taxes on consumption, to warrant further evaluation. Moreover, the Council did agree that any tax shift needs to be done gradually, will not obviate the need for legally enforceable environmental standards or agreements, and should be designed to increase the efficiency of national efforts to improve environmental quality.

Although special tax, spending, and credit provisions may have been economically justified at some time in the nation's development, they may no longer be serving their original purposes and instead may have unintended side effects that run counter to national economic and environmental objectives.

In addition to recognizing the need for alignment of tax policy with the goals of sustainable development, the Council emphasized the need to examine the practical effects of various kinds of subsidies, some of which are obvious and appear to conflict with the Council's goals. As this nation moves toward a more sustainable society, the Council believes that it is absolutely essential to scrutinize existing subsidies and to determine their efficiency in advancing the goals of sustainable development.

POLICY RECOMMENDATION 4

SHIFT IN TAX POLICIES

Begin the long-term process of shifting to tax policies that -- without increasing overall tax burdens -- encourage employment and economic opportunity while discouraging environmentally damaging

ACTION 1. A national commission should be established to review the effect of federal tax and subsidy policies on the goals of sustainable development. The commission would have two major responsibilities. First, it should conduct an explicit assessment of alternative tax policies and, in particular, should assess opportunities for increased use of pollution taxes while reducing reliance on more traditional income taxes. The commission should make recommendations to the President and Congress on tax reform initiatives that are consistent with the goals of economic prosperity, a healthy environment, and social equity.

production and consumption decisions.

Second, the commission should review all existing tax and spending subsidies to determine if there remains a national need to continue individual subsidies. The commission should recommend to the President a list of subsidies that fail to meet this test and should be phased out or rapidly eliminated. Any remaining subsidies should be made subject to a sunset or review clause that would require the appropriate government agency to ensure on a regular basis that these subsidies are not inconsistent with national sustainable development goals; otherwise they would be eliminated.

POLICY RECOMMENDATION 5

SUBSIDY REFORM

Eliminate government subsidies that encourage activities inconsistent with economic, environmental, and social goals.

Unlike the tax reform proposal above, subsidies have been the subject of analysis and debate and their likely economic, environmental, and equity effects are relatively well-known. Proposals to reform subsidies have been prevented in the past by intractable political barriers that have proven very difficult to overcome. Hence, the commission should also evaluate alternative mechanisms for addressing these political hurdles. Modifications to the U.S. Tax Code or the elimination of subsidies would result in short-term dislocations, but would provide long-term benefits for the nation as a whole. The commission should evaluate and act on remedial or preventive steps to mitigate any short-term effects.

ENERGY AND SUSTAINABLE DEVELOPMENT

Decisions on energy production, distribution, and use can have important effects on the U.S. and global environment, the prices of most basic goods and services, international competitiveness,

and national and economic security. Changes in technology and economic behavior offer an effective way to reduce the environmental and social burden associated with energy production and use. Cost-effective investments in energy efficiency, for example, lead to economic, environmental, and equity benefits by reducing energy costs and environmental effects. The energy sector and individual citizens can strive to improve the economic and environmental performance of energy use to enhance national competitiveness and social well-being.

It is important to recognize the global context of energy issues in shaping strategies for the future. If people in developing countries follow U.S. patterns of development, consume similar amounts of resources, and generate as much pollution, they will reinforce many unsustainable trends and undermine global progress in reducing environmental problems. Solutions and innovations developed for challenges in the United States can be adapted to conditions in developing countries to help them achieve their economic, environmental, and equity aspirations.

A number of the Council's policy recommendations would remove institutional, economic, and regulatory barriers that prevent progress toward achieving sustainable development in the energy sector. For example, the increased regulatory flexibility envisioned by the Council under an alternative performance-based management system would encourage energy efficiency as a method of pollution prevention. For many industries, introduction of innovative technologies that prevent pollution and lower compliance costs typically decreases energy consumption. The industries that produce the most pollution and incur the highest abatement costs -- chemicals, petroleum refining, pulp and paper, and primary metals -- also consume the most energy.[6] Successful research and development aimed at pollution prevention and waste minimization would reduce pollution remediation costs as well as consumption of energy and raw materials. Federal research and development technology partnerships are catalysts for innovation and can also create important economic incentives as part of an alternative performance-based management system.

Other policy recommendations that would help foster progress in the energy sector include shifting tax policies, reforming subsidies, and making greater use of market incentives as discussed earlier in this chapter. Progress in this area can be gauged using the following indicators:

- **Energy Use:** Reduction in the amount of energy consumed per dollar of gross domestic product.

- **Renewable Energy:** Increase in the share of renewable energy use in the U.S. energy supply.

- **Electricity Efficiency:** Increase in the average efficiency of electricity generation.

- **Greenhouse Gas Emissions:** Reduction in U.S. emissions of greenhouse gases due to human activity and a continued downward trend in other regulated pollutants

POLICY RECOMMENDATION 6

USE OF MARKET INCENTIVES

Make greater use of market incentives as part of an overall environmental management system to achieve environmental and natural resource management objectives, whenever feasible. This system must provide for veriflcation, accountability, and the means to ensure that national standards are met or exceeded.

ACTION 1. Federal and state governments should build on existing programs to design and carry out a system that allows the buying and selling of emissions reductions guaranteeing permanent overall reductions. Such systems should be appropriate to the environmental problems being addressed and local conditions. If applied appropriately, this approach would reduce the costs of meeting air and water quality standards without compromising human and environmental health.

ACTION 2. The federal government should work with the private sector and nonprofit groups to identify cost-effective opportunities to reuse and recycle materials. For example, federal, state, local, and tribal governments should use such information to design procurement policies to encourage new markets for recycled materials that will create jobs.

ACTION 3. States could develop incentives for energy-efficiency investments during the transition from highly regulated to more competitive electricity market forces to create a decentralized approach to investments in energy efficiency.

Energy efficiency is a primary tool of sustainability because it can help achieve the interdependent objectives of improving the economy,

increasing equity, and reducing environmental costs. Despite the substantial efficiency gains of the past 20 years, consumers and industry can still save energy cost-effectively by using newer technologies and improved practices. Many of the least affluent in society have not yet reaped the economic gains from energy efficiency because of lack of financial resources and access to technology. And because current patterns of energy production exact a toll on the environment, energy efficiency can directly reduce environmental effects.

Over the past two decades, energy markets have become more competitive and direct governmental influence has waned. This is an evolution that has brought significant benefits for consumers and contributed to more efficient energy use. For example, the natural gas and electricity markets have moved from being completely regulated to being partially regulated with the introduction of new competitive forces. However, this transition to increased competition needs to be managed with efficiency and the environment in mind. Specifically, many analysts question whether even the best energy conservation programs currently in place will survive the transition to more competitive markets. Also unclear is the extent to which businesses will take advantage of opportunities in this area and respond with innovative approaches to replace traditional demand-side conservation programs. Energy efficiency should continue to be emphasized during the period of transition and beyond.

One approach would be to replace the existing patchwork of utility-sponsored conservation programs with temporary market-based approaches. Under this concept, states would place a small fee on all electricity users. The revenue collected would be placed into an energy efficiency fund awarded to electricity suppliers that compete for the opportunity to install cost-effective energy-saving equipment at a partially defrayed cost. The competition for projects would largely replace traditional bureaucratic programs with an active market in energy efficiency.

It is clear that residential, commercial, and small manufacturing

customers, for example, that do not already engage in extensive demand-side conservation efforts would benefit from programs of this type. However, many large facilities that may be subject to global competition already make significant investments in energy efficiency as a business mainstay. In these cases, incentive programs involving surcharges may not be warranted.

ACTION 4. Congress should enact legislation to remove provisions in current laws prohibiting state and local governments from developing market-based transportation management strategies that more fully reflect travel costs. The U.S. Department of Transportation should encourage states and manufacturers to work together to standardize technology specifications to enable communities interested in doing so to adopt common standards for electronic road and parking pricing technologies.

States and localities that choose to use these market tools should apply the revenues to offset cuts in nontransportation taxes and to enhance the public transit and transportation systems, maintenance, and services. The revenues should also help finance toll discounts, exemptions, and/or rebates for low-income commuters who need to use the roads to travel to jobs during times of the day when tolls are collected. All levels of government should consider offering funding bonuses to areas that implement road user fees more fully. Bonuses should be available to states or regions that achieve measurable improvements in reducing transportation-related pollution, energy consumption, or vehicle miles traveled.

Building Intergovernmental Partnerships

When the current system of environmental management was created some 25 years ago, most state governments did not have the capacity to operate environmental regulatory programs. This is no longer the case. As the environmental regulatory system has matured, many states have developed strong programs.

Two related reforms are now in order to help shift the focus from the narrow goal of environmental protection to the broader goal of sustainable development. The first reform is to move from a federally focused governmental decision-making structure to a collaborative design that shares responsibility among levels of government. The second reform is to shift the focus from centralized environmental regulation organized around separate programs to protect air, water, and land to a comprehensive place-based approach. It should be designed to integrate economic, environmental, and social policies to meet the needs and aspirations of localities while protecting national interests.

To accomplish these reforms, the new system will need to rely heavily on partnerships among federal, regional, state, local, and tribal levels of government. These partnerships will require unprecedented cooperation and communication within and among levels of government in a geographic area. For example, carrying out a community-designed sustainable development strategy may depend on close collaboration by a local economic development agency, a regional transportation authority, a state housing department, and a federal environmental agency.

This shift in focus to place-based partnerships will require major changes in the roles and responsibilities of federal and state regulatory agencies in communities interested in accepting new local responsibilities. The agencies should help build local decision-making capacity so that communities can begin to develop integrated economic, environmental, and social equity strategies themselves. Rather than simply issuing regulations from afar, these agencies will need to work in communities and provide information and technical assistance.

Along with the devolution of responsibilities to states and localities, however, some traditional responsibilities must be preserved. For example, the federal government must continue to establish consistent national standards to ensure uniform levels of protection across state lines. Greater flexibility is needed - not in the standards themselves, but to encourage greater efficiency in determining the means to attain such standards. In addition, in the development and implementation of place-based strategies, federal agencies must continue to represent and protect national interests that may not be represented by local interests in all cases. Examples include controlling transboundary pollution and protecting biodiversity.

POLICY RECOMMENDATION 7

INTERGOVERNMENTAL PARTNERSHIPS *Create intergovernmental partnerships to pursue*	**ACTION 1.** Federal agencies should develop effective partnerships with state governments to administer environmental regulatory programs. These partnerships should eliminate duplicative activities and greatly reduce federal oversight of state programs that have a proven track record. Savings from

economic prosperity, environmental protection, and social equity in an integrated way.

eliminating duplication and unnecessary oversight should be dedicated to cover some of the increased public sector costs associated with regulatory flexibility and place-based partnerships. States should also share in the increased flexibility when using federal grant monies, conditioned on performance-based measures of environmental results agreed upon by federal and state agencies.

ACTION 2. Federal and state agencies should enter into partnerships with communities that wish to develop and carry out sustainable development strategies designed to address local circumstances.

ACTION 3. Federal agencies should work with national associations representing regional, state, local, and tribal governments to create model guidance that could be issued to government employees to encourage cooperation and communication among and within government agencies in geographic areas where place-based sustainable development strategies are being developed.

TRANSPORTATION AND SUSTAINABLE DEVELOPMENT

The U.S. transportation system plays a critical role in the everyday lives of millions of Americans. Access to affordable transportation is necessary for people to work, recreate, and purchase goods. Transportation choices, land use patterns, community design, and pollution are inherently linked. Further, transportation affects national and economic security as it increasingly accounts for the largest share of oil consumed in the United States - two-thirds in 1994.[7] The nation can aspire to improve the economic and environmental performance of the U.S. transportation system while increasing all Americans' access to jobs, markets, services, and recreation.

This report outlines many steps that can be taken by government at all levels, communities, businesses, and residents to address the challenge of a sustainable transportation system. The

recommendations and actions listed below are presented in chapter 4, "Strengthening Communities."

- Improve community design to contain sprawl better, expand transit options, and make efficient use of land within a community to locate homes for people of all incomes, places of work, schools, businesses, shops, and transit in close proximity and in harmony with civic spaces.

- Shift tax policies and reform subsidies to improve economic and environmental performance and equity in the transportation sector significantly.

- Make greater use of market incentives in addition to changes in tax and subsidy policies to achieve environmental objectives.

- Accelerate technology developments and encourage public-private collaboration to move industrial sectors closer to economic, environmental, and equity goals.

- Progress in the transportation sector could be measured using the following indicators:

  - **Congestion:** Decrease in congestion in metropolitan areas.

  - **National Security:** Increase in economic and national security through reduced dependency on oil imports.

  - **Transportation Efficiency:** Decrease in the rates of freight and personal transportation emissions of greenhouse gases and other pollutants, including carbon monoxide, lead, nitrogen oxides, small particulate matter, sulfur dioxide, and volatile organic compounds.

  - **Transportation Patterns:** Progress toward stabilizing the number of vehicle miles traveled per person while increasing the share of trips made using alternative transportation modes.

[1] U.S. Department of Commerce, Bureau of the Census, *Census of Manufacturing* (Washington, D.C.: Government Printing Office, 1995), p. 13.

[2] The Common Sense Initiative and Project XL are outlined in "Regulatory Reinvention (XL) Pilot Projects," *Federal Register* 60, no. 99 (May 1995): 27282; and U.S. Environmental Protection Agency, Office of Communications, Education, and Public Affairs, "Project XL: Innovative Projects in Environmental Excellence and Leadership," press release (Washington, D.C., 3 November 1995).

[3] Yvon Chouinard, "Patagonia: The Next Hundred Years," in Michael Katakis, ed., (San Francisco: Mercury House, 1991).

[4] For example, in the 1990 amendments to the Clean Air Act, Congress authorized the trading of sulfur dioxide emission allowances. See Clean Air Act Amendments of 1990, Pub. L. 101-549, 104 Stat. 2399.

[5] U.S. Department of Commerce, *Statistical Abstract of the United States 1994* (Washington, D.C.: Government Printing Office, 1994), p. 330, table 504; and p. 331, table 505.

[6] U.S. Congress, Office of Technology Assessment, "Industry, Technology, and the Environment: Competitive Challenges and Business Opportunities" (Washington, D.C., 1994), p. 190.

[7] U.S. Department of Commerce, *The Effect of Imports of Crude Oil and Refined Petroleum Products on the National Security* (Washington, D.C., 1994), p. ES-4.

Chapter 3

Information and Education

Information and education, in both formal and nonformal spheres, have a tremendous potential for increasing citizen awareness and ability to engage in decisions affecting their lives. Key to this strategy is managing information better, expanding access to the decision process, measuring progress toward societal goals more comprehensively, and incorporating accounting measures that educate and enable decisionmakers and individuals to make decisions that are more economically, environmentally, and socially sustainable. Additionally, the country's formal education system must be reformed to better address sustainability, and nonformal education forums and mechanisms tapped to promote opportunities for learning about sustainability.

THE CHALLENGE OF a new century offers the opportunity to create an educational, outreach, and informational system geared to the demands of a changing world, starting with basic and advanced skills and moving to job training and civic engagement. Equipping citizens with skills and knowledge will enable them to participate productively as members of local, national, and global communities. Continuing educational opportunities throughout people's lives--both in formal and nonformal learning settings--will enable them to adapt to changing economic conditions and respond to the need for environmental protection. Building a knowledge of the interdependence among economic prosperity, environmental protection, and social equity will help citizens understand, communicate, and participate in the decisions that affect their lives.

Information to Improve the Quality of Life

Quality of life in a free society is determined by the collective decisions of its individual citizens acting in the home, the workplace, and together as members of the community. To make decisions that will help achieve the nation's economic, environmental, and social goals and improve the quality of life, people in all sectors of society need a solid grounding in the core academic subjects and access to lifelong educational opportunities, as well as accurate information about sustainable development. With education and access to quality information, citizens, government, and businesses are likely to find more efficient and equitable solutions to

problems, to reach decisions that use economic and natural resources more efficiently, and to participate effectively in decisions concerning their families and communities.

Widely available information will become increasingly important as the United States moves to a new framework that places greater responsibility on individuals and the private sector to work cooperatively in making decisions that promote a balance among economic, environmental, and social issues. Informed decisions will create a more market-based regulatory framework--one that is more effective and flexible and less intrusive than the present system. The informed involvement by all government levels, the private sector, and individuals is needed to take such actions as:

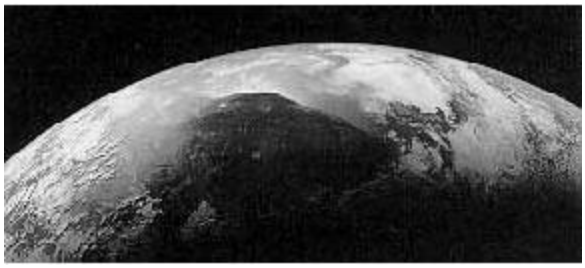
- Establishing baselines for setting pollution reduction targets;
- Identifying risks and priorities;
- Developing innovative solutions;
- Understanding the consequences of individual actions; and
- Measuring progress toward economic, environmental, and equity goals.

Managing Information for Sustainable Development

Accurate information is vital to sound decisionmaking, and the federal government has an important continuing role in helping to ensure the quality and integrity of public information, whether generated by government or the private sector. Citizens--both as private individuals and as members of the business community--depend on the quality and timeliness of information to alert them to hazards and to make informed decisions that promote economic and social welfare. As sustainable development focuses attention on new environmental, social, or economic concerns, government must perform this critical management function more effectively to ensure the quality and timely availability of new kinds of information.

Government already has collected an abundance of information, but often it is not available to policymakers or the public in a form they can use. This is the case with natural resources information, a subject explored in chapter 5, "Natural Resources Stewardship." A critical management issue is thus to improve the availability and usefulness of government information. Also, duplicative data collection should be eliminated, and data coordination and management should be improved. This will reduce costs and ensure that valuable information is not lost or wasted.

The federal government is already participating in collaborative efforts with the public, the private sector, and nongovernmental organizations to improve information management. These efforts should be expanded to include priority setting for data collection and analysis, identification of the most useful formats for dissemination, and additional mechanisms to help ensure that communities can obtain the information needed to guide sustainable development at the local level. At the same time, the federal government should work with the private sector to inform the public about consumer choices through disclosure of appropriate information in such areas as health, safety, the environment, and the social impact of products and services.



POLICY RECOMMENDATION 1

BETTER INFORMATION MANAGEMENT

Improve the collection, organization, and dissemination of information to reduce duplication and streamline reporting requirements while giving decisionmakers information related to economic, environmental, and equity goals.

ACTION 1. The federal government working with state and local Governments, private businesses, and the public--should thoroughly review and revamp how it collects, organizes, and disseminates data on economic, environmental, and social conditions and on demographic and health trends. The outcome should be improved coordination among federal agencies to better meet the needs of information users.

ACTION 2. Federal agency information system plans and programs should be included in agency submissions under the Government Performance and Results Act (GPRA).1 Rather than manage their information-gathering and -processing activities by such elements as cost and the number of personnel involved, agencies have been directed under GPRA to manage programs according to their outcomes or products. This approach should be used to ensure that money spent by the federal government on information leads to the production and dissemination of information that meets the needs of the public and policymakers.

ACTION 3. The federal government should lead an effort to reduce duplication of information by integrating the efforts of various authorities. The U.S. Environmental Protection Agency (EPA) has launched a major effort to consolidate its reporting requirements into a one-stop format, initially through a Key Identifiers Project that will eliminate the burden on individual business facilities to report the same information multiple times on separate forms.[2]

ACTION 4. All levels of government should coordinate their programs on comprehensive regional inventories and assessments of environmental, economic, and social indicators of progress.

Strengthening Scientific Information

The ability to achieve sustainable development depends on scientific knowledge of the Earth's natural systems and the ways in which human activities affect these systems.

Accurate information built on basic scientific research establishes the foundation of knowledge needed for sound decisionmaking by individuals, businesses, government, and society as a whole. It helps people understand and predict changes in the environment, manage and restore natural systems, prioritize the potential risks associated with environmental problems, and take advantage of opportunities from technological developments. The private sector uses science to develop new technologies, production processes, and goods and services. In addition, baseline scientific data are critical to developing community-based sustainable development strategies.

POLICY RECOMMENDATION 2

BETTER SCIENCE FOR IMPROVED DECISIONMAKING

Strengthen the base of scientific knowledge and increase its use by decisionmakers and the general public.

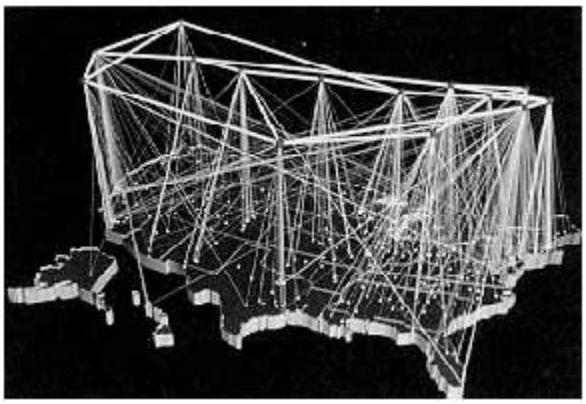
ACTION 1. Government, the private sector, the scientific community, and nonprofit organizations should support or conduct long-term, independent scientific research to help decisionmakers understand sustainability issues, including the relationship among human and natural systems, human health issues, and emerging global problems such as global climate change and the loss of biodiversity.

ACTION 2. The federal government should promote international cooperation on scientific research related to sustainability.

ACTION 3. Current scientific research should be disseminated broadly and in ways that help policymakers, individuals, businesses, and communities make decisions that promote sustainable development.

ACTION 4. Government and the private sector should support and encourage research to improve risk assessment and cost-benefit analysis and to enhance their use as two tools among many in policymaking.

Expanding Access to Information



Information can be a powerful tool in making institutions accountable, building trust, and empowering citizens to take greater responsibility for economic and environmental improvement. Sustainable development requires that communities have the ability to compile and link disparate sets of data to create the information bases needed for effective decisionmaking.

For example, in the late 1980's the federal government for the first time required firms to disclose publicly the total quantities of hundreds of chemicals they released into the environment. The disclosures of toxic releases under the Emergency Planning and Community Right-to-Know Act quickly led to voluntary reductions--more than 40 percent in the first five years--and contributed to dialogue between companies and communities.[3] Many companies now voluntarily report far more broadly on environmental performance and invite community representatives to observe, evaluate, and help improve company operations. Implementation of

the Emergency Planning and Community Right-to-Know Act demonstrates that complex data can be made available to the public in a manner useful to society. By illustrating a company's commitment to stewardship, these voluntary disclosures of Toxic Releases Inventory data also build credibility and public support for a more flexible regulatory process. Trust in open processes and broad disclosure and dissemination of information are central to sustainable development.

Information--coupled with public education - is central to harnessing the power of the marketplace to reinforce more sustainable practices. For example, accurate product information, such as consumer product labeling and financial disclosure requirements, helps people make informed decisions regarding their personal and financial well-being. Accurate ecosystem data allow communities and regional areas to plan and carry out sustainable development strategies.

More efficient use of energy and materials by households is essential to making the United States more sustainable. The energy and natural resources used in American households have a significant impact on sustainability. With accurate information, consumers are more likely to make choices that save economic and environmental resources. Households also affect product design and manufacturing decisions through their purchases in the marketplace. If individuals are aware of the benefits and buy products that are cleaner to produce, use, and dispose of, they will reward the manufacturers, distributors, and retailers of those products by purchasing them. As individuals develop more environmentally and economically responsible consumer practices, they often become more aware of and active in bringing about the changes that local and national institutions need to make so society can reward those who use resources efficiently.

Sustainable development must be inclusive, and the Council believes that the nation cannot be divided between information "haves" and "have-nots" without major social inequities. Some individuals and communities have little access to information and lack the skills and training to make use of it. The issues of affordability and access to the National Information Infrastructure must be squarely addressed as key components of sustainable development. Further, training and community capacity-building are key components for widespread assumption of responsibility for sustainable development. Schools, libraries, nongovernmental organizations, governments, and the private sector are all central players in providing the necessary training and in building and sustaining the capacity of all communities to use information to support wise decisionmaking.

POLICY RECOMMENDATION 3

IMPROVED ACCESS TO INFORMATION

Adopt open information policies and practices, recognizing that disclosure and active dissemination of information should be the rule, not the exception. Adopt policies that increase access to public information for all segments of society and encourage the development of the National Information Infrastructure by the private sector in ways that improve access for all.

ACTION 1. New collaborative and flexible regulatory approaches require open processes to identify and communicate baseline measurements and improvements in environmental performance. All sectors must ensure that the new environmental management system recommended in chapter 2, "Building a New Framework for a New Century," provides sufficient access to information so progress can be tracked and verified.

ACTION 2. Individual, government, and business purchasers should ask suppliers to provide information on environmental characteristics of products and should factor these considerations into their purchasing decisions.

ACTION 3. The federal government should encourage agencies to ensure that the standards and formats used to provide access to public information are consistent throughout the government so that members of the public and policymakers can effectively search within and across agencies for information.

ACTION 4. The federal government, the private sector, and local communities should promote widespread public access to computers, computer skills training, and information available through computer networks such as the Internet to allow access to sustainable development information.

POLICY RECOMMENDATION 4

INFORMATION FOR SUSTAINABLE LIVING

Endorse and promote awareness of the economic, environmental, and social benefits of sustainable practices--

ACTION 1. The federal government should encourage and facilitate the creation of and access to information and data on sustainable development and sustainable living, such as ways to use resources more efficiently.

ACTION 2. Local governments, businesses, and community groups should create demonstration projects that increase citizen awareness of the effect sustainability has on the quality of life. These demonstration projects should help individuals identify

such as more efficient resource use in government, the private sector, and the home--and encourage local governments, businesses, and community groups to engage people in making these improvements.

opportunities to use resources more efficiently and achieve lasting measurable results.

Measuring Progress Toward National Goals

Thick books of statistical tables, piles of computer printouts, or databases buried in government computers are not the forms in which information is most accessible or useful. Development of simplified formats for presentation and reporting of information would help all sectors of society reach more fully informed decisions. Such indicators of performance can be powerful tools for measuring progress toward national goals for sustainable development. They can enable the public and policymakers alike to assess readily whether policies are working and the nation is moving in the desired direction.

For example, use of a daily clean air index in a city increases awareness among citizens about local air quality and enables them to take steps to protect themselves and their children. Where local air quality poses health threats such as asthma, community advisories increase awareness and promote individual, community, and private sector solutions to reduce the risks to vulnerable groups.

This report has identified priority national goals for sustainable development and potential indicators of progress toward those goals. Some are based on information that is easy to identify and capture; others will require more work to allow effective measurement. Still others may change or be replaced as understanding grows of the underlying scientific, economic, and social options associated with sustainable development goals.

The federal government can draw on existing resources without creating a new organization to establish indicators. The Council notes that an interagency process is already under way within the executive branch to identify and develop indicators. Moreover, the information technology revolution provides new opportunities for decentralized dissemination and flow of information.

Regular reports should be made on national indicators of performance and progress toward the goals of sustainability. The federal government should link this indicator effort to work on information bases and indicators already being done. The national indicators and the information used to create them should be made widely available and accessible, particularly to regional and local governments and organizations creating their own indicators.

POLICY RECOMMENDATION 5

INDICATORS OF PROGRESS

Develop indicators of progress toward national sustainable development goals and regularly report on these indicators to the public.

ACTION 1. The federal government should continue and intensify the current interagency effort to develop national indicators of progress toward sustainable development. This should be a collaborative effort that involves the private sector and nongovernmental organizations.

ACTION 2. Federal agencies should regularly provide information in a useful format to other levels of government and private sector entities that are also working to create sustainable development indicators.

ACTION 3. State, county, and local governments should create their own indicators of sustainable development.

OREGON BENCHMARKS -- INDICATORS OF PROGRESS

In 1989, Oregonians faced unprecedented population growth, a diversifying economy, and a resource crisis in both the timber and salmon industries. The 1990s were sure to be a time of transformation and upheaval Change was inevitable, but citizens hoped to guide the direction of change toward a shared vision of the state's future.

They set their sights high. "We want to be a state at well-educated, competent people living in thriving communities, working in a well-paying, competitive economy, and enjoying a pristine environment," according to the Oregon Progress Board, a group formed by the state legislature and chaired by the governor. The group was created to keep Oregon focused on its vision of the future and to assess trends affecting this vision. The Oregon Benchmarks represent one such tool.[4]

How do benchmarks work? just as blood pressure, cholesterol levels, and weight serve as indicators of a patient's health, Oregon has selected benchmarks to serve as indicators of the state's well-being. Oregon's 259 benchmarks are organized according to core and urgent indicators. Core indicators examine primary and long-term issues for the state: family stability; capacity; enhanced quality of life and the environment; and promotion of a strong, diverse economy. Urgent indicators examine critical issues facing the state, such as endangered wild salmon runs and rising teen pregnancy rates. The two sets are closely linked. According to the Oregon Progress Board, "Failure to reach urgent benchmarks in the near term threatens our ability to achieve other, more fundamental, benchmarks years down the road." Each year, the board collects public comments, refines its benchmarks, and updates the data.

"The Oregon benchmarks are about vision, commitment, priorities, and measuring our goals," observes Barbara Roberts, Oregon's governor from 1991 until 199S. 'We turned a strategicpian into a new way of thinking and working. Our state has learned the true meaning of collaboration. We know we need each other to reach our benchmarks. We test our work against measurable results that recognize that our efforts are not about categories or levels of government. but rather about citizens well-served and problems solved."

Improving National Income Accounts

The United States tracks how well the economy is performing through national income accounts, which give decisionmakers valuable information. One of the most common measures of the nation's financial health is the gross domestic product (GDP), a national income indicator that measures the dollar value of all products and services bought and sold in the economy. Most countries have adopted similar measures. GDP is an immensely valuable gauge of how American economic markets perform and, therefore, of whether the country is better or worse off in a financial sense.

It is an incomplete and imperfect measure, however, of how well-off the nation is in terms of sustainable development goals. It does not account for environmental quality or cultural and social resources. GDP treats natural resources simply as something consumed to produce other economic goods and services. It does not measure the cultural or spiritual wealth of a nation, nor does it illustrate how economic wealth is distributed among the individuals within a society. And, in general, it provides little insight into how well a nation is safe guarding the economic, educational, and cultural opportunities of future generations.

For example, current national accounting procedures treat use of natural resources as an addition to GDP and thus as economic growth. But using natural resources at a faster rate or in ways that preclude replenishment also imposes a cost on the economy. There would be, for example, fewer forests, fish stocks, or minerals to consume later. Better accounting of the costs of using natural resource stocks would encourage better management of present and future consumption of these resources.

If the United States is serious about sustainable development, it needs to generate better tools for measuring the public value - including the economic value - of the things that are important to the nation. Without these tools, society will not have the information it needs to know how well the country is doing and what remains to be accomplished. While national indicators of public well-being will never be capable of measuring all factors fully, such as measuring the cultural and spiritual wealth of a society, they will provide better measures and fuller information on which to base choices and important decisions than are presently available.

National indicators of public well-being will build on the information identified, gathered, and disseminated in addressing the national goals and their indicators of progress. In the interim, national income accounts can be improved to reflect several other elements of economic prosperity that are inherent in the Council's recommended goals for sustainable development.

POLICY RECOMMENDATION 6

SUPPLEMENTAL NATIONAL INCOME

Establish a supplemental system of satellite national income accounts thatprovides integrated measures of the economy, the environment, and the natural resource base.

ACTION 1. The federal government should continue to develop methods to measure quantity and quality of renewable and nonrenewable resources, such as forests, lakes, minerals, and fish populations. These measurements should include the economic value of degrading or restoring air, water, and soil quality. Agencies should work closely with academic experts and resource producers, users, and other stakeholders in this effort.

ACTION 2. Decisionmakers should begin to consider the implications of satellite income accounts as measures that expand on information from GDP and the net domestic product when making choices that affect the economy and/or the environment.

ACTION 3. The U.S. Department of Commerce should work with other nations on behalf of the United States to ensure that these new accounting methods are eventually standardized among countries.

Broadening Business Accounting Practices

Many businesses are integrating environmental concerns into all facets of their operations to increase their competitiveness in the global marketplace and to address public concerns about the environment. Environmental accounting can provide the information to help them identify

opportunities to reduce both production costs and potential environmental threats through more effective environmental management.

Companies spend money to meet environmental objectives, whether on a voluntary or mandatory basis. Environmental costs include capital expenditures for pollution control equipment and salaries for staff who specialize in this area. Companies also spend money on the environment in other areas, such as operations and maintenance, labor, research, and marketing.

Unfortunately, standard business accounting practices bury the lion's share of environmental costs in non-environmental accounts and fail to trace costs back to the activities that generate them. As a result, managers often make crucial business decisions - what products to manufacture and what technologies and materials to use - without all the relevant facts. With a better understanding of a firm's actual environmental costs, managers and workers can identify opportunities to increase profits by using materials and energy more efficiently and so better protect public health and the environment.

Those who practice environmental accounting realize it is not a one-time exercise relegated to the periphery of a company. To ensure lasting benefits, it must be incorporated into ongoing business practices, including strategic planning, product development, and capital budgeting.

POLICY RECOMMENDATION 7

ENVIRONMENTAL ACCOUNTING

Develop and adopt accounting practices that link environmental costs with the products, processes, and activities that generate them to provide better information for business decisions.

ACTION 1. National business associations can work with their memberships to develop and adopt voluntary sustainable business practices, including accounting for the consequences of environmental practices and profitability.

ACTION 2. National business associations can provide technical assistance to small and medium-sized companies that are interested in identifying the range of costs associated with environmental management and innovative ways to reduce these costs while increasing environmental protection and economic productivity.

ACTION 3. Colleges and universities that offer degrees in accounting and business administration can offer courses on environmental accounting.

Education for Sustainability

Education for sustainability is the continual refinement of the knowledge and skills that lead to an informed citizenry that is committed to responsible individual and collaborative actions that will result in an ecologically sound, economically prosperous, and equitable society for present andfuture generations. The principles underlying education for sustainability include, but are not limited to, strong core academics, understanding the relationships between disciplines, systems thinking, lifelong learning, hands-on experiential learning, community-based learning, technology, partnerships, family involvement, and personal responsibility.

Access to information is crucial in a democracy; but that information is useful only if citizens can put it into a framework of knowledge and use it to solve problems, form values, and make choices. That is where education comes in. Education for sustainability can give people the tools, skills, and experience they need to understand, process, and use information about sustainable development. It will help them make individual and collective decisions that both benefit themselves and promote the development of sustainable communities. And it will provide a means for creating a more highly skilled and globally competitive workforce and developing a more informed, active, and responsible citizenry. These objectives make it clear why education for sustainability is an integral part of the Council's long-term strategy for rebuilding communities and the country for the 21st century. How can education for sustainability be accomplished?

Education for sustainability must involve everyone. Education should flow from school to community and back again. Educators at all levels should reach beyond school walls, as many successful programs already do, to involve parents, industry, communities, and government in the education process. Colleges and universities should work with schools and communities - to deliver information, to identify questions for research, and to provide direct services to help solve community problems. For their part, communities should take a stronger interest in educating their citizens for sustainability, recognizing that current and future generations will need to be well-educated on this topic in order to bring about a sustainable future.

Education for sustainability must be a continuous process with widespread application. It thrives in all types of classrooms, exposing students to local, state, national, and international issues through hands-on, experiential leaming in alternative educational environments - such as wading through streams to do water quality testing, volunteering in the community, or participating in

school-to-work programs. Because sustainability is all-encompassing, learning about it cannot and should not be confined to formal settings such as schools, universities, colleges, and training institutions. Nonformal education settings, such as museums, zoos, extension programs, libraries, parks, and mass media, provide significant opportunities to complement and build on classroom learning. This means that formal and nonformal educators must work together to produce an educated citizenry.

Education for sustainability is about connections. Educating for sustainability does not follow academic theories according to a single discipline but rather emphasizes connections among all subject areas, as well as geographic and cultural relationships. Rather than weaken the rigor of individual disciplines, education for sustainability offers an opportunity to strengthen them by demonstrating vital interrelationships. For example, Dartmouth College requires students to take an international leadership course stressing business and environmental components. The Kellogg School at Northwestern University sponsors an elective course that involves a spring-break trip to places like Costa Rica to research such initiatives as the ecotourism industry and paper production from the waste products of banana processing. The Crouse School of Management at Syracuse University has a mandatory course focusing on what business students need to know about the environment; it also offers courses on land development law and environmental law as part of the business school curriculum. Students must strive to achieve high standards within the core disciplines, even as they develop an understanding of the connections across these disciplines. Further, education for sustainability involves a consideration of diverse perspectives, including those of ethnic groups, businesses, citizens, workers, government entities, and other countries.

Education for sustainability is practical. While delving into many disciplines, education for sustainability helps students apply what they leam to their daily lives. It engenders a sense of efficacy. Part of sustainability education is leaming citizenship skills and understanding that citizens do have the power to shape their lives and their communities in light of their vision of a healthy and prosperous future.

Education for sustainability is lifelong. Continual efforts should be made to institute programs about sustainability in nonformal educational settings, including the workplace and community centers and through the media. A citizenry knowledgeable about the benefits of sustainable living will have the capacity to create and maintain lasting change. Benefits to the individual include an understanding of and ability to participate in the social and economic changes that will affect their lives. For example, many communities have used

planning processes that engage citizens in defining a desired future plan for their community. Using their plan, citizens work to achieve a sustainable future for themselves and their children.

An educated public is one of America's most powerful resources to meet the challenges created by increasing environmental, economic, and social demands. Our policy recommendations address both formal and nonformal educational settings and acknowledge the lifelong nature of effective education. These recommendations also address an array of crosscutting issues that relate to formal and nonformal education alike - such as technology, partnerships, equity, and international concerns. Together, these recommendations form a comprehensive educational strategy that promises to help lead the nation to a more sustainable future.

FRIENDS OF THE FUTURE

Seventh-, eighth-, and ninth-grade students from the St. Francis of Assisi School in Louisville, Kentucky, have created a voice for themselves and other youth in the state by forming Friends of the Future (FoF). With their teacher, Sheila Yule - who, according to one student, "pulls everything together and is the core of the group" - Friends of the Future members have set an ambitious local, state, and international agenda.

Locally, they are examining what they can do as individuals and as a group to protect and enhance the environment and their community. Students regularly conduct environmental testing and have alerted the city council to a variety of water quality problems in their community; in fact, they have helped prompt legislative changes to address the situation.

Across the state, FoF members are working in partnership with a consortium of schools and universities, state agencies, and students from other environmental groups to develop strategies to better organize and incorporate environmental and sustainable development education into the Kentucky school curriculum.

FoFs international mission is to raise awareness of the United Nations'Agenda 21 and of the role youth need to play in the discussion on sustainable development. Through the sponsorship and support of the U.N. Environment Program, FoF published the book, We Got the Whole World in Our Hands: A Youth Interpretation of Agenda 21, which documents the proceedings of the 1992 U.N. Conference on Environment and Development.s The book puts Agenda 21 into simple language - easy for younger readers to understand. The students presented their version at the national Earth Summit in Louisville in May 1993.

Reforming Formal Education

In the 1960s and 1970s, environmental education focused on natural resources conservation; in the 1980s, this curriculum was broadened to emphasize ecology and pollution control as well. Today, environmental education is evolving toward education for sustainability. Education for sustainability is not an add-on curriculum -- that is, it is not a new core subject like math or science. Instead, it involves an understanding of how each subject relates to environmental, economic, and social issues. Educating for sustainability promotes both high standards of achievement in all academic disciplines as well as an understanding of how these disciplines relate to each other and to the concepts of environmental quality, economic prosperity, and social equity. But how should education for sustainability be transferred from conceptualization to practice?

Educators -- working in partnership with communities, businesses, and other stakeholders -- can make education for sustainability a reality. Specifically, for various levels of formal education, they should define the skills and knowledge students will need in order to understand how various human actions affect the environment, economy, and equity. This understanding will be achieved most effectively if teachers makes these connections to core academic subjects. Educators can encourage students to discuss these effects and form their own opinions. To this end, materials that incorporate hands-on learning methods -- which can be highly effective in fostering an appreciation of complex, real-world issues -- and that promote an understanding of how subjects relate to each other need to be developed. Finally, measures should be established to evaluate student progress in this area.

Because it is a relatively new concept for teachers as well as for students, education for sustainability needs to be incorporated into teacher preservice and in-service education programs. Wisconsin's preservice teacher certification programs, for example, include environmental education objectives; the state also has a large in-service program in environmental education. Both have elicited strong support from students, teachers, and school administrators. The Environmental Literacy Institute at Tufts University provides environmental literacy training to secondary school teachers and university faculty. The institute exposes participants to current educational theory, teaching strategies, assessment techniques, and information retrieval methods. Its nine-day participatory learning course covers such topics as life-cycle assessment, design for environment, cost-benefit analysis, market-driven technological innovations, and responsible industry practices. Today, teachers and professors in subjects ranging from English

to engineering are incorporating environmental principles into their courses. Such programs offer examples of incorporating sustainability into educational training and teaching programs.

Colleges and universities also play a strategic role in educating for sustainability. Not only can these institutions develop curricula that integrate sustainability concepts, they can also incorporate these concepts into a wide range of activities, including research projects, career counseling, administrative procedures, procurement practices, academic curricula, and other university services. Through a partnership with the EPA, The George Washington University in Washington, D.C., is doing just that: sustainability concepts underlie much of its administrative and curriculum activities. The results of practical research or model greening projects conducted at universities and colleges also can be shared with the community and other school systems. Blueprint for a Green Campus, a collaborative effort of universities and colleges nationwide, describes ways to make sustainability a central focus of educational programs and to provide community and regional forums to discuss sustainability.[6]

POLICY RECOMMENDATION 8

FORMAL EDUCATION REFORM

Encourage changes in the formal education system to help all students (kindergarten through higher education), educators, and education administrators learn about the environment, the economy, and social equity as they relate to all academic disciplines and to their daily lives.

ACTION 1. Parents and representatives from states, schools, educational organizations, community groups, businesses, and other education stakeholders should identify the essential skills and knowledge that all students should have at specified benchmark grades for a basic understanding of the interrelationships among environmental, economic, and social equity issues. This could serve as a model for states and communities to use in setting their own requirements for academic performance.

ACTION 2. State officials, school administrators, and other educators and stakeholders should continue to support education reform; emphasize systems thinking and interdisciplinary approaches; and pursue experiential, hands-on learning at all levels, from elementary and secondary schools to universities, colleges, community colleges, and technical schools.

ACTION 3. Colleges and universities should incorporate education about sustainability into preservice training and in-service professional development for educators of all types, at all levels, and in all institutions.

ACTION 4. Schools, colleges, and universities should promote curriculum and community awareness about sustainable development and should follow sustainable practices in school and on campus.

GLOBAL HANDS-ON LEARNING

Students, parents, teachers, and school administrators met on the grounds of Jamestown Elementary School in Arlington, Virginia, awaiting the arrival of Vice President Al Gore, who was visiting the school to launch another GLOBE (Global Leaming and Observation to Benefit the Environment) site. GLOBE, started by the Vice President in 1994 and supported by several federal agency partners - the National Science Foundation, the National Oceanic and Atmospheric Administration, the U.S. Environmental Protection Agency, the U.S. Department of Education, and the National Aeronautics and Space Administration (NASA) - is designed to link teachers, students, and scientists around the world in a study of the environment. Says Jamestown principal Nicki Smith, "GLOBE is going to revolutionize education."

So how does GLOBE work? Basically, it is a hands-on scientific experiment. Teachers are trained to help students test soil, gauge air and water temperatures, study plant species and clouds, and measure the height and diameter of trees. These data are then posted on the Internet via the World Wide Web for use by students, scientists, and NASA. "It's exciting, electrifying," says Joseph Squeo, a fifth-grade teacher at Royle Elementary School in Darien, Connecticut, who is one of 12 teachers in that state being trained to run GLOBE programs at their own schools. "This program is unique because it makes students and teachers a part of a scientific experiment. We have ownership. We can get involved and be a part of the scientific study of the Earth. We're going to be doers and participants, and that is what is going to appeal to kids today."

To date, more than 2,500 schools in the United States and 32 partner countries have signed up as GLOBE sites. In order to be ready for the program's kick-off on Earth Day 199S, they planned and prepared for more than a year. Preparations included teacher and student training and creation of the necessary computer and telecommunications infrastructure in their schools.

Scientists are already benefiting from the information collected by the students. "We don't have the time or the capability or the research funding to do the work these students are doing," William Lawrence, a research scientist at the University of Maryland, remarks. Says Neal Pettingill, an 11-year-old Jamestown student involved with the program, "You're not just doing it to learn stuff, but you're actually helping scientists figure out what they need to help the Earth."

Providing Opportunities for Learning Outside the Classroom

People of all ages can learn about sustainable development in a variety of ways, including museums, zoos, libraries, extension programs, the media, their places of work, and community organizations. These nonformal educational settings can expand awareness and put concepts about sustainability in a familiar context. To be most effective in doing so, nonformal educational institutions need to work closely with formal educators to identify those areas in which schools are inadequately preparing students and to help fill those gaps and develop appropriate materials. This section highlights several nonformal settings that can play a key role in lifelong learning about and citizen involvement in sustainability.

Raising public awareness is central to any plan to move the nation toward sustainability. If citizens are to reverse such negative trends as urban sprawl, loss of biodiversity, and decreasing voter turnout, they must understand the issues and have accurate and accessible infon-nation about sustainability. In general, people rely on the mass media for their news and information. A 1995 Roper poll found that 72 percent of survey respondents obtained most of their news and infon-nation from television, 38 percent from newspapers, 18 percent from radio, and 8 percent from magazines.[7] Therefore, it is crucial that the mass media be knowledgeable about sustainability and able to translate it into a language that everyone can easily understand.

A national extension service, which collects and disseminates information on particular topics of interest, could be used to meet the research, technology transfer, and community needs generated by those interested in charting a sustainable course. It could make information on sustainability widely available to the public, schools, media, communities, and businesses and could clarify and infuse sustainability issues into the nation's environmental, economic, and social agendas. Various federal agencies have developed extension services that can serve as models for a

Sustainable Development Extension Network: the U.S. Department of Agriculture's Cooperative Extension Service, the National Oceanic and Atmospheric Administration's Sea Grant program, and the National Aeronautics and Space Administration's Space Grant program. Alternatively, the existing Cooperative Extension Service could be restructured to focus on interrelated issues in communities, agriculture, forestry, manufacturing, and other economic sectors.

Community organizations offer another way to teach citizens about sustainability. Across the country, people are working in community groups to plan for sustainability. In Portland, Oregon, Chattanooga, Tennessee, and Seattle, Washington -- just to name a few examples -- citizens are participating in community "visioning" exercises. Through these, they typically envision a safe and healthy community with parks, walking and bike paths, good schools supported by parents and community organizations, affordable and clean housing, recreational facilities, museums, and libraries. They envision clean, energy-efficient transportation to replace traffic jams and road noise; and clean, safe, and friendly streets. These planning exercises are powerful tools in creating a sustainable future. By enabling communities to plan proactively -- rather than function reactively -- and by providing the information and technical expertise that communities need to realize their sustainable development plans, all citizens can help transform their neighborhoods into safe, healthy, and economically prosperous communities. Chapter 4, "Strengthening Communities," provides a detailed discussion about local initiatives. including community planning and goal setting, and training issues.

Educating youths and adults in the skills needed for the jobs and careers of the 21st century is a major ingredient in sustainable development. As jobs around the world become increasingly technology- and information-oriented, only those countries with an educated, skilled workforce will be able to achieve economic stability - the stability that in turn continues to provide jobs paying liveable wages. Thus, as the next century, approaches, all citizens will need access to job training and retraining opportunities throughout their work lives. This makes the workplace another important venue for nonformal learning about sustainability. For example, school-to-work opportunities offered through partnerships between industry and educators can help provide young people with the knowledge, skills, and career information they need for the future. Employers and educators should work together to determine and plan for current and future employees' education, training, and continuing education needs.

COLOR ME GREEN

"People say, we're only children. People say, what can we do. Can't you see we are the future, and right now we're depending on you?" These are the words of songwriter Mike Nobel. They are powerful to read, but just imagine the impact when a group of students known as the Color Me Green singers put these words to music. Mike Nobel's songs and the Color Me Green singers are part of the Color Me Green campaign in Portland, Maine, to build awareness of environmental, community, and intergenerational issues.

Now in its third year, the award-winning campaign has been made possible by an enthusiastic partnership involving the local television station 6ALIVE, businesses, state regulatory agencies, environmental groups, educators, parents, and students. The campaign features four components: Nobel's songs, produced as music videos and aired as public service announcements; a series of "Ecotips," individual actions thot people can carry out in the community; "Earth Notes" which describe current issues, such as what industries are doing to become more environmentally responsible; and a public education proqrom that disseminates a Color Me Green school kit to schools throughout the state.

The Color Me Green campaign has been a huge success. The National Association of Broadcasters awarded it first place at the 1994 Service to Children Awards, and said that the campaign, "reflects the best of what America represents." And the fame of the Color Me Green singers is spreading. The group's recordings and videos have been circulated around the world and have received international acclaim. As one of their songs says, "Cause everything we do today can change our tomorrow. And maybe when kids lead the way, the whole world will follow."

POLICY RECOMMENDATION 9

NONFORMAL EDUCATION AND OUTREACH	**ACTION 1.** Nonformal educators should encourage lifelong learning about sustainability through adult education programs, community and civic organizations, and nonformal education

Encourage nonformal access to information on, and opportunities to learn and make informed decisions about, sustainability as it relates to citizens' personal, work, and community lives.

programs -- such as those sponsored by museums, zoos, nature centers, and 4-H clubs -- so that individuals can make well-informed decisions.

ACTION 2. Media strategists and sustainable development experts should develop an integrated approach for raising public awareness of and support for sustainability goals, conveying information on indicators of sustainable development, and encouraging people to adopt sustainable decision-making in their daily lives.

ACTION 3. A new or expanded national extension network should be developed to provide needed information to enhance the capacity of individuals and communities to exist sustainably.

ACTION 4. Local and state governments should continue to extend their partnerships with community organizations and other levels of government to support community sustainability planning processes and periodic assessments.

ACTION 5. Employers -- in partnership with all levels of government, community organizations, businesses, educational institutions, and others -- should develop training programs to create a workforce with the skills and abilities needed to adapt to changes brought on by the national and global transition to sustainability.

Strengthening Formal and Nonformal Education for Sustainability

A variety of political, technological, academic, and social factors affect the success of any educational undertaking. Many of those factors affecting education for sustainability can be addressed through partnership, perspective, and access.

Local, state, and federal governments; parents, teachers, and schools; environmental organizations; and business associations should form partnerships to coordinate educational programs focusing on sustainable development. Such coordination should reduce duplication of efforts, increase availability of resources, and enhance stakeholders' knowledge and ability to make the decisions that will help their communities thrive.

Sustainability requires that reamers of all ages be prepared for today's ever-changing, increasingly technological society. Computer-based instruction and hands-on experience can foster achievement in technological disciplines and increase employment opportunities. Consequently, in both formal and nonformal educational settings, equitable access to technology must be ensured.

Educating for sustainability requires that reamers have an understanding and appreciation of the international forces that affect their lives. Environmental problems such as air pollution and pollution of the oceans are global in scale since ecosystems and ecological processes do not adhere to human-made boundaries. At the same time, economic and social forces are becoming increasingly globalized. For these reasons, achieving sustainability will require cooperation on an international scale. If today's students are to be ready to make tomorrow's decisions, they must be able to understand the links not only among various subject areas but especially between local and global conditions.

Individuals from diverse backgrounds must have equal access to education for sustainability. Equally as important, their voices must be heard and their input included in the educational process. As the demographics of America's schools and communities change, it is essential that students leam to function in a multicultural society by understanding issues from various perspectives, resolving conflict creatively, and synthesizing new ideas from diverse points of view.

PARTNERSHIP FOR PROTECTION

"There are so many brilliant ideas, but they're like shooting stars because people do not figure out ways to make them sustainable," says Steve Hulbert, owner of on Olympia, Washington, car dealership and a member of the Council's Public Linkage, Dialogue, and Education Task Force. "A sustainable idea must hove support and resources at all levels, otherwise the idea fizzles and fades."

So when Steve Hulbert had a good environmental protection idea, he knew its success would depend on strong partnerships with stakeholders from all walks of life. Olympia's watersheds affect many concems, over the years, however, their viability has been increasingly threatened by human encroachment and activities. He joined with the Global Rivers Environmental Education Network (GREEN) and community members to develop a program that involves youth, businesses, educators, resource professionals, nonprofit organizations, neighborhoods, and government in monitoring the condition of the area's watersheds. The program's goal is to take watersheds from assessment to problem identification to rehabilitation to sustainability.

As part of this program, students from the North Mason School District are working with officials of the State Department of Natural Resources to assess the effects of heavily used recreational trails in the Hood Conal/Tahuya State Forest Watershed. Other partners in the program include the Puget Sound Water Quality Authority, the Washington State Department of Ecology, the Interagency Committee for Outdoor Recreation, the Washington state legislature, the Olympia Department of Natural Resources, and the U.S. Fish and Wildlife Service. These partners supply the resources and financial support while community organizations, businesses, and parents provide the volunteers. Together, they have also estciblished an information network thot allows resources, knowledge, and expertise to be shared.

Steve Hulbert's idea has turned into a full-scale progrom that uses national, state, and local resources not only to educate students about forest ecosystems, the connection between watersheds and the forest, and the effect that humans can have on both, but to empower the whole community to work together to take protective actions.

POLICY RECOMMENDATION 10

STRENGTHENED EDUCATION FOR SUSTAINABILITY *Institute policy changes at the federal, state, and local levels to encourage equitable education for sustainbility; develop, use, and expand access to information technologies in all educational settings; and encourage understanding about how local issues fit into state, national, and international contexts.*	**ACTION 1.** Federal, state, and local governments should form partnerships with private sector organizations, businesses, professional societies, educational institutions, and community groups to develop and implement coordinated strategies supporting education for sustainability. **ACTION 2.** The public and private sectors should support the development of and equitable access to enhanced multimedia telecommunications technologies and improved clearinghouse capabilities that promote an understanding of sustainability. **ACTION 3.** Educators in both formal and nonformal learning programs should help students understand the international factors that affect the nation's transition to a sustainable society. **ACTION 4.** Formal and nonformal education for sustainability invites and involves diverse viewpoints, and that everyone -- regardless of background and origin -- has opportunities to participate in all aspects of the learning process. This will ensure that education for sustainability is enriched by and relevant to all points of view.

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[1] Government Performance and Results Act of 1993, 31 U.S.C. 1115-19 (1995).

[2] U.S. Environmental Protection Agency, *Reinventing Environmental Regulation*, report presented to President Bill Clinton and Vice President Al Gore (Washington, D.C., 1995).

[3] Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11001-50 (1994).

[4] For more information, see Oregon Progress Board, *Oregon Benchmarks: Standards for Measuring Statewide Progress and Institutional Performance*, report to the 1995 legislature (Salem, Oreg., 1994).

[5] Daniel Sitarz, ed., *Agenda 21: The Earth Summit Strategy to Save Our Planet* (Boulder, Colo.: Earth Press, 1993), pp. 266-67. The U.N. Conference proceedings are documented in Group Project by the Youth of Louisville, Kentucky, *We Got the Whole World in Our Hands: A Youth Interpretation of Agenda 21* (Louisville, 1993).

[6] Campus Green Vote, *Blueprint for a Green Campus: The Campus Earth Summit Initiatives for Higher Education*, project of the Heinz Family Fund (Washington, D.C., 1995).

[7] The Roper Organization, *America's Watching, Public Attitudes Toward Television*, poll commissioned by the Network Television Association and the National Association of Broadcasters (New York, 1995), p. 17.

Chapter 4

Strengthening Communities

Creating a better future depends, in part, on the knowledge and involvement of citizens and on a decision-making process that embraces and encourages differing perspectives of those affected by governmental policy. Steps toward a more sustainable future include developing community-driven strategic planning and collaborative regional planning; improving community and building design; decreasing sprawl; and creating strong, diversified local economies while increasing jobs and other economic opportunities.

FLOURISHING COMMUNITIES ARE the foundation of a healthy society. One measure of America's potential for long-term vitality will be the emergence of communities that are attractive, clean, safe, and rich in educational and employment opportunities. Sustainable development can easily remain remote and theoretical unless it is linked to people's day-to-day lives and seen as relevant to fundamental needs such as jobs, clean air and water, and education.

It is often easier to make these connections in the context of communities. It is in communities that people work, play, and feel most connected to society. Problems like congestion, pollution, and crime may seem abstract as national statistics, but they become personal and real at the local level: for example, people are frustrated by long commutes that take time away from family life. It is in communities that people profoundly feel the effects of shifts in the national and regional economy. Although decisions may be justified based on restructuring or other economic needs, workers experience the loss of wages to provide for themselves and their families when factories or military bases are closed. It is within communities that children gain basic education, skills, and training for jobs in the changing marketplace. It is within communities that people can most easily bring diverse interests together, identify and agree on goals for positive change, and organize for responsive action. While the challenges facing the nation are difficult to resolve at any level of government, local communities offer people the greatest opportunity to meet face to face to fashion a shared commitment to a sustainable future.

The role of local communities is becoming increasingly important as the United States, and much of the rest of the world, moves toward more decentralized decisionmaking. The federal government will continue to bear the responsibility for bringing together diverse interests to establish national standards, goals, and priorities. The federal role is important and necessary in areas such as these because national interests may not always be represented in local decisions, and the effects of community choices are felt beyond one municipality. As discussed in chapter

2, "Building a New Framework for a New Century," the federal government is providing greater flexibility and expanding the roles played by states, counties, and local communities in implementing policies and programs to address national goals. This new model of intergovernmental partnership will require information sharing and an unprecedented degree of coordination among levels of government. Local government will play a key role in creating stronger communities from planning and facilitating development, to creating community partnerships, to providing leadership.

It is clear that the scope of a problem determines the level at which it is most appropriately solved. For example, some issues have global, regional, and interregional ramifications. Air pollution is one such issue. The air pollutants in acid rain may originally have been emitted hundreds of miles from where the precipitation ultimately falls. The cooperation of more than one region is required to correct this type of problem.

Sustainable communities are cities and towns that prosper because people work together to produce a high quality of life that they want to sustain and constantly improve. While it is not possible today to point to a list and say, "These communities are sustainable," the emerging ideal of sustainable communities is a goal many are striving to achieve. And while there is no single template for a sustainable community, cities and towns pursuing sustainable development often have characteristics in common. In communities that sustain themselves, all people have access to educational opportunities that prepare them for jobs to support themselves and their families in a dynamic local economy that is prepared to cope with changes in the national and global economy. People are involved in making decisions that affect their lives. Businesses, households, and government make efficient use of land, energy, and other resources, allowing the area to achieve a high quality of life with minimal waste and environmental damage. These communities are healthy and secure, and provide people with clean air to breathe and safe water to drink.

In sustainable communities, people are engaged in building a community together. They are well-informed and actively involved in making community decisions. They make decisions for the long term that benefit future generations as well as themselves. They understand that successful long-term solutions require partnerships and a process that allows for representatives of a community's diverse sectors to be involved in discussions, planning, and decisions that respond directly to unique local needs. They also recognize that some problems cannot be solved within the confines of their community and that working in partnership with others in the region is necessary to deal with them.

In sustainable communities, people use a participatory approach to make conscious decisions about design. The concepts of efficiency and liveability guide these decisions. Development patterns promote accessibility, decrease sprawl, reduce energy costs, and foster the creation of built

environments on a human scale. Use of environmentally superior technologies for transportation, industry, buildings, and agriculture boosts productivity and lowers business costs while dramatically reducing pollution, including solid and hazardous wastes.

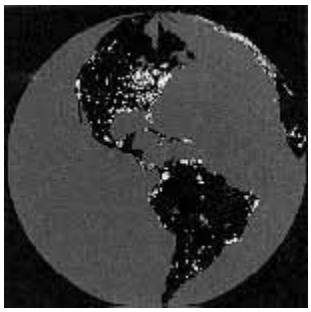
In sustainable communities, partnerships involving business, government, labor, and employees promote economic development and jobs. Participants cooperatively plan and carry out development strategies that create diversified local economies built on unique local advantages and environmentally superior technologies. These efforts can strengthen the local economy, buffering it from the effects of national and international economic trends that result in job losses in a community. Such partnerships also invest in education and training to make community members more productive, raise earning power, and help strengthen and attract business.

Much of what is needed to create more sustainable communities is within reach if people and their community institutions join forces. Many communities are beginning to use sustainable development as a framework for thinking about their future. The big institutions in society--including federal and state governments, businesses, universities, and national organizations--can and should provide support for local community efforts. And in some cases, these institutions need to review the barriers they sometimes inadvertently have erected that diminish the ability of communities to pursue sustainable development.

The Council was inspired by communities throughout the country that are using innovative approaches to reinvigorate public involvement in finding solutions to community problems. From small towns like Pattonsburg, Missouri, to cities like Chattanooga, Tennessee, to large urban centers like Seattle, Washington, many communities are taking responsibility for meeting their economic, environmental, and equity objectives. While none of these communities has been transformed into a utopia, much can be learned from their efforts and progress. By building upon their leadership and innovation, marshaling and reorienting government resources, and creating new standards for process and participation, strengthened communities can provide the foundation for a stronger, revitalized America.

Building A Community Together

The Council believes that one of the best ways to strengthen communities is to ensure that people have greater power over and responsibility for the decisions that shape their communities. Time and time again, community leaders told us that a fundamental component of implementing sustainable development locally is having people come together to identify a community's needs and then work toward collaborative solutions. Accomplishing this requires both political leadership and citizen involvement. They also told us that creating mechanisms for communities to work together cooperatively is necessary to deal with problems that cross political jurisdictions.



The capacity of democratic institutions to solve problems and create a better future depends on the knowledge and involvement of citizens in a community decision-making process that encourages systemic thought and broad-based action. Systemic thought is required so that economic, environmental, and social problems are recognized as integrated and actions to address them are coordinated. Because these problems are interconnected in daily life, approaching them one at a time does not work. In fact, such a strategy is often counterproductive, leading to short-term fixes and long-term difficulties--a situation society can ill afford. The integration of local decisionmaking offers a way to improve the economy, the environment, and social equity in communities.

Broad-based action is needed because local government alone cannot accomplish long-term solutions to community problems. Nor can individuals, businesses, community groups, or state and federal agencies do so by working in isolation. Lasting solutions are best identified when people from throughout a community--as individuals; elected officials; or members of the business community, environmental groups, or civic organizations--are brought together in a spirit of cooperation to identify solutions to community problems.

But make no mistake: this work is difficult, and there are barriers to its success. The time and energy of many families are already drained by juggling the demands of the workplace and the home. Cynicism toward government is high, and. all too frequently. Participation in civic life is declining.

Despite the obstacles, some communities are succeeding in ambitious efforts to involve citizens in building a stronger community. For example:

- Since 1984, more than 2,000 Chattanooga residents have worked together to identify broad goals to lay out a vision for their city's future.
- In Pattonsburg, which was nearly destroyed by a flood in 1993, residents came together and, with the assistance of experts on sustainable design, decided to rebuild their community on higher ground.
- In Seattle, a local citizens' group spearheaded an effort to measure the progress or decline of key social, economic, and environmental indicators that were identified by the community as priorities.
- Metropolitan areas like Portland, Oregon, and states like Minnesota have begun to use broad-based goal-setting and benchmarking projects in planning their collective future and measuring their progress.

By listening to the stories of communities throughout the country, the Council learned that there are fundamental steps to a community-driven strategic planning process. A critical first step is to assemble a broad cross section of the community to participate in an open, public process.

Through a series of meetings and events, the community develops a vision for its future. It then conducts an inventory and assessment of its economic, natural, and human resources. Specific economic, environmental, and social goals are determined; these build on the community's vision, resources, and needs. Next, the community sets priorities for its goals, identifies specific actions, and establishes indicators or benchmarks to measure progress toward the goals. If successful, the strategic planning process results in a clear sense of direction and timing. It specifies the actions and responsibilities to be undertaken by business, residents, government, and community groups.

Fundamental to the long-term success of community-driven solutions is the opportunity for all residents to participate, including people who have been historically underrepresented in decisionmaking. While citizen participation is primarily an individual decision, government and the private sector can encourage people to be more involved by addressing barriers to participation. By developing a strategic plan that involves the diverse sectors of the community and generates leadership to bring about specific actions, communities have taken steps to create a better future for their residents.

Cooperation among communities in a metropolitan area is also necessary. For some time, there has been a trend toward increased concentration of the U.S. population in metropolitan areas. This trend is linked both to population growth and people's migratory patterns. The number of Americans living in metropolitan areas rose from 140 million in 1970 to more than 203 million in 1992.[1] This trend affects such concerns as congestion, urban pollution, and high demand for public space and services, which together lower the quality of life in cities and contribute to the exodus from central cities that is occurring in many parts of America. By working together, communities can tackle issues--like transportation planning--that affect, and whose resolution can benefit, an entire region. This collaborative approach is not only an opportunity, it is a necessity. Community leaders who met with the Council emphasized that without regional approaches to solve many critical problems that affect communities--such as economic development, transportation, land use, sprawl, and water quality--little long-term progress can be made.

By creating incentives to encourage communities to work together, state and federal governments can improve the decision-making process and promote long-term, holistic solutions to regional problems. Building stronger links among people, communities, and the decisions that affect them can revitalize grassroots democracy and thereby strengthen communities, regions, and the nation. The actions listed below need additional commitments of time and resources, but we as a Council believe they are necessary and worthwhile.

CHATTANOOGA: A CITY REMAKING ITSELF

Chattanooga's story of the last 30 years is not unusual. Suburban sprawl beginning after World War II drained the downtown area of much of its retail and almost oil of its residential development. The economic base collapsed as traditional manufacturing jobs moved elsewhere; and many local companies laid off workers, were sold to outside interests, or closed down. Racial conflicts, poor schools, and an eroding infrastructure all signaled urban decline. Further manifestation of this decline came in 1969, when Chattanooga was dubbed the "worst polluted city" in America.

The second part of the Chattanooga story is all too rare among American cities. In recent years, concerted efforts by government, business, community organizations, and citizens have resulted not only in cleaner air but also in a willingness to undertake bold initiatives conceived within a shared vision, integrating Chattanooga's economic, environmental, and social aspirations. During the Council's January 1995 visit to Chattanooga, community leaders shared lessons learned in their quest to become an "environmental city," where everyone works together to generate a strong economic base, nurture social institutions, and enhance the natural and human-made landscape.

Today, public-private partnerships are the norm in Chattanooga. Collaborative efforts have generated the capital resources, political commitment, and civic momentum to tackle such complex problems as affordable housing; public education; transportation alternatives; urban design; air and water pollution; recycling; job training; human relations; downtown and riverfront development, neighborhood revitalization; and conservation of natural areas, parks, and greenways. Community involvement in the planning of these efforts has been a key factor in the efforts'success.

Since 1984, in a series of planning projects, the city has invited all members of the community to envision what they want for the future. This process has paid off handsomely. In 1990, when the U.S. Environmental Protection Agency recognized Chattanooga for meeting its clean air requirements, the city was designated on Earth Day as the notion's best environmental turnaround story. An article in Sports Illustrated described Chattanooga as "not a miracle, but a nuts-and-bolts model of how tough government, cooperative businessmen, and a verv alarmed public can make a dirty world clean again."

Chattanooga today sees itself as a living laboratory where ideas can be explored, leaming is ongoing, and both people and nature can prosper. The Chattanooga story is not finished: it is

only just beginning. As a new city slogan says, "It takes oil of us ... It takes forever."

POLICY RECOMMENDATION 1

COMMUNITY-DRIVEN STRATEGIC PLANNING

Create a community-driven, strategic planning process that brings people together to identity , key issues, develop a vision, set goals and benchmarks, and determine actions to improve their community.

ACTION 1. All levels of government and the private sector should build multisector decision-making capacity at the local level. They can do so by providing information and financial and technical assistance to communities that wish to engage in a collaborative, communitywide process to integrate economic prosperity, environmental health, and opportunity in their decisions and actions.

ACTION 2. All levels of government should ensure substantial opportunity for public participation in all phases of planning and decisionmaking to allow those affected to have a voice in the outcome. Specific steps include creating and expanding methods for public participation in legislation, ordinances, and community advisory boards. Special steps should be taken to ensure that historically underrepresented groups are involved.

ACTION 3. All levels of government, especially local government, should identify barriers to greater citizen involvement in decisionmaking -- such as lack of child care or transportation -- and develop strategies to overcome them. Employers should give employees flexibility and incentives to increase the time they and their families can devote to community activities.

ACTION 4. Community-based coalitions can create educational media campaigns to encourage citizen participation in government, disseminate high-quality information on community issues, and promote public discussions that identify solutions to problems. Coalitions should be as broad as possible, including industry and business, schools, newspapers, television and radio stations, community groups, environmental organizations, labor, and local government.

ACTION 5. Federal and state agencies should help local communities that wish to use profiles of potential environmental risks as a tool to identify and set priorities for solving environmental problems. The agencies should provide information on and facilitate access to communities that have successfully used this tool.

ACTION 6. Community-based coalitions can work together to draft an economic development strategy to fill basic needs and take advantage of new trends as part of the strategic planning process. Coalitions should include businesses, employees, unions, chambers of commerce, environmental organizations. local government, and residents.

ACTION 7. Community-based coalitions can develop and carry out programs to increase voter registration and participation, working with national voter registration projects where possible.

POLICY RECOMMENDATION 2

COLLABORATIVE REGIONAL PLANNING

Encourage communities in a region to work together to deal with issues that transcend jurisdictional and other boundaries.

ACTION 1. States, counties, and communities should cooperate to create a system of regional accounts that measures the costs and benefits of local land use, development, and economic trends on a region's economy, environment, distribution of benefits, and quality of life. States and regions can consider the use of collaborative benchmarking, such as those used in Oregon and Minnesota, to look at a broad range of social, environmental, and economic measures. The federal government should work with state and local governments to ensure that federal statistical resources are available and used appropriately to support state and local governments in measuring benefits and costs.

ACTION 2. Federal and state governments should encourage cooperation among communities by providing incentives fo regional collaboration on issues, such as transportation, affordable housing, economic development, air and water quality, and land use, that transcend political jurisdictions.

In encouraging such cooperation, they should look to the example of the federal Empowerment Zone/Enterprise Community Program, which required communities to draft funding proposals using a collaborative strategic planning process. [2] This kind of cooperation should be encouraged among communities within a region to advance common objectives. Federal and state agencies responsible for environmental protection, economic development, land use, and transportation policies should work with one or more geographic areas to establish planning and development activities. These agencies should create incentives to encourage regional planning and development, such as waivers of state matches for transportation planning funds and more favorable federal and state tax treatment for site cleanup costs.

ACTION 3. Local and county governments can pool resources from

local property taxes to increase equity in public services, improve the quality of education, break the exacerbating regional mismatch between social needs and tax resources, reduce local fiscal incentives for sprawl, and end competition for the tax base within a metropolitan area. Local and county actions to accomplish this should receive federal and state incentives.

Designing Sustainable Communities

Society's investments should aim to create places that people want and can sustain The built environment is a critical factor in shaping the quality of life, accessibility, environmental burden, and unique character of a community, which contributes to a sense of place. The ways in which homes are designed and constructed, commercial buildings erected, roads and sewers laid, whole neighborhoods and communities planned and built, and open space allocated and preserved are all fundamental to creating a community that is sustainable. Design and architecture also play an important role in facilitating or discouraging human interaction. Communities built with sidewalks, town history, and culture.

Sustainable building design and community planning make efficient use of existing infrastructure, energy, water, materials, and land. Not only does such use save money, it also safeguards public health and the environment and conserves natural resources. Building codes can shape how much energy, water, and materials a building consumes in its construction and operation. Zoning ordinances frequently influence decisions on the construction, design, and siting of buildings and developments. Efficient land use protects vulnerable environmental areas that provide important benefits to society. For example, coastal areas, watersheds, and floodplains absorb the forces unleashed by nature. And preserved wetlands can filter water far more cheaply than expensive water treatment facilities.[3] In contrast, development in these areas exposes people and their investments to unnecessary risks and natural hazards.

Location efficiency is another important component of sustainable design. Zoning ordinances that allow for mixed-use development, such as having a store, apartment building, and school on the same block, can give people easy access to a range of facilities and the ability to walk to obtain goods and services. This can result in decreased reliance on motorized vehicles, thereby reducing congestion and air pollution.

Sustainable community design is based on an understanding of the powerful effect of the built environment on aesthetics, scale, and a sense of history and culture. Historic buildings give society an important sense of tradition and education about the past. Preservation of existing

structures also offers a way to reuse and recycle materials and related infrastructure. By rehabilitating older buildings, communities can save energy and materials and establish a sense of continuity.

Localities have used zoning and other ordinances to foster historical connections. For example, the bay windows contributing to the beauty and character of Boston's Back Bay were the result of a zoning code that allowed one-third of each building to extend to the street. Charleston, South Carolina, and Savannah, Georgia, among many other historic areas, have protected their architectural heritage -- and enhanced their property values -- by using design control measures and by making historic preservation a priority.

Some communities are working together to create regional strategies for transportation, land use, and economic growth. For example, in the Portland, Oregon, metropolitan area, communities are working together to plan for the explosive population growth the area has experienced since the 1980s. By using coordinated decisionmaking and establishing an urban growth boundary, which contains future growth, these communities are conserving open space and prime farmland to preserve the quality of life that has attracted so many people to Portland in the first place. They are also using community impact analyses to inform themselves about proposed development during the planning phase when adjustments can be made more easily.

Design that is coordinated among communities can help address issues related to growth. While some growth is necessary, it is the nature of that growth that makes the difference. Sprawl typically is development situated without regard to the overall design of a community or region. It often results in types of development -- such as rambling, cookie-cutter subdivisions and strip malls -- that perpetuate homogeneity, make inefficient use of land, and rely almost exclusively on automobiles for transportation. Sprawl development provides immediate and direct benefits to the people who move there, but the costs are longer term and borne by society at large. This is a "tragedy of the commons" in which individuals acting logically in their own interest harm a

common resource. Sprawl is caused by a combination of incentives established by governmental policies and individual decisions made in response to a complex array of factors. This combination results in urban decline and is made worse by competition among local jurisdictions with little regional cooperation.

The brownfields issue is an example of the need for regional strategies. Brownfields are abandoned, contaminated, and/or underused land that is often found in the inner city. In contrast, greenfields are relatively pristine, undeveloped land, usually found at the edge of a metropolitan area or in a rural area. A company deciding whether to invest in building or modernizing a plant in a city center or building on rural or suburban open space weighs many factors. What is the cost of development? How much time will it take? What are the uncertainties? What are the operational costs? What is the proximity to the market or the workforce? Answers to these questions depend on a number of factors, such as labor skills and public safety concerns. The economic opportunities presented by brownfield redevelopment are discussed later in this chapter; but the issue of brownfields is clearly linked to sprawl, land use, and regional design as well.

Land use and infrastructure policies have a significant impact on development decisions. If the cost of cleaning up brownfields is borne by the developer but the cost of roads and utilities needed to serve greenfield development is borne by government, the scales tip. If the uncertainty of time and liability associated with brownfield development is greater, the scales can tip further. And if the tax burden in a newer, more affluent suburb is less than in the urban center, the case for greenfield development could be substantial. While it is a private decision made by individuals and businesses, it is greatly influenced by governmental policies that are not always readily apparent.

Benefits of developing open space are experienced one house or one business at a time. These benefits are tangible and immediate. The costs are harder to measure. In contemplating open land for residential or industrial development, an awareness and appreciation of what might be lost and of the environmental costs should be taken into account. Visionary planner Frederick Law Olmsted described urban parks as the lungs of a city.[4] This concept also applies to rural regions. Forests, farmland, mountains, plains, deserts, and swamps give the nation vital breathing room. New development should be based upon the carrying capacity of a region, which is the environment's finite ability to support life and renew itself.

Given the importance of the physical design of communities and their infrastructure, it is essential that communities continue to work cooperatively to understand and evaluate the potential long-term consequences of decisions made and to adapt them for their long-term well-

being. State and federal governments should work collaboratively with communities to devise ways to measure these consequences in order to help local governments make their decisions.

Design, by definition, involves planning and making deliberate decisions. This occurs at different scales in the context of a community. The following recommendations are organized along these scales of design. The first scale relates to the design of buildings and other structures within the community. The second relates to the physical layout of streets, transit, residences, stores, and workplaces in the community. The third ties the community to others in the region.

POLICY RECOMMENDATION 3

BUILDING DESIGN AND REHABILITATION

Design and rehabilitate buildings to lise energy and natural resources efficiently, enhance public health and the environment, preserve historic and natural settings, and contribute to a sense of community identity.

ACTION 1. Federal, state, and local governments should work with builders, architects, developers, contractors, materials producers, manufacturers, community groups, and others to develop and enhance design tools that can be used to improve the efficiency and liveability of buildings. These include models for building codes; zoning ordinances; and permit approval processes for residential and commercial buildings, public infrastructure, and landscapes. Model building codes should consider energy efficiency; durability; use of nontoxic materials; indoor air quality; use of recycled and recyclable materials; use of native plants that can reduce the need for fertilizers, pesticides, and water for landscaping; and use of designs that promote human interaction.

ACTION 2. These groups should disseminate these design tools, making the information easily accessible to local decisionmakers in interested communities which can use the model codes as a starting point, adapting them to reflect local conditions and values.

ACTION 3. Groups in communities that have made historic preservation a priority can inventory and prioritize historic properties and identify financing to rehabilitate these buildings. Local governments can enact ordinances to preserve historic buildings and remove incentives that encourage demolishing them. They can create incentives for rehabilitating and adapting historic buildings for new uses, where appropriate.

NOURISHING COMMUNITIES: JORDAN COMMONS

When Hurricane Andrew blew through Homestead, Florida, on August 24, 1992 it left in its wake $2 billion in damages and an immeasurable emotional toll on the rural and agricultural community. About 100,000 homes were severely damaged or destroyed, induding more than 1,600 units of public housing. Today, the tent villages ore gone and many homes have been rebuilt. Yet for thousands of low-income families, life has not retumed to normal. With a continued lack of affordable housing, they still feel the effects of the storm in the most fundamental way. Homestead Habitat for Humanity, a nonprofit ecumenical Christian organization whose mission is to encourage private homeownership for low-income families, hopes to alleviate some of the shortage through Jordan Commons, a pilot project in community building.[5]

Jordan Commons will provide 187 single-family homes built with government support, $15 million in private donations, and the sweat equity of individual volunteers and future homeowners working side by side. As in all Habitat projects, homeowners will reflect the ethnic and racial composition of their community. At Jordan Commons, approximately 40 percent of the owners will be African-American, 40 percent Latino, and 20 percent white. Moreover, in addition to providing quality housing, the Jordan Commons project aims to tackle a much larger challenge. It hopes to use new principles in design and community planning to build a thriving neighborhood.

Eliza Perry, Homestead city councilwoman and Habitat board chair, describes some of the neighborhood's planned features. "The streets are designed for people. The roads will be narrow an the tree-shaded sidewalks wide. All homes will have front porches. Three small parks will allow children to play near their homes. The town center will draw homeowners out onto their sidewalks. This focal point of the community will house a 10,000-square-foot recreation center. Additional community buildings will hold a day-care center, a food co-op, continuing education programs, and an after-school program, all aimed at supporting fomilies and encouraging social interaction."

Jordan Commons also plans to design environmentally sound homes. Scientists from Florida

lnternational University and the Florida Solar Energy Center have developed a list of energy-efficient approaches for building homes. With these innovations, the new homes are expected to be 38 to 48 percent more energy efficient than most homes of comparable size. Water heating will be supplied primarily through solar systems, and water will be recaptured and, after treatment, returned to the groundwater system. Alternative transportation will be encouraged through bike paths and racks, as well as a shaded bus stop station along nearby U.S. Route 1.

Underlying the thoughtful planning and family-friendly design is one central goal: citizen participation. As Dorothy Adair, Homestead Habitat president, states, "Simply building a community hall or neighborhood park does not necesscirily create or encourage community. It is the common identity, public concern, and ultimately the collective action of residents that truly sustains and nourishes an evolving community. The facilities and services of Jordan Commons have been designed to engender such elements. and this is the true message of the lordan Commons model."

POLICY RECOMMENDATION 4

COMMUNITY DESIGN

Design new communities and improve existing ones to use land efficiently, promote mixed-use and mixed-income development, retain public open space, and provide diverse transportation options.

ACTION 1. Local jurisdiction should structure or revise local zoning regulations and permit approved processes to encourage development located along ransit corridors, near a range of transit alternatives, and in rehabilitated brownfield sites, where appropriate. Where there is demand for it, zoning should allow mixed-use development siting including residences, businesses, recreational facilities, and households with a variety of incomes within close proximity.

ACTION 2. Federal and state governments and the private sector should offer the assistance of multidisciplinary design teams to local jurisdictions that want help with sustainable community design. These design teams should include leading experts in a broad range of fields, including architecture, transportation, land use, energy efficiency, development, and engineering. Design teams should work with state and local governments and community residents with related experience to design, develop, and make accessible to communities alternatives to sprawl development, models for regional

cooperation, and sustainable building practices.

ACTION 3. The federal government should work with lenders to expand research on location-efficient mortgages. Such a mortgage would increase the borrowing power of potential homebuyers in high-density locations with easy access to mass transportation. A borrower would quality for a larger loan based on expected higher disposable income from a reduction in or absence of automobile payments, insurance, and maintenance.

ACTION 4. Federal and state governments -- in consultation with local government, the private sector, and nongovernmental organizations -- should support local planning that integrates economic development, land use, and social equity concerns and engages significant public participation through existing planning grants. These principles, which were integrated in the Intermodal Surface Transportation Efficiency Act, should be reaffirmed during the act's reauthorization and expanded as requirements for federal and state funding and tax incentives for economic development, housing, transportation, and environmental programs.[6]

ACTION 6. The federal government should give communities credit toward attainment of national ambient air quality standards under the Clean Air Act when they use community design to lower traffic by adopting zoning codes, building codes, and other changes that encourage more efficient land use patterns to reduce pollution from motor vehicles and energy use.

ACTION 7. All levels of government should work with community groups and the private sector to ensure that no segment of society bears a disproportionate share of environmental risks in a community. Collaborative partnerships could periodically conduct evaluations to ensure that desirable transportation and infrastructure investments -- such as those in roads, buildings, and water projects -- do not disproportionately deliver greater benefits to wealthier, more politically active communities and disproportionately fewer benefits

to poorer, less politically active communities or communities of color.

PATTONSBURG: A TOWN RENEWAL

In Pattonsburg, Missouri, a small community of 250 that was nearly destroyed by the Midwest floods of 1993, a federally supported design team is working with residents to move the town -- literally -- to higher ground.

The community seized this opportunity to incorporate concepts and technologies for sustainability at oil levels of their relocation scheme, from the physical structure of the new town to economic strategies for redevelopment.

Pattonsburg adopted a Charter of Sustainability -- a set of principles to guide the town's development -- as well as building codes to ensure energy and resource efficiency while preserving the community's character. It also created a privately funded Sustainable Economic Development Council to spearhead the expansion of environmentally responsible industry in the town.

Plans for the new town include use of the latest environmentally sensitive technology and eco-efficient design to meet the community's social and physical needs. The street layout is designed to be pedestrian-oriented and to maximize southern exposure to each home, giving residents the best opportunity to use passive solar heating to lower energy needs. A system of artificial wetlands will use the natural contours of the land to capture and treat polluted urban runoff, thereby saving money on sewer construction. A methane recovery system will help nearby swine forms convert an odor and pollution problem into energy.

Pattonsburg is an example of collaboration among loccil, county, state, and federal governments. It is also a noteworthy public-private sector partnership. Most importantly, it is grounded in broad-based community involvement and support. It shows how a rural community can turn tragedy into an extraordinary opportunity to shape a sustainable future.

POLICY RECOMMENDATION 5

COMMUNITY GROWTH MANAGEMENT

Manage the geographical growth of existing communities and siting of new ones to decrease sprawl, conserve open space, respect nature's carrying capacity, and provide protection from natural hazards.

ACTION 1. States and communities should evaluate the costs of infrastructure in greenfield or relatively undeveloped areas to examine subsidies and correct market incentives in the financing of capital costs of infrastructure, such as sewers and utilities, for development of land bordering metropolitan areas.

ACTION 2. All levels of government and nongovernmental organizations can conserve open space through acquisition of land and/or development rights. For example, public water departments can budget to acquire land necessary to protect public water supplies. Private land trusts can expand their acquisition of wetlands or other valuable open space.

ACTION 3. Local governments and counties can create community partnerships to develop regional open space networks and urban growth boundaries as part of a regional framework to discourage sprawl development that threatens a region's environmental caffying capacity.

ACTION 4. Local governments and counties can work together to use community impact analyses and other information on the environmental carrying capacity of a region as the foundation for land use planning and development decisions.

ACTION 5. All levels of government should identify and eliminate governmental incentives, such as subsidized floodplain insurance and subsidized utilities, that encourage development in areas vulnerable to natural hazards.

ACTION 6. The federal government should redirect federal policies that encourage low-density sprawl to foster investment in existing communities. It should encourage shifts in transportation spending toward transit, highway maintenance and repair, and expansion of transit options rather than new highway or beltway construction.

CALIFORNIA SPRAWL

Unchecked development accompanied growth and prosperity in California over the past three decades. Today, along with many states and communities across the country, California must deal with the consequences of that kind of post growth - chief among them, the problem of sprawl. "As we approach the 21st century, it is clear that sprawl has created enormous costs that California can no longer afford," says the 1995 report Beyond Sprawl: New Patterns of Growth to Fit the New California. "Ironically, unchecked sprawl has shifted from an engine of Califomia's growth to a force that now threatens to inhibit growth and degrade the quality of our life."

Sprawl takes its toll on society as well as on the landscape. The report identifies a variety of consequences. There is a dramatic increase in automobiles and time spent in traffic jams. Irreplaceable prime agricultural land and forest land are lost. Taxes and other costs for individuals and businesses increase to provide new infrastructure. Sprawl frequently widens the distance between where people live and work. It also results in abandonment of investments in older communities, which continue to suffer long-term decline.

This appraisal comes from a joint study undertaken by the Bank of America, Colifornia's Resources Agency, the Greenbelt Alliance, and the Low Income Housing Fund. It makes a compelling argument for reorienting growth to create more compact, efficient communities. The net effect would be to improve the business climate, conserve agricultural land and natural areas, and revitalize cities. Beyond Sprawl sheds light on problems faced by communities not only in California, but in the Rust Belt and the Sun Belt, in the Midwest, Southwest, and Northwest.

"This is not a call for limiting growth, but a call for California to be smarter about how it grows -- to invent ways we can create compact and efficient growth patterns that are responsive to the needs of people at all income levels, and also help maintain California's quality of life and economic competitiveness," says the report. Community action, public policy, private business practice, and individual effort will all be necessary to attain this objective. The report also recommends multi-stakeholder collaborative efforts to create a constituency to build sustainable communities.

Promoting Economic Development and Jobs

Sustainable development is premised on improving how society meets human needs for all people in a manner consistent with protecting the natural environment. A strong local economy is at the core of a sustainable community because economic development and the jobs it creates are the vehicles for meeting human needs. Before anything else, people must be able to provide for the basic necessities of food and shelter for themselves and their families.

The economy of the nation as a whole depends significantly on the success of its many interconnected local and regional economies. In recent years, dramatic changes in the global economy have resulted in major shifts in local economies as both national and local markets adjusted to the trends. In some cases, the nation became more competitive. In the process, however, many local economies lost jobs and/or income; for some, the future of their communities was endangered. Government has, in some cases, an obligation to address the human consequences of policy decisions on environmental, trade, or defense issues that result in job losses in a community. For example, economic assistance and retraining for new business opportunities have been provided to fishermen whose income has been drastically reduced because of unsustainable harvesting that necessitated strict conservation measures. Assistance has also been given to communities where military bases have closed, or that have been adversely affected by trade agreements. These situations can be seen as opportunities to direct government aid to help communities take advantage of new kinds of economic development.

Strategies to create strong, diversified local economies are needed to weather -- and even take advantage of -- fundamental shifts in national and international economies. The communities that prosper will be those that develop strategies to create resilient local economies that make the unique strengths of their people and their place a source of competitive advantage. Local economic development proposals should fill a niche in the regional economy. Local economic health is often strengthened by partnerships among the private sector, employees, educators, and government. These efforts can create an environment that promotes entrepreneurship, innovation, and small business growth to marshal resources within the community to fill local economic needs.

Given that perhaps the only natural resource that can be considered unlimited is human intellectual capacity, training and lifelong learning are essential if sustainable communities are to develop a flexible, well-educated workforce, a subject explored further in chapter 3, "Information and Education." Education and training are arguably the most valuable pieces of any economic development strategy because they are the only way to build the intellectual capacity necessary for a trainable and employable workforce. This capacity, in turn, allows a community to adapt to the fundamental shifts in national and international economies that will

continue in the years ahead. Partnerships that involve employers, unions, educators, and workers are key to ensuring that employees can take advantage of the opportunities offered by emerging industries.

A key part of a local economic development strategy is encouraging businesses and industries that are at the forefront of environmental economic development opportunities. Environmental technologies promise both cleaner traditional industries and an important opportunity for creating jobs for the future based on cleaner and more efficient technologies. Strategies include investments in resource efficiency to improve the profitability of small businesses, using the solid waste stream to develop community-based recycling businesses, supporting eco-industrial parks, and targeting the benefits of increased efficiency to create economic opportunity and social equity. A systems approach to communitywide economic development promotes maximum resource and energy efficiency of businesses, the community, and the region. Economic growth is achieved and human needs are met with improved efficiency and environmental performance. Pursuing such concepts requires imagination and effort. Initially, extra resources may be called for, but the rewards can be significant.

The creation of an eco-industrial park is an example of a new form of development that pays both economic and environmental dividends. Eco-industrial parks are an environmentally efficient version of industrial parks. They follow a systems design in which one facility's waste becomes another facility's feed- stock, and they ensure that raw materials are recycled or disposed of efficiently and safely.

Increased efficiency in resource use provides an opportunity to target some of the benefits from innovation to produce jobs and social equity. The benefits and avoided costs that will accrue to society from more efficient use of existing resources can provide the basis for an economic expansion that will increase economic prosperity for all. By preventing pollution, reusing and recycling materials, and conserving energy, new technologies can increase profits, protect and create jobs, and reduce threats to the environment.

There will also be opportunities to target the benefits from regulatory flexibility to encourage social equity and economic development. An example is a cash-for-clunkers program in which companies that own stationary sources of air pollution can purchase and scrap older, more polluting cars rather than make expensive investments in pollution control in their facilities.[7] Such a program benefits industry by allowing a more cost-effective method for reducing air emissions and benefits the environment by removing some higher polluting cars from the road. This program could provide further social benefit if some of the economic savings were targeted

to provide training and jobs to low-income workers to repair older vehicles to meet air quality requirements.

Urban communities around the country are also working to redevelop brownfield sites to improve public health and the economic competitiveness of these sites and surrounding neighborhoods. Cleveland, Ohio, Detroit, Michigan, and Chicago, Illinois, are examples of cities that are cleaning up brownfield sites as a strategy for revitalizing their local economies. By targeting economic development in otherwise wasted brownfield areas, these cities are hoping to create jobs, generate tax revenue, and improve the environmental quality of the inner city. They are working to identify and eliminate barriers to redeveloping brownfield sites and to create partnerships among city, state, and federal environmental agencies, residents, local businesses, and lenders. They are also using incentives to attract and retain business activity. Closely tied to issues of sprawl, brownfield sites are often not competitive with greenfield sites -- undeveloped suburban or rural areas -- because the true costs of development are not clear. For example, developers often do not consider the infrastructure costs of undeveloped areas, such as the cost of sewers, roads, and electrical lines that need to be built to support the growth.

POLICY RECOMMENDATION 6

CREATION OF STRONG, DIVERSIFIED LOCAL ECONOMIES

Apply economic development strategies that create diversified local economies built on unique local advantages to tap expanding markets and technological innovation.

ACTION 1. As part of a broader community-driven strategic plan, a community can conduct an inventory and assessment of its economic, natural, and human resources to identify its unique comparative advantages and strategic niche in the larger regional economy.

ACTION 2. State and federal governments should promote labor force development when they fund physical infrastructure projects for transportation, public housing, and sewer and water systems within a community by hiring locally and providing skills training for workers.

ACTION 3. Federal, state, and local governments should assist low-income workers through programs to improve access to education and training and tax and development strategies targeted at the creation of jobs in new markets integrating economic and environmental goals.

ACTION 4. Federal and state governments should review and where appropriate, strengthen labor standards by ensuring an adequate minimum wage and proper health and safety standards and by encouraging greater flexibility in work hours to allow more time for community participation and/or parenting.

POLICY RECOMMENDATION 7

TRAINING AND LIFELONG LEARNING

Expand and coordinate public and private training programs to enable all people to improve their skills to match future job requirements in communities on a continuing basis.

ACTION 1. Businesses, unions, schools, students, and local government within a community should develop and integrate training programs to ensure that workers -- especially those who need it most -- have the necessary skills to take advantage of current and future economic development opportunities. They should work together to integrate current programs and acquire funding from the private sector, schools, and government to fill identified gaps. Training programs that should be integrated and potentially expanded include school-to-work arrangements, apprenticeships, community service, summer employment, and job corps opportunities.

ACTION 2. Federal and state governments should help those who want to pursue further education and lifelong leaming by providing individuals with tax deductions for tuition, assistance with financing, or other incentives.

POLICY RECOMMENDATION 8

ENVIRONMENTAL ECONOMIC DEVELOPMENT

Capitalize upon economic development opportunities from businesses and industries that target environmental technologies, recycling, and pollution prevention to create jobs.

ACTION 1. Federal and state agencies should work with the private sector to create a one-stop shop for financial and technical assistance to small businesses that would identify cost-effective investments in resource efficiency and financing and help make pollution prevention standard practice. The federal government should work with lenders to develop ways to validate the outcomes of investments in resource efficiency to address their concerns and so improve access to capital.

ACTION 2. Federal and state agencies should assist communities that want to create eco-industrial parks that cluster businesses in the same area to create new models of industrial efficiency, cooperation, and environmental responsibility. Assistance should include making relevant information available, allowing flexibility in permitting and other regulator areas while ensuring that environmental goals are met or exceeded, and enacting mixed-use zoning that allows for eco-industrial parks that have low or no emissions.

ACTION 3. Local communities can adopt programs to reuse materials and collect and recycle secondary materials diverted from what some call the urban mine - the municipal solid waste stream. Such programs minimize wastes, prevent pollution, provide opportunities for new businesses and industries such as recycling-related manufacturing, generate jobs and revenue from recycling collection and processing, create high-skill industrial jobs and sizeable sales revenues from manufacture of recycled products, and conserve landfill space. The federal government should work with state and local governments to establish related guidelines and model programs and create incentives to promote secondary materials use and recycling-related manufacturing.

ACTION 4. The public, private, and nonprofit sectors should work together to identify innovative opportunities to target some of the economic benefits from more efficient use of resources and greater regulatory flexibility in terms of creating jobs, opportunity, and social equity in communities.

CREATING CLEAN JOBS

Clean Cities Recycling, Inc. (CCR), is a nonprofit community development corporation formed as a joint venture involving 2-Ladies Recycling, Inc., of Hobart, Indiana; the Gary Clean City Coalition, a community-based environmental organization, and Brothers Keeper of Gary, a shelter for homeless men. CCR's stated mission is 'to benefit the public interest and lessen the burden on government by creating permanent employment by utilizing the economic opportunities available through the processing and marketing of residential recyclables."
The joint venture was formed in 1993 to compete for a two-year contract awarded by the Lake County Solid Waste Management District to set up and operate 25 drop-off recycling centers. The district and its board were established in 1991, when Indiana set a goal of reducing trash to landfills by 35 percent by 1996 and 50 percent by the year 2001.

To date, the firm has set up 10 drop-off centers at grocery stores, The sites are open Monday through Saturday, 8 a.m. to 8 p.m., and are serviced daily. They collect clean, source-separated household recyclables: glass, aluminum, steel cons, newspaper, cardboard, and some plastics. Materials are sold to local markets and established scrap dealers in the Greater Chicago area. Fiber is purchased by a paper mill in Lake County, glass is bought by a company just over the county line in Illinois, and steel returns to the steel mills.

Clean Cities Recycling now employs six full-time and two part-time workers who are paid $6.50 to $10.00 an hour. It provides job training, work experience, and letters of recommendation to homeless shelter residents, who are paid a stipend for their work. The venture also helps provide continuing financial support for Brothers Keeper. Benefits from the business flow to the city of Gary and surrounding communities.

POLICY RECOMMENDATION 9

REDEVELOPMENT OF BROWNFIELD SITES *Revitalize brownflelds -- which are contaminated, abandoned, or underused land -- by making them more attractive for redevelopment by providing regulatory flexibility, reducing process barriers, and assessing greenfleld development to reflect necessary infrastructure costs.*	**ACTION 1.** All levels of government should work in partnership with community residents, environmental organizations, community development corporations, industry, and businesses to redevelop or stabilize brownfield sites by eliminating barriers and creating incentives for environmental cleanup and by reorienting existing state and federal economic development funding and programs to include these sites. **ACTION 2.** Federal and state agencies should encourage investment in brownfield redevelopment by using the polluter pays principle, assuring prospective purchasers and lenders that they will not be held liable for cleanup in cases in which they did not contribute to contamination. **ACTION 3.** The federal government should work with states, counties, and communities to develop tools that compare, on a site-specific basis, the local economic and environmental costs of developing a greenfield versus redeveloping a brownfield site.

[1] U.S. Department of Commerce, (Washington, D.C.: Government Printing Office, 1994), p. 97, table 39.

[2] Omnibus Budget Reconciliation Act of 1993, Pub. L. 103-66, 107 Stat. 312. Under this statute, businesses and employers of the nine empowerment zones are eligible for three major tax benefits, including employer wage credits, increased Section 179 spending, and tax-exempt bond financing for qualified properties.

[3] U.S. Environmental Protection Agency, Wetlands Fact Sheet #4: Economic Benefits of Wetlands (Washington, D.C., 1993), p.1.

[4] Frederick Law Olmstead, Jr., and Theodora Kimball, eds., Forty Years of Landscape Architecture: Central Park (Cambridge: MIT Press, 1973), p. 45. The passage is from a report Frederick Law Olmsted, Sr., submitted to the Department of Public Parks in 1872.

[5] For more information, see Homestead Habitat for Humanity, Concept and Background, Jordan Commons: A Pilot Program for Sustainable Community-Building (Homestead, Fla., 1995).

[6] Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. 102-240, 105 Stat. 1914.

[7] U.S. Congress, Office of Technology Assessment, Retiring Old Cars: Programs to Save Gasoline and Reduce Emissions (Washington, D.C.: Government Printing Office, 1992); Environmental Law and Policy Center, Components of a Model Accelerated Vehicle Retirement Program, report to the Energy Foundation (Chicago, 1994); and President's Commission on Environmental Quality, Partnership to Progress: The Report of the President's Commission on Environmental Quality (Washington, D.C., 1993), pp. 30-31. Examples of cash for clunkers programs include the Accelerated Vehicle Retirement project and, in the private sector, the Union Oil Company of California in which 7,000 model-year 1970 and older vehicles registered in the Los Angeles Basin were scrapped.

Chapter 5

Natural Resources Stewardship

Stewardship is an essential concept that helps to define appropriate human interaction with the natural world. An ethic of stewardship builds on collaborative approaches; ecosystem integrity; and incentives in such areas as agricultural resources management, sustainable forestry, flsheries, restoration, and biodiversity conservation.

AMERICA IS BLESSED with an abundance of natural resources which provide both the foundation for its powerful and vibrant economy and serve as the source of aesthetic inspiration and spiritual sustenance for many. Continued prosperity depends on the country's ability to protect this natural heritage and learn to use it in ways that do not diminish it.

Stewardship is at the core of this obligation. It calls upon everyone in society to assume responsibility for protecting the integrity of natural resources and their underlying ecosystems and, in so doing, safeguarding the interests of future generations. Without personal and collective commitment, without an ethic based on the acceptance of responsibility, efforts to sustain natural resources protection and environmental quality cannot succeed. With them, the bountiful yet fragile foundation of natural resources can be protected and replenished to sustain the needs of today and tomorrow.

Stewardship will become more challenging, however, as the human population grows and its needs and expectations put greater pressure on the environment. As the population increases, so too will demands for fertile soil, clean and abundant water, healthy air, diverse wildlife, food, fuel, and fiber. And as the stresses on society intensify, so too will the need felt by individuals and families to turn to the natural landscape for beauty, solitude, and personal renewal. But if present trends continue and stewardship is not widely embraced, more people will face the results of having less available for them.

Recent years have presented Americans with examples of the apparent conflicts between human needs and the ability of natural resources to meet them. Some stem from use of or harm to resources once perceived as inexhaustible. Other conflicts stem from development decisions made when information was too sketchy to anticipate their full consequences. The depletion of once-abundant ocean fish stocks, the decline of Pacific salmon runs, the loss of old-growth forests, and struggles over the uses of freshwater supplies are clear reminders of the need today for greater stewardship of natural resources for the future.

Renewable resources - together with such nonrenewable resources as oil and gas, metals, industrial minerals, and building materials - contribute to the foundation of the economic and social development of the country. Conversion of these resources for human benefit has

sometimes resulted in costly and unforeseen environmental consequences, many of which are only recently being fully recognized.

Public lands, including national forests and grasslands, national parks, national wildlife refuges, and rangelands, comprise a significant portion of the landscape. By statute, federal agencies are to administer these lands for the benefit of all Americans, including those who live near public lands or whose economic well-being depends on the goods and services these lands produce. Public lands are managed for multiple purposes; at times these purposes can conflict. Consider, for example, the many uses of public land resources. They offer extensive recreational opportunities, support millions of acres of cattle and sheep grazing, produce billions of board feet of timber, are the source of extensive energy and mineral resources, supply water to many metropolitan areas, and often represent the last remaining reserve for unique ecosystems and biological resources. Studies by the U.S. Department of the Interior's Bureau of Land Management have shown that the cumulative effects of past activities on public lands have led to serious environmental problems, including degraded aquatic and riparian systems; less productive rangeland conditions; fragmented plant, animal, and fish habitats; and decline in forest health.[1] Future stewardship of these public lands is critical to the economic and environmental well-being of many regions of the United States, and has important implications for the country as a whole as well.

Nonfederal lands comprise 71 percent of the acreage in the United States. Private landowners and state and local governments are responsible for the natural resources on nearly 1.6 billion acres of land. The majority of these nonfederal lands, almost 1.4 billion acres, are privately owned.[2] Thus, the commitment Americans have to conserving the natural heritage for future generations is best demonstrated through the stewardship of their own lands. Many owners of private lands have pursued ideals of stewardship, enhancing the economic and aesthetic values of the land, and giving both landowners and the community a sense of place. Private decisions on managing these lands have long determined the quality, vitality, and fate of natural resources and will continue to do so. Ecological integrity of the nation's natural systems will continue to depend on private choices.

Privately owned lands, however, are most often delineated by boundaries that differ from the geographic boundaries of the natural system of which they are a part. In some cases, therefore, individual or private decisions can have negative ramifications. For example, private decisions are often driven by strong economic incentives that result in severe ecological or aesthetic

consequences to both the natural system and to communities outside landowner boundaries. The Council has recognized this barrier to achieving sustainable development. The key to overcoming it is to strengthen stewardship commitments through public policies and individual actions that reflect the principles of sustainable development and support for collaborative processes to enable landowners to enhance the value, productivity, and ecological integrity of their lands.

Although much remains to be done, the United States has made major strides in achieving a healthier environment and better protection of its natural resources. For example, by 1994, 14 million acres across the United States were protected through regional, state, and local land trusts. These private and voluntary efforts have produced a 49-percent increase in conservation acreage since 1990.[3] Citizens, environmental organizations, and government at all levels are working together to save precious natural resources while safeguarding jobs and local traditions. Actions to protect the bayous of southern Louisiana, Mono Lake in the Sierra Nevada Mountains, and striped bass in the Chesapeake Bay are but a few examples of collaborative approaches to natural resources stewardship. Soil conservation is another case in point. Faced with increasing soil losses due to erosion, Congress enacted the Conservation Reserve Program in 1985, which authorizes contracts with farmers to convert highly erodible cropland to less intense forms of production such as trees and permanent grasses.[4] Since then, 36.4 million acres, or 9 percent of cropland has been retired from crop production; on this land, soil erosion has dropped by 93 percent.[5]

Stewardship of the ocean's resources is also critical to the nation's public trust responsibility. Oceans provide jobs, recreation, and transportation to coastal communities, where more than three-fourths of the country's population are expected to reside by the year 2000.[6] The sustainable use of these marine ecosystems, as well as the species that inhabit them, is crucial to the future of these regions and the nation.

Ensuring that an environmental stewardship ethic is a guiding principle of natural resources management requires a lifelong commitment from individuals, communities, corporations, and the nation--today and for generations to come. How can society best develop and maintain a commitment to stewardship? The answer is multifaceted, but it starts with understanding the dynamics at work in the environment and the connection among environmental protection, economic prosperity, and social equity and well-being. It depends on the processes by which individuals, institutions, and government at all levels can work together toward protecting and restoring the country's inherited natural resource base. Education, information, and communication are all important for developing a stewardship ethic. Also important is the widespread understanding that people, bonded by a shared purpose, can work together to make sustainable development a reality. The following policy recommendations and actions offer ways in which stewardship can help move the nation toward sustainable development.

Using Collaborative Approaches to Manage Natural Resources

The collaborative decision-making processes described in chapter 4, "Strengthening Communities," can be particularly useful in the responsible stewardship of natural resources. Collaborative approaches can apply both to public and private resources when the decisions made on their use have broad implications for the whole community. What has become clear is that the conflicts over natural resources increasingly are exceeding the capacity of institutions, processes, and mechanisms to resolve them. Adversarial administrative, legal, and political processes are common venues for challenges to the many interests in natural resources. These processes typically stress points of conflict, dividing communities and neighbors. Litigation tends to be acrimonious and costly, often resulting in solutions that do not adequately address the interests of one or more key stakeholders. What is usually missing from the process is a mechanism to enable the many stakeholders to work together to identify common goals, values, and areas of interest through vigorous and open public discussion within the constraints of antitrust laws. The Council endorses the concept of collaborative approaches to resolving conflicts.

In its meetings and task force groups, the Council found that communities, citizens, and other stakeholders across the country are inventing and using their own collaborative processes. For example, stakeholders within the Feather River Watershed in northeastern California, an area containing portions of three national forests--Plumas, Lassen, and Tahoe--created a forum for people living there to use "common sense to achieve obvious goals: healthy forests and healthy small-town economies through time." Known as the Quincy Library Group (named for the library in Quincy, California, where it holds its meetings), the community-based group began by developing a management plan for the 2.5 million acres of prime federal timber land and is now working on steps to carry it out.

These types of groups are discovering and demonstrating that collaborative approaches, based on a framework of natural systems or defining land forms such as watersheds, offer useful tools for identifying common visions and goals for advancing stewardship and resolving conflicts. Experience is showing that they can serve as reliable means for addressing different interests; putting near-term problems in the context of long-term needs; integrating economic, environmental, and social considerations; building from but moving beyond the limits of narrow jurisdictions and authorities to adopt innovative solutions; and reflecting community interests as well as the interests of citizens elsewhere. Collaborative approaches envisioned here can give impetus to stakeholders and communities to make use of best available science in their decision-making processes, meet and exceed legal requirements for protecting the environment, monitor natural resources status and trends, and exercise collective responsibility for practicing and passing on a stewardship ethic.

Basing collaborative approaches on natural systems encourages people to identify with a particular place and take responsibility for it. Frequently, people do not feel connected to a place or locale and so do not feel responsible for taking care of it. Decisions typically get made in fragmented ways, and the connection between individual lives and the health of an ecosystem can seem remote. Yet human activities are very much connected to the ecological integrity of a natural system, such as a watershed, and considering their effects within a framework based on a defining natural system can highlight cause-and-effect relationships; identify long-term implications; and lead to solutions that integrate economic, environmental, and equity goals. Construction practices that keep harmful sediments from accumulating in rivers and lakes help protect water quality for drinking and swimming, for example. Careful planning of a community's development along a lake or river can enhance property values, increase merchants' sales, add to people's appreciation of the natural environment, and protect wildlife habitat. The possibilities for recognizing and responding to these kinds of interrelationships abound.

Government plays a critical role in conserving, protecting, and restoring natural resources by setting and maintaining a foundation of strong environmental laws and regulations. Enforcement is an important component, particularly for pollution control. No single government agency or collection of unconnected agencies is sufficient. No set of statutes or regulations--however comprehensive and detailed--can take the place of the commitment by individuals and communities to protect natural resources and ecological integrity. Individuals, communities, and institutions need to work individually and collaboratively to ensure stewardship of natural systems.

Finding an acceptable integration of local, regional, and national interests is not without difficulty. Issues involving public lands and marine resources, for instance, require that a broad, national perspective be maintained. However, local stakeholders for the various interests involved in a particular natural resources issue may be able to contribute to more informed and reasoned choices--collectively--for resolving issues. At the same time, many people who live at a distance from a particular natural resource system can have strong and legitimate interests in the broad, national perspective be maintained. However, local stakeholders for the various interests involved in a particular natural resources issue may be able to contribute to more informed and reasoned choices -- collectively -- for resolving issues. At the same time, many people who live at a distance from a particular natural resource system can have strong and legitimate interests in the outcome of its multiple uses. To ensure that all interests are represented, all stakeholders need to be involved in the decision process. Who are stakeholders? The definition needs to be broad. Stakeholders include those who live, work, recreate in, or are committed to the well-being of the watershed or other defining land form and the natural resources issues of concern. They include federal, state, and local governments; community members and institutions; businesses; national and other nongovernmental organizations; and private citizens.

Characteristics of successful collaborative approaches are emerging. Among them are use of a framework based on a natural system such as a watershed or bioregion, voluntary

multistakeholder discussions, a transparent process open to the public, incorporation of existing law, and use of the best available science.

Government agencies at all levels have a pivotal role to play in encouraging stakeholders to search for common goals, resolve conflicts, apply the best available science, inventory and monitor natural resources status and trends, and exercise collective responsibility for overall natural resources conditions.

POLICY RECOMMENDATION 1

COLLABORATIVE APPROACHES

Use voluntary, multistakeholder, collaborative approaches to protect, restore, and monitor natural resources and to resolve natural resources conflicts.

ACTION 1. The President should issue an executive order directing federal agencies under the Government Performance and Results Act to promote voluntary, multistakeholder, collaborative approaches toward managing and restoring natural resources.[7]

ACTION 2. Governors can issue similar directives to encourage state agencies to participate in and promote voluntary, multistakeholder, collaborative approaches.

ACTION 3. Public and private leaders (within the constraints of antitrust concerns), community institutions, nongovernmental organizations, and individual citizens can take collective responsibility for practicing environmental stewardship through voluntary, multistakeholder, collaborative approaches.

ACTION 4. The federal government should play a more active role in building consensus on difficult issues and identifying actions that would allow stakeholders to work together toward common goals. Both Congress and the executive branch should evaluate the extent to which the Federal Advisory Committee Act poses a barrier to successful multistakeholder processes, and they should amend regulations to help accomplish this.[8]

MONO LAKE AND "DROUGHT-PROOFING" LOS ANGELES

In 1990, Mono Lake was on the verge of ecological collapse. Located high in a remote part of the Sierra Nevada Mountains of California, the lake's diverted tributaries supplied Los Angeles with about 14 percent of its water. After almost 50 years of diversions, Mono Lake's shoreline had dropped 42 feet, exposing it to a host of environmental risks. Toxic dust storms arose from the recently exposed banks. The natural salinity of the water doubled, dramatically reducing its productivity. Of the 1 million ducks and geese that had once migrated to the lake, fewer than 1

percent returned.

Meanwhile, southern California faced its seventh year of below-normal rainfall -- a dire situation for this fast-growing, high-population area. Imported water, diverted from Mono Lake and other sources located throughout the Sierra and Rocky Mountains, is lifeblood for the and metropolis of greater Los Angeles, home to more than 14.5 million people. As the prolonged drought continued, city officials and area business leaders worried that the water shortage would threaten the region's economic stability Local and national environmentalists were equally worried that the growing thirst of the growing city would destroy treasured wilderness areas like Mono Lake.

The Mono Lake Committee, a citizens' group with more than 17,000 members, was organized to save Mono Lake. From the outset, the committee recognized that this could only be done by reducing the diversion pressures. "Yet it's not enough to find a Mono Lake-only protection plan," says Martha Davis, executive director of the committee. "It was also important to understand Los Angeles' needs and the needs of the state. We refused to promote solutions that would transfer environmental problems from Mono Lake to another ecosystem or watershed." Working with Los Angeles, California, and area businesses, the Mono Lake Committee set out to "drought-proof" Los Angeles.

Water conservation was the first priority. The city pledged to reduce water use by 20 percent. Ultra low-flush toilets were installed in most homes. Higher water prices discouraged unnecessary use. By 1994, the city had exceeded its goal, and water use was identical to 1975 levels -- even with 800,000 more residents. But conservation was not enough.

"We've reached a point in water management where if it's not water reuse, it's water abuse," comments Bureau of Reclamation Commissioner Don Beard. Imported water is still needed for households, but recycled water can be used for many industrial purposes. The collaboration of government and private organizations developed a plan to reclaim and conserve more than 135,000 acre-feet of water annually -- twice the amount of water needed to protect Mono Lake. State and federal agencies pledged $86 million to build two water reclamation projects. Businesses liked the estimates showing that reclaimed water was $347 per acre-foot, $64 less than imported water

The plan allowed the state to issue an order in September 1994 restricting water diversions from Mono Lake. With its rewatered streams, Mono Lake will ultimately rise about 16 feet -- a level that most ecologists believe will preserve the integrity of the lake and its ecosystem. Waterfowl will return to its shores. Aquatic life will be restored. "We are," explains Los Angeles City Council member Ruth Golonter, "preserving one of America's most significant ecological treasures."

Using Ecosystem Approaches to Natural Resources Management

America's history of natural resources management started just before the turn of the last century. Since then, a complex array of state and federal natural resources management laws and implementing agencies has been created, each attempting to balance new tensions over the use and conservation of a particular resource. Around each resource - whether forests, water,

fisheries, wildlife, or recreation areas - distinct policies, institutions, constituents, and professions have evolved. Because the health and productivity of these resources and the communities that depend on them are often linked, policies and practices in one resource area have frequently had negative and unintended consequences for other resources. For example, irrigation and flood control projects have sharply diminished salmon populations in California and the Pacific Northwest, creating divisive and protracted conflicts among resource users.[9]

In addition, science and experience have shown the variety of resources, importance of ecological processes such as nutrient cycling, fire, and hydrologic cycles - some of which operate over broad geographic areas - in determining the condition of a natural resource in a particular place. For example, forest management policies and practices in the Rocky Mountain region were developed before the importance of fire as a factor in forest health was recognized. Because the role of ecosystem processes was not considered, today there are difficult and costly management decisions to be made to restore the vitality of the region's forest ecosystems and the local economies that depend on them.

The shift from managing a single resource or a single species to managing an ecosystem for a variety of resources, including the maintenance of its biodiversity, makes sense. And there are numerous advantages to using the best scientific, social, and economic information and fostering collaboration among landowners and other stakeholders -- actions that characterize this new generation of natural resources management. Scientific information is essential in identifying which ecosystem processes are vital to the productivity of a wide array of natural resources, while social and economic information can identify which strategies will best meet public demands and landowner objectives. Ecosystem management cooperative efforts can often be accomplished through voluntary participation, carefully accounting for landowner objectives. For example, properly planned forest management activities, including various types of harvesting, can be compatible with ecosystem processes and can be used effectively to simulate natural events.

Concerned about the cumulative impact of numerous local management actions, many scientists and resource managers now believe that biodiversity, water quality, and other natural resources can only be protected through cooperative efforts across large landscapes -- landscapes that often cross ownership boundaries. At the same time, conflicting demands for all resources are forcing public agencies to explore new planning and policy mechanisms that would involve broader public participation to minimize conflicts. Since 1992, federal agencies, including the U.S. Forest Service, the U.S. Bureau of Land Management, the U.S. Fish and Wildlife Service, the U.S. National Park Service, and the U.S. Environmental Protection Agency, have established ecosystem management policies to guide their decisions for achieving various goals, including those set by law.

Independently, a number of efforts have been undertaken to combine the use of ecosystem approaches with greater public participation. They have used such mechanisms as regional planning or advisory groups to integrate natural resources management decisions. Conservation

groups; local governments; private landowners; and forest products, energy, and utility firms -- among others -- are now involved in dozens of cooperative efforts to use ecosystem approaches for natural resources management around the country. More open communication and closer collaboration can enable ecosystem approaches to anticipate potential problems and conflicts, and identify potential solutions. Also, using adaptive management techniques to monitor results and incorporate lessons learned can ensure that shared goals are met and costly mistakes avoided.

Still, the effective and widespread application of collaborative ecosystem approaches faces a number of challenges. First, the approaches are new and experimental. Of the nearly 150 examples of ecosystem approaches to natural resources management in the United States identified by The Keystone Center's national policy dialogue on ecosystem management, nearly all have been initiated since 1990. Because the lessons of these early initiatives are just beginning to emerge, public agencies, landowners, and various interest groups can learn from these efforts. Second, ecosystem approaches offer the most promise for public and private lands that are managed for multiple uses such as forestry, fisheries, grazing, and recreation. It is in these areas that cooperative efforts to maintain important ecosystem processes will offer the greatest benefits for long-term resource productivity and biodiversity conservation.

Ecosystem approaches have been recognized by stakeholders with differing perspectives as a means to move forward in a new era in which scientific information, stakeholder communication, and management cooperation will be essential in making widely accepted decisions that perpetuate America's natural resources. The following recommendations provide a basis for making ecosystem approaches to natural resources management more effective.

POLICY RECOMMENDATION 2

ECOSYSTEM INTEGRITY

Enhance, restore, and sustain the health, productivity, and

ACTION 1. Federal and state agencies should identify and address areas in which interagency cooperation is needed for sustaining ecosystems, natural resources productivity, and biodiversity; and they should allocate funds to ensure successful cooperation. Since many agencies operate under laws passed decades ago, they should help revise policy frameworks to address the needs of maintaining

biodiversity of terrestrial and aquatic ecosystems through cooperative efforts to use the best ecological, social, and economic information to manage natural resources.

ecosystem processes and the resources that depend on them.

ACTION 2. Conservation groups, private landowners, and local governments should identify actions and conditions that will advance their objectives and so are most important for their participation in ecosystem approaches to natural resources management.

ACTION 3. Government agencies at all levels should help cooperative local efforts use ecosystem approaches to natural resources management by providing access to information, technical assistance, and funding and by removing policy and administrative obstacles to successful ecosystem approaches.

ACTION 4. Federal and state agencies, in collaboration with localities, should develop indicators which can be used to monitor the status of ecosystems and natural resources productivity. They should encourage consensus goals and shared responsibilities for restoring damaged ecosystems.

ACTION 5. Government agencies, conservation groups, and the private sector should expand the use of ecosystem approaches by using collaborative partnerships, developing compatible information databases, and carrying out appropriate incentives for responsible stewardship.

PROTECTING LOUISIANA WETLANDS

Each year, a total of about 35 square miles of coastal Louisiana wetlands, or a football field worth of land every 15 minutes, washes into the sea. The rapid erosion is threatening natural ecosystems and hundreds of communities that located on the delta where the Mississippi River meets the Gulf of Mexico. But the outlook is changing -- thanks in part to the Louisiana Coastal Wetlands Interfaith Stewardship Plan, formed in 1986 to help congregations across Louisiana understand the magnitude of the problem and look for possible solutions. Since then, churches and synagogues throughout coastal Louisiana have sponsored 20 forums attracting more than 2,000 people interested in learning why and how to protect and restore wetlands.

At first, the presence of churches and synagogues in a resource conflict puzzled some. "Among my earliest experiences was a meeting at the Department of Natural Resources in Baton Rouge," remembers Rob Gorman, a social worker for Catholic Social Services for the region. "On one side of the room were executives from the Louisiana Chemical Association, Mid-Continent Oil

and Gas, and the Louisiana Landowners Association, On the other side were activists from the Environmental Defense Fund, Louisiana Wildlife Federation, and Sierra Club. I was introduced as from Catholic Social Services and virtually all heads turned and someone asked the question: "What is the church doing here?"

"I explained that religious congregations had to be present because of our understanding of stewardship and our social justice commitment to preserving the jobs of family fishermen and all others dependent upon the resources of the wetlands," Gorman continues. "Let's call it a moral obligation. Environmental degradation and poverty go hand in hand."

The presence of the religious community helped break open the debate In ways that might otherwise not have been possible. People act differently when they meet in a church instead of a corporate boardroom or state hearing room," says Mark Davis, executive director of the Coalition to Restore Coastal Louisiana. It also helped to build stronger grassroots support for coastal protection, which spurred a series of important measures. In 1989, the voters in the state approved by a three-to-one margin the Louisiana Wetlands Conservation and Restoration Trust Fund. The following year, Congress approved the Coastal Wetlands Planning, Protection, and Restoration Act, which included $ 1.5 billion in funds to help restore Louisiana's wetlands.

The President's Council on Sustainable Development heard from religious leaders on April 26, 1995, during a roundtable held in conjunction with a Council meeting in Son Francisco. "God made the Earth, made it beautiful, and made us to cherish and protect it," observed Paul Gorman, executive director of the National Religious Partnership for the Environment. "With its breadth of outreach, moral witness, capacity to motivate, firm foundation in mainstream values, and ability to bring diverse groups together, the American religious community can make a profound contribution to the search for sustainability."

Emphasizing Incentives and Eliminating Disincentives for Natural Resources Stewardship

Another important step for encouraging natural resources stewardship of public and private lands and waters is to review and, where necessary, overhaul the wide range of incentives and disincentives affecting such stewardship. The need for review is particularly important in light of funding cuts in government natural resources programs. The challenge is to identify new, market-based approaches to promoting stewardship and participatory planning and to eliminate subsidized programs that promote or encourage unsustainable activities, rather than only reacting to problems after they have become intractable. Examples of the latter include controversies associated with federally owned resources such as minerals, forage, and timber.

While public lands play an important role in achieving a national goal of sustainability, private lands are also critical to achieving sustainability and natural resources conservation because 64 percent of the lands in the continental United States are privately owned.[10] Moreover, of the 728 species listed as endangered or threatened under the Endangered Species Act, 50 percent are found on federal lands at least once, while the other 50 percent are found on a combination of nonfederal lands, including state and locally owned lands and private lands." To date, existing laws and regulations by themselves have not been entirely satisfactory in achieving positive results.

In the case of timber lands, encouraging improved stewardship of private industrial and nonindustrial forest lands offers an opportunity to enhance profitability and accrue long-term ecological benefits. Encouragement could come in the form of increased technical or financial assistance, or both. Nonindustrial private forest landowners own 287.6 million acres or 59 percent of the nation's 490 million acres. The forest industry owns another 70 million acres or 14 percent. 12 Although most forest lands are managed for multiple use, private forest lands are often managed with a stronger emphasis on fiber production than are public forest lands. Private lands are also capable of producing more wood at a lower cost per unit than public timber lands. Because of these factors, private forest land figures significantly in market-based approaches to promoting natural resources stewardship. A review of potential incentives for timber production on private forest lands might lead to opportunities to meet society's demand for forest products and provide jobs, a sound tax base, and high environmental quality in a more economically efficient way.

As discussed in chapter 2, "Building a New Framework for a New Century," correctly designed market incentives used within an appropriate regulatory framework can provide the most efficient set of tools to relieve and redirect pressures that are leading to degradation or depletion of the natural resource base on which the country's social, economic, and environmental vitality depends.

Public policies that undermine stewardship and encourage excessive exploitation of resources include public expenditures that lead to ecologically or economically harmful projects and tax policies that promote resource degradation. Public policies and private activities aimed at conservation can create a combination of economic self-interest, voluntary action, and, when necessary, regulatory controls to promote sustainability. By integrating public policy with market-driven economic incentives, including least-cost methods, appropriate regulations can encourage private property interests and users of public lands to make socially desirable and beneficial decisions that promote resource conservation. The challenge is to remove disincentives and establish incentives in three distinct areas.

- **Subsidies.** Many subsidies encourage consumption-based rather than conservation-based behavior by obscuring the true costs of decisions. Examples of subsidies in direct conflict with other laws and policies include subsidized overgrazing of public lands, leading to the destruction of habitat and reduced productivity. Similarly, cheap hydropower and

subsidized diversion of water for irrigation jeopardize the continued existence of Columbia River salmon and other endangered species, and price supports for sugar production lead to habitat loss and increasing pollution of Florida waterways.

- **Expenditures.** Public expenditures on economic infrastructures such as roads, dams, schools, and industrial parks can "encourage investment and induce development in areas that might not otherwise be attractive to development; such developments are often environmentally dubious, too. This would be the case, for instance, when they encourage sprawl that requires new costly infrastructure or agriculture that requires costly subsidized electricity.

- **Taxation.** Tax codes and policies, if properly designed, can promote sustainability and resource conservation by creating incentives and disincentives to promote sustainability and can transfer value among various segments of society. These tools do not eliminate costs of sustainability and conservation, but rather transfer costs from the private to the public sector. Tax incentives include property tax reductions for those who commit to managing property for species of concern, tax credits for expenses incurred in improving degraded habitat or creating new habitat for target species, transferrable development rights and land swaps, or capital gains treatment of returns from sustainable managed timber operations to encourage this continued land use. Other incentives are tax deductions for income derived from economic activity on lands managed fully and perpetually for species of concern; inheritance tax reform to promote conservation by ensuring that large tracts of habitat do not have to be liquidated, broken apart, or devoted to more economically intensive use as a consequence of inheritance taxes (or their avoidance); capital gains tax deferral on land transfers that facilitate or continue to provide for conservation; and exploration of the use of conservation credits as a mechanism to create a market for environmentally protective actions.

In sum, executive and legislative bodies at the federal, state, local, and tribal levels responsible for tax, economic, and other policies that influence natural resources should remove disincentives that undermine stewardship and establish incentives for sustainable resources management and protection.

POLICY RECOMMENDATION 3

INCENTIVES FOR STEWARDSHIP

Create and promote incentives to stimulate and support the appropriate involvement of corporations, property owners, resource users, and government at all levels in the individual and collective pursuit of stewardship of natural resources

ACTION 1. Commercial users of public resources should pa the full cost associated with the depletion or use of those resources - reflecting both market and nonmarket values. For example, decisions on providing access for timber and grazing uses should take into account not only financial costs but net impacts on ecological systems (positive as well as negative), including effects on water quality and biological diversity.

ACTION 2. Federal, state, local, and tribal officials, in making decisions on public infrastructure projects, should weigh the economic benefits of the project against the full costs - incorporating both market and nonmarket costs, such as the net impacts on the ecological system. Existing projects should be reengineered to the extent possible to restore ecological functions and habitat using cost-benefit analyses, including both market and nonmarket values.

ACTION 3. Legislative bodies at the federal, state, local, and tribal levels should extend tax credits and deductions to promote actions taken by property owners to enhance the long-term conservation value of their property beyond compliance with existing regulations.

ACTION 4. Landowners who take conservation action beyond compliance with regulations, such as establishing habitat for endangered species, should not face penalties for returning to the regulated standard.

ACTION 5. State, local, and tribal governments should identify habitats of particular ecological concern and establish impact fees or mitigation requirements to shift effects to regions of lower concern.

ACTION 6. State and federal governments should establish, through general taxes or user fees on public resources, a trust fund to be used in purchasing particularly ecologically sensitive or valuable habitats.

ACTION 7. The federal government should develop a matching fund program to encourage federal, state, local, and tribal investment in sustainable programs and projects.

ACTION 8. The federal government should establish a revolving fund to enable local communities to undertake the planning required to develop incentive-based resource conservation programs.

Securing Sustainable Agriculture

Fundamental to the conservation and stewardship of natural resources is the role of sustainable agriculture. There are at least four levels at which agricultural sustainability is important to

sustainable development in the United States. These are the field, the farm, the ecosystem, and the nation.

At the field level, sustainable use of technology and natural resources is essential to the maintenance of agricultural productivity. Appropriate use of soil and water helps to conserve these vital resources for future generations and promotes economic efficiency.

At the farm level, financial viability is important for the economic health of the agricultural sector and the development and quality of life of rural communities.

At the ecosystem level, health and sustainability depend heavily on agricultural activities. Because agriculture uses such a large amount of the land base and water supply, it inevitably has significant effects on wildlife habitat, recreation, marine and freshwater fisheries, municipal and industrial water treatment, shipping, and water storage.

At the national level, agricultural sustainability has many facets. Agricultural productivity determines food prices in the domestic market and influences the nation's ability to compete in export markets. The direction of agricultural research and development, coupled with economic incentives, plays a large role in farmers' production practices and therefore affects food costs and quality as well as the environment. Finally, agricultural markets and products account for 16 percent of U.S. employment.[13]

Consideration of sustainability at these various levels is woven throughout the following discussion and recommendations on sustainable agriculture.

Stewardship of prime farmlands is a fundamental component of sustainable agriculture. Prime farmlands are highly productive, versatile, or otherwise unique and are of strategic importance to the nation as a whole as well as to individual regions. A number of pressures, both internal to agriculture and external to it, threaten the quality of the natural resources base upon which domestic production of food, feed, fuel, and fiber depend. Although total cropland in the United States has stayed nearly constant since 1945 at 460 million acres, the loss of farmland to urban and other nonfarm uses can be a major local or state issue. Much of the best farmland is adjacent to major metropolitan areas and is being converted to nonagricultural uses.[14]

Management of farms and rangeland is a key part of sustainable agriculture. Mismanagement can result in negative environmental consequences and create a loss of productivity through such processes as erosion, salinization, overfertilization, and misuse or accidental releases of pesticides and fertilizers. Agricultural land use is a significant contributor to impaired water quality of rivers, lakes, and estuaries. Other consequences of agricultural land use include risks to human health, loss of wildlife habitat, and declining biodiversity.[15] Because of these factors, stewardship of productive cropland and grazing land as a natural resources base is critical to the nation's future.

Farmers and ranchers control a significant portion of the land area of the United States. Of the 1.9 billion acres of land in the United States (excluding Alaska), approximately 907 million are

dedicated to agriculturally related purposes, including cropland, pasture, and rangeland.[16] Agricultural activities are central to both the national economy and rural economies and have significant effects on conservation of natural resources, governmental budgets, and international trade.

American agriculture is in transition. The number of farms declined by almost 31 percent,from 2.9 million in 1970 to 2 million in 1994, as the average size of farms increased about 28 percent in the same period. During the 1978-92 period, the number of families in farming decreased about 15 percent, and total farm employment dropped 19 percent.[17]

New strategies are needed to address the changing situation. In the past, federal and state governments have designed many resource conservation programs from the top down, with inadequate local involvement. Community priorities are often not heard or understood. To continue moving toward sustainable agriculture, local communities need to be empowered to participate.

Agricultural sustainability can be enhanced by the application of an integrated whole-farm/whole-ranch systems approach which addresses the social, economic, and environmental effects of agriculture and recognizes the interrelationships among management practices. The systems approach includes management of various factors, such as nutrients, pests, irrigation, and soil, on a site-specific basis. This approach involves steps to develop, demonstrate, and evaluate whole-farm and whole-ranch systems on a wider scale. The public and private sectors should encourage farmers to adopt this approach on a voluntary basis.

WHAT IS SUSTAINABLE AGRICULTURE?

Sustainable agriculture is an integrated system of plant and animal production practices having a site-specific application that will, over the long term, satisfy human food and fiber needs; enhance environmental quality and the natural resources base upon which the agricultural economy depends; make the most efficient use of both nonrenewable resources and on-farm/ranch resources and integrate, where appropriate, natural biological cycles and controls; sustain the economic viability of farm/ranch operations; and enhance the quality of life for farmers/ranchers and society as a whole.

CONSERVING THE SOIL

Controlling erosion not only sustains long-term productivity of the land, but also reduces the amount of soil, pesticides, fertilizers, and other substances that can move into the nation's waters. By 1992, American farmers had reduced soil erosion on cropland by almost 1 billion tons per year from 1982 levels, according to the U.S. Department of Agriculture's 1992 National Resources Inventory. This is enough topsoil saved in one year to fill a convoy of dump trucks 95 abreast stretching from Los Angeles to New York. Soil erosion savings have come about through the Conservation Reserve Program (700 million tons), conservation technical assistance (300 million tons), and conservation compliance (100 million tons).[18]

Federal and state actions related to integrated farming systems should be consistent, with a view toward:

- Renewing and refining targeted land retirement programs to improve cost-effectiveness and enhance pollution prevention, wildlife, and conservation benefits;
- Building on conservation requirements of the 1985 and 1990 farm bills and the Farmland Protection Policy Act;"
- Giving greater protection to prime farmland from conversion to nonagricultural uses;
- Supporting initiatives for environmentally friendly pest management techniques with the goal of encouraging agricultural producers - with assistance from public and private partners - to implement integrated pest management;
- Managing animal waste to avoid pollution of ground and surface water;

Reducing agricultural damage to local air and water quality and the global environment; and

- Reducing consumption of nonrenewable energy.

Successful promotion and adoption of sustainable agriculture practices depend on technological innovation and dissemination. Agricultural research should be refocused toward integrated farming systems that jointly address productivity, profitability, improved efficiency, and environmental protection. This will require more interdisciplinary research. Educational programs to transfer knowledge of existing and developing technologies can be improved. Effective transfer systems include mechanisms to teach and demonstrate these technologies at the local level. Institutions can provide incentives to reward those who develop such research

and educational programs. In addition, it is important to recognize the efforts of U.S. agencies and international institutions that are promoting sustainable agriculture in developing countries.

Federal agricultural commodity programs should be made more flexible to encourage farmers to respond to market signals, improve crop rotations, and diversify the mix of agricultural goods produced, all to enhance profitability and environmental quality. Granting greater flexibility to farmers can result in environmental improvements when farmers adopt resource-conserving practices; this can also lead to gains in profitability as farmers become better equipped to manage in ways that reduce the amount of resources used. The historic lack of flexibility in base-acreage requirements, for example, has created barriers to diversification of operations, good stewardship practices and systems, and improved efficiency and profitability.

In practice, sustainable agriculture can:

- Ensure a readily available, affordable, and continuing supply of high-quality food and fiber to all sectors of American society;
- Provide commodities to fulfill a range of national objectives, including international trade and commitments for humanitarian food aid;
- Contribute to increasing efficiency and profitability on farms and to making rural communities vital and economically prosperous;
- Protect human health and the environment, with an increasing emphasis on pollution prevention; and
- Promote conservation of biodiversity through integrated farming systems.

Achieving Sustainable Management of Forests

Forests cover about one-third of the country - more than 737 million acres.[20] They provide a great diversity of economic, ecological, recreational, cultural, and spiritual benefits. Important steps - including both public and private action - have been taken to put the United States on an effective course for achieving sustainable forestry management. There is a rich fabric of laws, institutions, and activities under way at the federal, state, local, and tribal levels to guide management of the nation's forests.

In 1992, during the United Nations Conference on Environment and Development in Rio de Janeiro, the United States announced its commitment to carry out ecosystem management on all federal forest lands. And, at the Second Ministerial Conference on the Protection of Forests in 1993 in Helsinki, the United States declared its commitment to the goal of achieving sustainable management of all U.S. forests by the year 2000.[21]

A variety of international and domestic efforts are emerging that are intended to promote and expand sustainable forest management. These efforts include work by the U.S. Forest Service and other federal agencies, the Forest Stewardship Council, the Canada-U.S. Association of Rainforest Alliances through the Smartwood Network, the Stewardship Incentive Program, and the Society of American Foresters through its Long-Term Health and Productivity Initiative. These efforts offer a variety of approaches, including technical assistance, education, financial incentives, monitoring, and certification. Also contributing to promoting and expanding sustainable forest management are U.S. efforts in international negotiations.

Private initiatives include the American Forest and Paper Association's adoption in 1994 of the Sustainable Forestry Initiative.[22] This is a significant development. The association's membership is comprised of more than 400 forest and paper companies and related trade associations. Its members account for approximately 84 percent of the paper production, 50 percent of the solid wood production, and 90 percent of the industrial forest land in the United States. The initiative lays out principles and measures of performance for sustainable forestry management on industrial lands and nonindustrial private lands that supply timber to industry.

One of the key events in forestry is the Seventh American Forest Congress scheduled for February 1996 in Washington, D.C. It is being convened by a broad range of participant -- including environmental, industry, government, and academic leaders -- to develop a shared vision; set of principles; and recommendations for forest policy, research, and sustainable management of America's forests into the next century. Forest congresses have been held periodically since 1882 to provide a forum for rethinking the role of forests. The last one took place in 1975. The President's Council on Sustainable Development views the Seventh American Forest Congress as an opportunity to forge a nonpartisan, dynamic, and participatory course for the future. The Council's policy recommendation is intended to build on this and other initiatives already under way for sustainable management and protection of the nation's public and private forest lands.

POLICY RECOMMENDATION 4

AGRICULTURAL RESOURCES

Manage and protect agricultural resources to maintain and enhance long-term productivity, profltability, human health, and environmental quality.

ACTION 1. Government at all levels should seek to reduce the compounding and threatening effects of urban sprawl on prime farmland. States and localities can identify and take strategic measures to protect their prime farmland, including such policies as easements, zoning, taxation, financial incentives, and transportation.

ACTION 2. Government should clarify and revise policies and programs in potential conflict with each other and with the objectives of sustainable agriculture and should closely coordinate and consolidate related programs. For example, this could include consolidating certain conservation programs under the U.S. Department of Agriculture's (USDA’s) Natural Resources Conservation Service, integrating USDA

technical and financial resources with natural resources objectives, and strengthening soil and wetlands conservation programs.

ACTION 3. Agricultural producers can broadly implement integrated farming systems (whole-farm and whole-ranch planning) to ensure that agricultural activities maintain and enhance natural resources; protect human health and environmental quality, including the quality of water, air, and soil; and protect and enhance wildlife populations, habitat, and diversity.

ACTION 4. Partnerships involving USDA agencies, other federal and state agencies, conservation districts, private agricultural consultants, environmental organizations, commodity groups, and other interested organizations and individuals should be strengthened to implement natural resource, agricultural conservation, and water quality programs.

ACTION 5. The federal government should increase investment in sustainable agricultural research, technical support, and demonstrations of conservation techniques and sustainable farming systems.

ACTION 6. The federal government should continue to move toward market pricing for the use of public natural resources, including timber, water, oil and gas, minerals, and grazing, recognizing that there may be circumstances in which subsidies are warranted for the public good.

ACTION 7. The federal government should increase flexibility in farm commodity programs and improve access to capital to encourage farmers to respond to market signals, improve crop rotations, and diversify the mix of agricultural goods produced to enhance profitability and environmental quality.

POLICY RECOMMENDATION 5

ACHIEVEMENT OF YEAR 2000 SUSTAINABLE FOREST MANAGEMENT GOAL

Establish a structured process involving a representative group of stakeholders to facilitate public and private efforts to

ACTION 1. The President should direct USDA, the U.S. Department of the Interior, and other relevant agencies to build upon, support, and promote ongoing efforts to achieve sustainable forest management. These efforts should address such areas as national and international initiatives, terms of reference, criteria for defining sustainable forest management and indicators to measure progress toward their achievement, and use of resulting information in policy formulation. The agencies should explore various means for accomplishing this; the Seventh American Forest Congress offers one important avenue.

define and achieve the national goal of sustainable management of forests by the year 2000.

Replenishing and Protecting Fisheries

Stewardship offers a conceptual framework for integrating the use of resources with environmental safeguards. With stewardship, future generations can enjoy a rich diversity of freshwater and marine life. This need is evident. Entire communities and the nation as a whole have experienced significant economic and social damage due to the precipitous decline - and sometimes complete collapse - in freshwater, marine. and estuarine fisheries. Habitat degradation combined with overfishing can create what has been called commercial extinction in once-abundant fish stocks.

From Georges Bank off the New England Coast to the Gulf of Mexico to the Columbia River, the decline is evident. For example, on the West Coast, 214 salmon runs are considered at risk, two of which are endangered due to commercial exploitation and habitat degradation. Habitat degradation, hydropower generation (which hinders salmon migration and diminishes water quality), hatchery practices, and harvesting activities are the primary causes of decreases in stocks of salmon and other anadromous fish. Habitat degradation, hatchery operations, and overharvesting also harm many estuarine fish.[23] The dramatic decline in freshwater, marine, and estuarine fisheries underscores the need for stewardship based on a system of effective laws, regulations, and programs.

Applying sound, comprehensive scientific information to the development of national fishery policy can reduce or eliminate much of the uncertainty that is impeding protection of freshwater and marine fisheries today. Implementation of science-based fishery management plans will help resolve the problems facing some fisheries, such as overfishing and the loss of spawning and nursery habitat, including fragile freshwater and coastal habitats. But improved management and correction of overfishing alone will not be enough to turn around the sharp decline in fish stocks. Protection and restoration of aquatic ecosystems and proper care of watersheds and riparian habitats are critically important. New policies need to be initiated and existing ones continued and enhanced to eliminate, mitigate, and prevent activities that degrade habitats.

Restore habitat and eliminate overfishing to rebuild and sustain depleted wild stocks of fish in U.S. waters.

POLICY RECOMMENDATION 6

RESTORATION OF FISHERIES

ACTION 1. The U.S. Department of Commerce - in conjunction with the National Marine Fisheries Service; the Regional Fisheries Management Councils; and other relevant federal agencies, state fisheries management agencies, and tribes - should develop fishery management plans that remove the human causes of fish population decline, including the elimination or mitigation of habitat degradation activities and incentives that encourage such activity. These plans should adopt the precautionary principle in decisionmaking that in the face of scientific uncertainty, err on the side of resource conservation.

These plans should address reduction in capitalization; improvement in the precision of science used for decisionmaking; quantitative assessments of social and economic effects associated with specific fisheries; public and private mitigating actions; reductions of bycatch, or sea life incidental to the catch of targeted species; improved cooperation and coordination among fisheries and land management agencies, private industry, hydropower agencies, and other stakeholders; and better programs to prevent accidental introduction of exotic species.

ACTION 2. The federal government, working with regional councils, states, and other stakeholders, should establish an allocation system for threatened U.S. fisheries as a possible fishing management tool. The system would set a limit on the number of fishermen eligible to work in threatened fisheries. In these cases, the stakeholders could explore a trading program that would enable fishermen to buy and sell the limited fishing rights. This action would create a cost-effective program for limiting fishing and thereby reduce pressure on endangered fish stocks. In determining whether to adopt a system of trading fishing rights, the economic impact on the industry must be considered.

THE RETURN OF THE ATLANTIC STRIPED BASS

In 1993, record numbers of striped bass, or rockfish, were hatched in the Chesapeake Bay, astounding scientists and creating a resurgence of one of the most important commercial and recreational fisheries on the East Coast. Striped bass migrate all along the Atlantic Coast, and most spawn in the tidal waters of the Chesapeake Bay, the nation's largest estuary.

Today's optimism stands in sharp contrast to the devastating conditions facing the Atlantic striped bass a decade ago. At that time, overharvesting and pollution led to a near collapse of the fishery and forced federal and state lawmakers to impose fishing restrictions. Notably, in 1984, Congress passed the Atlantic Striped Bass Conservation Act which allowed the Atlantic States Marine Fisheries Commission to develop a coastwide management plan to restore the striped bass. The plan called for severely restricted harvesting of the fish all along the Atlantic Coast, from Maine to North Carolina. Maryland took action within its fishing waters, imposing a five-year moratorium on harvesting striped bass beginning in 1985. Virginia followed suit in 1989. By 1990, promising signs of rebounding hatches allowed both states to lift their moratoria and the commission to ease its restrictions. Three years later, the number of young striped bass was the largest ever recorded. By 1994, the striped bass was declared a recovered resource, although special regulations are still in effect to ensure the fishery's long-term health.

The plan's success rested on the cooperation among commercial and recreational fishermen along the Atlantic seaboard, states and the federal government, and agencies within the federal government. The interagency, interstate cooperative approach taken is now considered a model for other fishery management plans. Says Bill Matuszeski, director of the U.S. Environmental Protection Agency's Chesapeake Bay Program Office, "It is a great example of how coordinated fisheries management, increased habitat, and improved water quality can bring an important fish species back from the precipice to an economically and ecologically restored state."

Strengthening National Natural Resources Information

Information on the current condition of natural resources and related trends is vital to measuring national and site-specific progress toward sustainability. There are already numerous sources of natural resources data collected by many different government agencies, communities, tribes,

private landowners, and others. Much of the information, however, is not readily accessible to public and private policymakers, managers, or interested citizens because it exists in different formats at different locations. The situation impairs the ability to monitor and assess long-term effects of management actions and to evaluate sustainability. This problem is particularly acute in the case of baseline data.

As discussed in chapter 3, "Information and Education," it is essential to make data more accessible, to make better use of the data now available, and to move toward compatibility of data from numerous sources. While actions to protect and restore ecosystems need to occur as more complete data are gathered, comprehensive inventory and assessment of the nation's renewable and nonrenewable natural resources and bio-diversity are equally essential. These data can help provide a sound comprehensive basis for informing public and private natural resources decisions.

Many initiatives are aimed at improving compatibility and accessibility of natural resources data, including information that is comparable in terms of geographic and temporal scales in the computer-based analysis methods used. For example, interagency, regionwide ecosystem assessments are being conducted in the Pacific Northwest, the upper Columbia River Basin, the Sierra Nevada region of California, and the southern Appalachians. These efforts should be continued and expanded to include other regions.

Federal and state agencies and tribes can play an important leadership role by collaborating in the development of methods and protocols for data collection, analysis, display, and access. It is useful to build on past experience, such as the national natural resources surveys conducted for the past 20 years by USDNs Natural Resources Conservation.

Service and Forest Service, and by the U.S. Fish and Wildlife Service. The national natural resources surveys and regionwide ecosystem assessments focus primarily on generic resource categories.[24]

In addition, there is the national network of Natural Heritage Programs which provides more detailed information on the distribution and abundance of plant and animal species and types of ecosystems. This network of state databases is the product of 20 years of partnership efforts involving state government agencies and The Nature Conservancy. The resulting Heritage Network offers a comprehensive source of data on biological diversity and is a useful complement to other resource databases.

The long-ten-n goal for strengthening national natural resources information is to bring about better strategic and operational decisions at all levels of government and the private sector based on reliable, high-quality information that integrates economic, environmental, and equity considerations.

POLICY RECOMMENDATION 7

NATURAL RESOURCES

federal, state, and tribal natural resources and biodiversity inventories, assessments, and databases; and by developing and using compatible standards, methods, and protocols.

ACTION 1. Federal and state natural resources agencies should convene planning sessions among all stakeholders to agree on data and information uses, standards, and methodologies for collecting data and conducting assessments of the nation's biodiversity and natural resources stocks, and the formats for reporting such data and information.

ACTION 2. Federal and state natural resources agencies and private institutions can intensify efforts to collect inventory data, involving contractors, volunteers, and others in the process, and applying agreed-upon collection and reporting standards and methodologies.

ACTION 3. Federal and state natural resources agencies should establish accessible and useful data repositories.

ACTION 4. All those involved in collecting and reporting natural resources inventories can coordinate to develop indicators of sustainability and indices showing the status of efforts to achieve the sustainable use of resources.

ACTION 5. Natural resources managers can monitor their management practices on a voluntary basis. Independent third-party verification of biodiversity assessments and sustainable practices may also prove valuable.

ACTION 6. The federal government should support data collection and analysis efforts for migrating species that breed in the United States but winter in other countries.

Creating Partnerships for Conservation

In areas that lie between densely populated urban land and protected wildlands, the interaction between people and their environment is critically linked to the protection of biological diversity and environmental quality for future generations. Owners of private property in these semi-natural areas are important participants in preserving biodiversity and creating sustainable economies. Future economic and ecological prosperity will depend to a significant degree on the

ability to recognize and support the role that private landowners, in partnership with public and private conservation organizations, can play in promoting natural resources stewardship. Additionally, effective stewardship of biodiversity conservation can help prevent species declining to the point of endangerment and being listed under the Endangered Species Act.

Private voluntary partnerships can complement efforts under the existing system of laws that safeguard the environment and public and private protected lands, including conservation areas and preserves that provide an important measure of biodiversity protection across the country. The ability of future generations to make a living in these areas will be influenced by the extent to which private owners' efforts to conserve the landscape receive recognition and support.

Voluntary partnerships for conservation will benefit by drawing on three principles: sharing the lessons already learned about conservation on private lands, recognizing the successful efforts of those who have taken steps on their own property to demonstrate natural resources stewardship, and creating incentives that assist landowners in developing conservation strategies. Conservation easements, land exchanges, and transfer of development rights are types of mechanisms that can recognize the economic concerns of the landowner and the common goal of conservation. Use of these tools as a part of voluntary partnerships can help ensure that ecologically sensitive lands receive a measure of protection, complementing the nation's system of public and private protected areas, conservation areas, and preserves.

"THEY DIDN'T EXPECT APPLAUSE"

When Fred Annand and Al Hopkins mode their presentation to a room filled with senior managers from The Nature Conservancy and Georgia-Pacific Corporation, they expected a long day of negotiations ahead. They were prepared for tense moments and heated debates. They anticipated high-energy discussions. What they did not expect was applause.

Fred Annand is a conservation manager in the North Carolina office of The Nature Conservancy. Al Hopkins is a senior forest resource manager for Georgia-Pacific. Their proposal called for the two organizations to manage 21,000 acres along North Carolina's lower Roanoke River, one of two remaining large forested wetlands on the southern Atlantic Coast. The area teems with deer, wild turkey, black bear, bold eagles, and bobcats and provides a resting ground for migratory songbirds, herons, egrets, and some 210 other bird species.

Annand compares the venture to navigating through uncharted waters. "This is a new arrangement for us. Georgia-Pacific will own the land, but all of the management activities, including timber harvesting on the seven tracts along the river, will be agreed upon by a joint ecosystem management committee." Hopkins reflects on the worm reception their idea received from both organizations. "We asked the group what they thought. They responded with a round of applause. That was a first for me, and I could tell by Fred's look that he was just as surprised."

On November 14, 1994, The Nature Conservancy Chairman John Sawhill and Georgia-Pacific Chairman Pete Correll, both members of the President's Council on Sustainable Development, agreed to implement the plan. Sawhill thought it made good sense: "We are very excited about this partnership. We believe in cooperative conservation. The Roanoke agreement is a prime example of how industry, private groups, and the government can work together." Bruce Babbitt, secretary of the U.S. Department of the Interior and a Council member, also praised the agreement, calling it "unprecedented, setting a new course for forest management. The importance of this agreement is that it proves that a forest products company and conservation interests can develop hands-on management partnerships."

Representatives from the U.S. Fish and Wildlife Service and scientists from North Carolina State University are members of the management team. Some tracts of the 21,000 acres will be deemed high priority because of their special ecosystems. On these lands, Georgia-Pacific has agreed to relinquish its timber harvesting rights. On other tracts, timber harvesting will take place, following methods agreed to by the joint management team.

Correll sees the partnership as an important part of the company's corporate mission. "I view sustainable development not only as a mandate for wise environmental and resource stewardship, but also as a responsibility to sustain a way of life. The Roanoke project is a good example of this. It's definitely a step in the right direction."[25]

POLICY RECOMMENDATION 8

BIODIVERSITY CONSERVATION

Create voluntary partnerships among private landowners at the local and regional levels to foster environmentally responsible management and protection of biological diversity, with government agencies providing incentives, support, and information.

ACTION 1. The federal government should provide incentive grants to landowners who act to protect and manage habitat for native species.

ACTION 2. Federal, state, and local tax laws, including estate and inheritance tax laws, should encourage private landowners to protect biodiversity by managing lands for conservation, improving degraded habitat, or donating land into protected status.

ACTION 3. State, regional, and local authorities can provide incentives to private landowners by targeting the use of bonds to finance the purchase, or protection through easements, of lands with significant natural value that are most threatened by incompatible uses. These funds should be used to capitalize trusts for protected areas, quasi-governmental conservancies, or other land funds wherever possible.

ACTION 4. State and local land trusts and conservancies can develop covenants among cooperating owners to maintain the long-term health and integrity of ecosystems. State and local land trusts and conservancies can enlist the cooperation of landowners in sustainable management patterns.

ACTION 5. Voluntary regional or watershed landowner councils can be formed to promote information sharing and cooperation.

ACTION 6. The federal government should recognize and encourage these efforts by creating partnerships with nonprofit organizations.

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[1] U.S. Department of the Interior, Bureau of Land Management, *Ecosystem Management in the BLM: From Concept to Commitment*, BLM/SCGI-94/005-1736 (Washington, D.C., 1994), p. 2.

[2] U.S. Department of Commerce, *Statistical Abstract of the United States 1994* (Washington, D.C.: Government Printing Office, 1994), p. 225, table 354.

[3] U.S. Department of Agriculture, Natural Resources and Environmental Division, Economic Research Service, *AREI Updates: Land Trusts, No. 13* (Washington, D.C., 1995).

[4] The Conservation Reserve Program was established by the Food Security Act of 1985, Title XII, Pub. L. 99-198, 99 Stat. 1354.

[5] Interagency ecosystem Management Task Force, *The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies -- Volume II -- Implementation Issues* (Washington, D.C.: U.S. Department of Commerce, 1995), pp. 110-11; and U.S. Department of Agriculture, Natural Resources Conservation Service, *Summary Report, 1992 National Resources Inventory Graphic Highlights* (Washington, D.C., 1995), p. 1.

[6] U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, *Fifty Years of Population Change Along the Nation's Coasts, 1960-2010* (Washington, D.C., 1990), p. 41.

[7] Government Performance and Results Act of 1993, 31 U.S.C. 1115-19 (1995).

[8] Federal Advisory Committee Act, 5 U.S.C. Ap.2 (1994).

[9] See U.S. Department of Commerce, National Oceanic and Atmospheric Administration, *Habitat Protection Activity Report 1991-1993* (Silver Spring, Md., 1994); and *Proposed Recovery Plan for Snake River Salmon* (Seattle, 1995).

[10] See *Statistical Abstract of the United States 1994*, p. 225, table 354.

[11] Endangered Species Act, 16 U.S.C. 1531 et seq. (1982); and Bruce A. Stein et al., "Status of U.S. Species: Setting Conservation Priorities," in U.S. Department of the Interior, National Biological Service, *Our Living Resources -- A Report to the Nation on Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecological Systems* (Washington, D.C., 1995), pp. 399-400.

[12] Douglas S. Powell et al., no. 234 (Fort Collins, Colo.: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experimentation Station, 1994), p. 132.

[13] T. Alexander Majchrowicz and Jacqueline Salsgiver, "U.S. Farm and Farm-Related Employment in 1991," *Agriculture Information Bulletin*, no. 714 (Washington, D.C.: U.S. Department of Agriculture, Economic Research Service, April 1995), p. 1.

[14] U.S. Department of Agriculture, Economic Research Service, *Agricultural Resources and Environmental Indicators*, no. 705 (Washington, D.C., 1994), pp. 1-16.

[15] U.S. Environmental Protection Agency, Office of Water, *National Water Quality Inventory, 1992 Report to Congress* 841-R-94-001 (Washington, D.C., 1994).

[16] U.S. Department of Agriculture, Natural Resources Conservation Service, *Summary Report, 1992 -- National Resources Inventory* (Washington, D.C., 1994), p. 5.

[17] U.S. Department of Agriculture, National Agricultural Statistical Survey, *U.S. Number of Farms 1910-1993* (Washington, D.C.).

[18] U.S. Department of Agriculture, Natural Resources Conservation Service, *National Resources Inventory: Graphic Highlights of Natural Resources Trends in the United States Between 1982 and 1992* (Washington, D.C., 1995), p.3.

[19] Food Security Act of 1985; Agricultural Reconciliation Act of 1990, Pub. L. 101-508, 104 Stat. 1388; and Farmland Protection Policy Act, 7 U.S.C. 4201 et seq. (1982).

[20] *Forest Resources of the United States*, 1992.

[21] Information presented by Eldon Ross, associate deputy chief for research for the U.S. Forest Service, to the Second Ministerial Conference on the Protection of Forests in Europe, Helsinki, Finland, 16-17 June 1993, p. 4.

[22] Scott Wallinger, "A Commitment to the Future American Forest and Paper Association Sustainable Forestry Initiative," *Journal of Forestry* 93, no. 1 (January 1995): 16-19.

[23] See W. Nehlsen, J.E. Williams, and J.A. Lichatowich, "Pacific Salmon at the Crossroads: Stocks at Risk From California, Oregon, Idaho, and Washington," Fisheries 16, no. 2 (1991): 4-21; *Habitat Protection Activity Report 1991-1993*; and *Proposed Recovery Plan for Snake River Salmon*.

[24] U.S. Department of Agriculture, Natural Resources Conservation Service, 1992 *National Resources Inventory Backgrounder* (Washington, D.C., 1995).

[25] For more information, see The Nature Conservancy, "The Nature Conservancy, Georgia-Pacific Corporation Form Pact to Protect Significant Watershed in Eastern U.S.," press release (Arlington, Va., 14 November 1994).

Chapter 6

U.S. Population and Sustainability

Population growth, especially when coupled with current consumption patterns, affects sustainability. A sustainable United States is one where all Americans have access to family planning and reproductive health services, women enjoy increased opportunities for education and employment, and responsible immigration policies are fairly implemented and enforced.

The previous chapters of this report have addressed the various economic, environmental, and social implications of how people individually and collectively use resources in the United States. This overarching issue of consumption appears throughout the report -- from our recommendations related to extended product responsibility and the use of market mechanisms to the development of sustainable communities, collaborative natural resources management systems, and an individual stewardship ethic. Understanding and addressing the unsustainable aspects of the nation's production and consumption patterns are essential to achieving the goals outlined in this report. But clearly, human impact on the environment is a function of both population and consumption patterns. It is possible for more people to have a smaller impact but only if -- through changes in lifestyle or technological progress -- each person uses fewer resources and produces less waste. Even if technological progress reduces the rate at which the United States uses resources and generates waste on a per capita basis, population growth will make the objective of sustainable development more difficult.

With a population of more than 261 million, the United States is the third largest country in the world. As a result of natural increase, defined as the difference between births and deaths, and immigration, the U.S. population is growing by 3 million people each year, or 1 percent annually -- more than twice the annual growth rate in most of Europe and in most industrialized countries, but far less than in developing countries. The U.S. Census Bureau projects that if current demographic trends persist, the U.S. population will reach 350 million people by the year 2030, and almost 400 million by the middle of the 21st century. [1] To put these numbers in perspective, under current trends, the United States is adding the equivalent of Connecticut's population every year and of California's every decade.

Production and consumption in the United States together form the critical link between population and sustainability. National quality of life derives in large part from the unprecedented scale of U.S. production and consumption. Production and consumption account

for the throughput, or total mass of materials and energy that is used and makes its way through the economy, resulting in a U.S. gross domestic product (GDP) of more than $6.4 trillion in 1994. [2]

This high standard of living is also reflected in a high level of consumption -- a level amplified by growth in population. The United States consumes more than 4.5 billion metric tons of materials annually to produce the goods and services that make up its unparalleled economic activity. (See figure 12.) One example of U.S. consumption patterns can be found in the energy sector. The United States has 5 percent of the world's population but accounts for approximately 25 percent of global energy use on an annual basis. There is greater opportunity for improvements in energy efficiency in the United States than in other industrialized nations; U.S. energy use per unit of GDP is approximately 36 percent greater than in Germany and 79 percent greater than in Japan. Use of petroleum feedstocks is seven times the world's per capita average. In 1994, the United States used 19.9 million barrels of oil per day, while the remaining 24 Organization for Economic Cooperation and Development countries collectively used 23.8 million barrels per day. The United States is also the world's leading producer of garbage and industrial wastes. [3]

There is nothing inherently wrong with a population -- even a large one -- meeting its material needs by consuming resources and creating wastes. Problems arise when the numbers of people and the scale, composition, and pattern of their consumption and waste generation combine to have negative effects on the environment, the economy, and society. Together, the size of the population and the scale of consumption impinge significantly on American society's ability to achieve sustainability. There is relatively little concrete information about the long-term consequences of choices made by consumers, but such information will be essential in order to change patterns of consumption in the United States; it should be developed and made available.

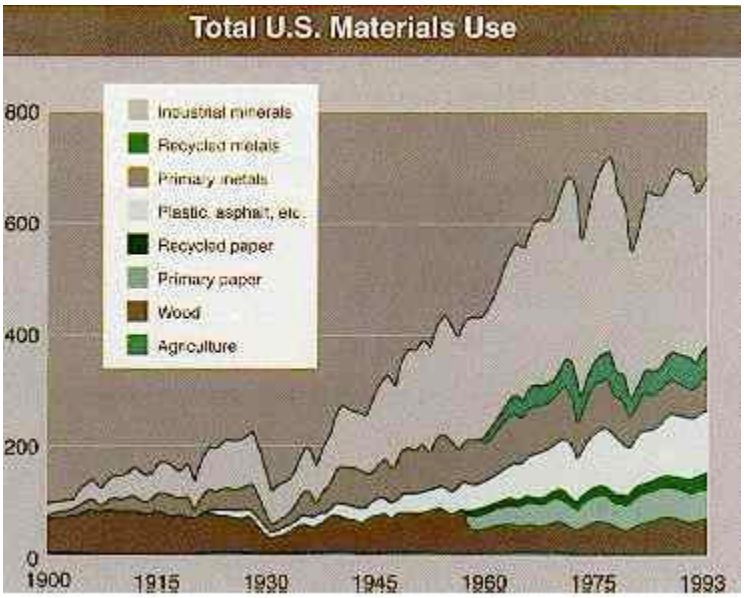
Because the United States has the world's third largest population and the largest economy, with an unparalleled scale of per capita consumption and waste generation, even slight changes in U.S. consumption patterns or population size can have a significant impact on sustainability. Annual per capita gains in reducing wastes, improving resource efficiency, and promoting economic growth must exceed I percent to translate into real reductions in environmental impact and real growth in the American standard of living. Thus, unless some technological change substantially reduces the scale of resources needed to maintain the current quality of life in the United States, continued population growth steadily makes more difficult the job of mitigating the environmental impact of American resource use and waste production patterns. Based on current trends, efficiency in the use of all resources would have to increase by more than 50 percent over the next four or five decades just to keep pace with population growth.

Managing population growth, resources, and wastes is essential to ensuring that the total impact of these factors is within the bounds of sustainability. Stabilizing the population without changing consumption and waste production patterns would not be enough, but it would make an immensely challenging task more manageable. In the United States, each is necessary; neither alone is sufficient.

Sustainable development explicitly recognizes the obligation of the current generation to future generations. Taking this obligation seriously means examining the difficult issues and hearing divergent views to make informed decisions about what best serves the interests of America. As recognized at the International Conference on Population and Development in Cairo in 1994, all nations have responsibility for managing population growth. The United States must provide leadership by setting an example.

Involving as it does such difficult issues as personal childbearing decisions, contraceptive methods, teenage sexual behavior, and the high rate of abortion in America, as well as legal and illegal immigration trends, the subject of U.S. population growth is complex and controversial. It raises a variety of moral and ethical concerns. The Council believes that these issues can be approached forthrightly and must be addressed with great care, full respect, and in a way that is consistent with the various religious and ethical values and cultural backgrounds of the American people. The discussion and recommendations in this chapter focus on family planning, personal responsibility, and voluntarism. The Council has not discussed nor do its recommendations relate to or take a position on the issue of abortion.

Figure 12



On the issue of population, the emphasis of the Council's recommendations is on enabling parents to decide freely and responsibly the number and spacing of their children, based on the strongly held and unchallenged conviction that voluntary decision-making lies at the heart of all American family planning. The Council also recognizes that the issue of immigration is potentially explosive and urges that legal and illegal immigration be addressed with great sensitivity and recognition of long-standing American traditions of fairness, freedom, and asylum. Finally, while the Council encourages realization of its goals and recommendations throughout America, it wants to make clear that it seeks to move toward voluntary population stabilization at the national level, recognizing that the population of any state or region will ebb and flow according to the choices of individuals and families about where to live and work.

This report as a whole covers various aspects of consumption in the United States -- from the recommendations on extended product responsibility and sound fiscal policies to the promotion of sustainable communities and encouragement of collaborative approaches to managing natural resources. Because much of the report deals with issues involved in responsible consumption, this chapter recommends complementary policies that would move the United States toward voluntary population stabilization and sustainable development.

Expanding Reproductive Health Services

Simply addressing and ensuring access to basic reproductive health needs, such as family planning, education, and pre- and post-natal care, would move the United States toward population stabilization. Indeed, failing to do so partly explains why 60 percent of all pregnancies in the United States are unintended. [4] High rates of unintended pregnancy contribute to a higher rate of natural increase (excess of births over deaths); this in turn adds

significantly to U.S. population growth. In 1992, the U.S. population grew by nearly 2 million due to natural increase. [5]

Unintended pregnancies are associated with higher rates of low birth weight and infant mortality, high rates of abortion, increased need for welfare, more teens forgoing education, and more children raising children -- all of which contribute to the deterioration of American families. These pregnancies affect people in all socioeconomic strata but are most common among younger and poorer women. National family planning efforts are critical to preventing unintended pregnancies before they occur and to achieving national health and social aims. Currently, the principal program providing comprehensive public family planning services to low-income women and men is under Title X of the Public Health Service Act of 1970. [6] Title X does not provide funding for abortion. The family planning services it does provide are estimated to prevent an average of 1.2 million unintended pregnancies and about half that number of abortions a year. [7]

The nation's family planning assistance efforts -- whether under Title X or any other program -- must provide education and outreach to prevent unintended pregnancies. In general, reproductive health services are targeted to women, but outreach needs to include men as well, so they can play an equal role in safeguarding their own reproductive health and that of their partner and in making sound family planning and contraceptive choices. Years of experience with Title X and other subsidized family planning programs show that few men use these services without special outreach, counseling, education, and other efforts to make them feel at ease. Special programs should reach young men before they become sexually active to help them build the skills and strategies needed for sexual health and responsibility. Clearly, the importance of the relationship between national family planning assistance efforts and population must be recognized as the nation goes forward. For example, funding for Title X fell by more than 70 percent in real dollars between 1980 and 1992 and has not been reauthorized by Congress since 1984. [8] Because of this, the ability of Title X to provide services to high-risk individuals and underserved or hard-to-reach populations becomes problematic. Reducing unintended pregnancies in the United States depends on the empowerment and participation of both men and women.

Public and private health insurance coverage of comprehensive reproductive health services is another essential means of preventing unintended pregnancies. For example, Medicaid is the largest public funder of family planning services, but because eligibility is tied to welfare eligibility, fewer than half of poor women are covered by Medicaid. In 1986, the federal government expanded Medicaid coverage to pregnant women and infants with incomes 133 percent of the poverty level, regardless of whether they meet other welfare requirements. But coverage under this extension does not include family planning services until after childbirth, and then only for 60 days. Thus, Medicaid in its current form is not an effective source of services for preventing first pregnancies among these women, nor for ensuring that future pregnancies are planned ones.

As noted above, the rate of unintended pregnancies is higher among poor and low-income women, but women from all social and economic backgrounds experience unintended pregnancies. Therefore, private insurance coverage for reproductive health services also needs to be considered in examining the effectiveness of services to women for the prevention of unintended pregnancies. Almost two-thirds of women of reproductive age in the United States do not rely on publicly provided family planning because they have insurance provided through employment in the private sector. But private insurance does not uniformly offer adequate coverage for family planning services. Up to 85 percent of insurance policies and health maintenance organizations cover sterilization and abortion, but fewer than half of typical plans cover the major reversible contraceptive methods: in fact, these methods are covered by only 15 percent of plans. [9] Expanding private insurance to cover the full range of reproductive health services should be explored.

In summary, then, an effective way to reduce the number of unintended pregnancies and births in the United States is to expand access to family planning, education, and related reproductive health services, particularly for at-risk individuals. Family planning is highly cost-effective compared with the social and public costs of unintended pregnancy, and it helps ensure that every child is a wanted child.

POLICY RECOMMENDATION 1

GREATER ACCESS TO AND AVAILABILITY OF SERVICES

Expand access to and availability of the family planning and reproductive health services needed to prevent unintended pregnancies and ensure that all Americans have the information and services they need to decide freely and responsibly the number and spacing of their children.

ACTION 1. Congress should authorize and sufficiently fund national family planning programs to ensure that all women and men, regardless of income, have access to family planning and related reproductive health care options. In addition, these efforts should be strengthened to enhance information, education, and outreach capabilities -- particularly for men and underserved or hard-to-reach populations.

ACTION 2. Through families, social institutions, and community-oriented, peer-based, and adult-mentoring programs, education can be increased and appropriate services provided for adolescents. Programs can be initiated to encourage parents and other caregivers to fulfill their role as the primary provider of values and information. Abstinence and strategies for discouraging adolescents from engaging in sexual activity can be encouraged. In addition, access to appropriate services should be provided to adolescents who are sexually active.

ACTION 3. The public and private sectors can reform health insurance coverage to ensure that all recipients are afforded choices among the broadest range of safe, voluntary reproductive health services. The Medicaid program also should be reformed to help ensure that recipients

who become eligible as a result of pregnancy have access to family planning services for an extended period after birth to encourage birth spacing and discourage future unintended pregnancies.

ACTION 4. Congress should fund -- through federal medical research laboratories, public-private partnerships, and other innovative arrangements -- increased research in both basic and applied reproductive health sciences, including research on alternative birth control technologies to expand the range of medically safe contraceptives available to women and men. Particular attention should be given to women-controlled barrier methods and methods that protect against sexually transmitted diseases, post-ovulatory methods, and improved male methods. Consideration also should be given to strategies that address product liability concerns that impede contraceptive research and product development by the private sector.

Teens Teaching Teens

Approximately 30 percent of America's 15-year-olds have had sexual intercourse at least once. At age 78, the percentages are 56 for girls and 73 for boys. [10] Effective teen pregnancy prevention programs should encourage teens to abstain from sexual activity, equip them to behave responsibly, and provide appropriate services. Such programs can be school-based, they should educate young people in reproductive health, contraception, and sexuality; they should involve males as well as females; and they should be built on successes demonstrated around the country. At the some time, the elements of successful teenage pregnancy prevention programs need to be better understood. As important as the promotion of abstinence is to preventing teen pregnancy, it cannot be the only strategy.

The key to one of the most successful pregnancy prevention programs in the United States is Teens Teaching Teens. Started in 1985 by the Atlanta public schools and the Grady Health System, the program has helped hundreds of Georgia teenagers avoid unwanted pregnancies.

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Each summer, some 60 juniors and seniors from the Atlanta public schools train to become student leaders in the Grady Health System program. Then, for five sessions during eighth-grade health classes, the older teens encourage the younger ones to postpone sex. Marie Mitchell, program manager for teen services at the Grady Health System, says, "It's so successful because it's a teenage-led series. Peer support is created for the notion that you don't need to be sexually involved. Teens provide models to other teens showing that it is something you can do."

Eighty-three percent of all teenagers giving birth come from families who live below the poverty line, the Council was told during a task force roundtable discussion.[11] Yet the Atlanta program "manages to reach even the hardest of hard-to-reach youth," according to Mitchell. A Ford Foundation study confirms that students from low-income families who participate in the Atlanta program are less likely to be sexually active than those who do not participate. By the senior year of high school, although participants' abstinence rates drop, their use of birth control practices is significantly higher than among those students that did not participate in the program.

While the program's purpose is to reach younger students, the student teachers, who are former participants in the program, also learn from their experience. Notes Mitchell, "Not only does it help them manage their own sexuality, it also helps them develop more confidence, leadership skills, and public speaking experience."

Dealing With Socioeconomic Conditions

Poverty and the lack of economic, educational, social, and political opportunities are important influences on early and unintended childbearing. Confidence that one can get a job, as well as other factors that help determine one's sense of hope and self-worth, are powerful determinants in teen decisionmaking about childbearing. While unintended pregnancies occur at all incomes, poor women -- both as teenagers and as adults -- experience a higher proportion of unintended pregnancies because of lack of access to services and lack of opportunity and autonomy of various kinds. Unintended pregnancy often becomes yet another unfortunate consequence of poverty. Women shoulder more than half of the burden of poverty in the United States; almost two-thirds of the adult poor are women; and more than half of all poor families are headed by a single mother.[12] These facts demonstrate the need to deal with broad social conditions such as poverty that contribute to unintended pregnancy, and, in turn, to the relatively high rates of adolescent pregnancy and population growth in the United States compared with other industrialized countries.

The Council recommends that both the public and private sectors endeavor separately and in partnership to deal with socioeconomic conditions that are closely related to high rates of teen and unintended pregnancy. The public sector has a role to play in developing laws and regulations to level the playing field in society, encouraging greater equity, and enhancing opportunities for disadvantaged Americans. The private sector can play an important role by voluntarily taking the initiative to break down barriers to women's advancement in the workplace. In addition, by providing jobs, employment training, and economic opportunity, as it does in the normal course of business, the private sector can create opportunity for disadvantaged segments of society. Finally, all Americans -- as parents, community members, and civic leaders -- have roles to play in promoting personal responsibility and common values, which will also support stronger families. Following are representative strategies offered by the Council for realizing these objectives.

POLICY RECOMMENDATION 2

EXPANDED OPPORTUNITIES FOR WOMEN	**ACTION 1.** National, community, and religious leaders can foster in all Americans the shared values involved in personal responsibility and the strengthening of the family, the most important unit of society.
Create partnerships to enhance opportunities for women, giving special attention to socioeconomic factors that result in disproportionately high levels of unintended and teen pregnancy among disadvantaged	**ACTION 2.** The public and private sectors should work in partnership to ensure that women are not disadvantaged by decisions to bear and raise children, in terms of educational, employment, and professional opportunities and advancement. **ACTION 3.** Opportunities for women to participate in political and leadership positions should be expanded at all levels of society, in both the public and private sectors. **ACTION 4.** The public and private sectors should expand

segments of society.

opportunities for women to participate in the workplace, ensuring pay equity, enhancing the availability of capital for women-owned enterprises, and promoting women into leadership positions in business.

ACTION 5. The public and private sectors should enhance efforts to provide educational, economic, and social opportunities for women, particularly teens.

ACTION 6. The public and private sectors and religious community can encourage innovative community and peer-based counseling efforts for disadvantaged youth and women to encourage these at-risk groups to abstain from early sexual activity and realize their full economic, educational, and social potential.

ACTION 7. The public sector and religious community can encourage ment to take greater responsibility in child-rearing and family life.

NEW ECONOMICS FOR WOMEN

Casa Lama is an apartment complex located in one of the poorest sections of downtown Los Angeles. It is also the site of the cornerstone project of New Economics for Women (NEW),a nonprofit development corporation fully owned and operated by women dedicated to improving the lives of poor single parents and their families.

When Anna Rodriguez, a single parent of four boys aged two to 14, arrived at Casa Loma, she was on welfare and sewed at home to supplement her income. Weary of being dependent, Rodriguez, with support from the Casa Loma project, first obtained a minimum-wage job as a seamstress in a nearby shop. Then she heard about a new garment factory opening in the San Fernando Valley, 30 miles away. Despite the distance, she went to pick up an application, but was told it was too late; the deadline had passed. The Casa Loma director made a telephone call on her behalf. The following Monday, Rodriguez reported to work as an $8.50-an-hour seamstress. Just two weeks later, she was promoted to second designer at $20 an hour.

"Casa Loma has been an incredibly successful public-private partnership because we have facilitated and strengthened opportunities for women to empower themselves," says Beatriz Olvera Stotzer, NEW president and founder. "Anna is a perfect example of empowerment. She was afraid of leaving her children at home for fear she would not be a good mother and was ashamed of being on welfare. We provided the environment and assistance for her to empower

herself.”

The Casa Loma project, wich relies on private donations as well as public funds, combines housing with an aggressive agenda of on-site educational, social, and business programs. The programs focus on matters that deeply affect impoverished families: infant and child care in a safe environment; after-school activities for latchkey kids; training for adults and children in areas ranging from adult literacy to word processing and mathematics; and life skill courses in budgeting, finance, job placement assistance, and micro-enterprise development. Parenting magazine gave NEW and the Casa Loma project its 1994 Parenting Achievement Award for making the world a better place for children. The U.S. Department of Housing and Urban Development considers Casa Loma a national housing model for the 21st century.

Improving Immigration Strategies

The United States is a nation of immigrants. Today, addressing immigration is an important aspect of the broad question of population stabilization in this country. Immigration accounts for one-third of total U.S. population growth and is a factor that must be addressed in the overall effort to stabilize population voluntarily.[13] Because new immigrants typically have high fertility rates, immigration will be a powerful factor in future population growth.[14]

Through the Immigration Act of 1990, Congress established the U.S. Commission on Immigration Reform to review immigration issues and strategies.[15] The commission has initiated a comprehensive review of current U.S. immigration policy; the review should be complete by the end of 1997. The thrust of the commission's work has been consistent with the Council's beliefs that policymaking in the United States should aim toward participatory, collaborative, and reasoned decisionmaking.

The Council has not examined the full range of difficult and sensitive issues associated with immigration in the United States. Little information on the effects of immigration on various aspects of American society and sustainable development is available. The Council supports the kind of expert, participatory process established by Congress to address immigration matters. We also support the creation of policies that recognize both the nation's historic acceptance of immigrants as well as the need to limit population growth. In this context, there is broad agreement that one of the most undervalued strategies related to immigration involves the promotion of broadly based international policies-- such as trade and international economic policy, foreign policy, and international environmental policy -- to address economic, political, and social conditions that influence an individual's decision to emigrate.

POLICY RECOMMENDATION 3

IMPROVED IMMIGRATION POLICIES

Encourage the Commission on Immigration Reform to continue its work, and support research to promote the implementation and fair enforcement of responsible immigration policies.

ACTION 1. Congress and the relevant federal agencies should review and address the appropriateness of recommendations presented by the Commission on Imigration Reform with respect to American traditions of fairness, freedom, and asylum as well as the aim of sustainable development. Priority attention should be given to implement and enforce national policies on illegal and legal immigration policy.

ACTION 2. The federal government should fund research on the environmental and economic effects of migration to the United States and population growth in general to inform immigration and other demographic policies.

ACTION 3. U.S. foreign policy and international economic policy should deal comprehensively with the causes of migration to the United States. An effective strategy to prevent unlawful migration should be based on international policies that directly or indirectly address the factors that encourage people to leave their home countries, including lack of employment; poor working conditions; political, social, and religious oppression; and civil conflict.

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[1] Population data are from U.N. Department for Economic and Social Information and Policy Analysis, *World Population Prospects - 1994 Revision* (New York: United Nations, 1995), pp. 103-04, table 50; U.S. Department of Commerce, *Statistical Abstract of the United States 1994* (Washington, D.C.: Government Printing Office, 1994), p. 9, table 4; U.N. Conference on Environment and Development, *United States of America National Report* (Washington, D.C.: Council on Environmental Quality, 1992), p. 26; and Jennifer Cheeseman Day, *Population Projects of the United States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2050*, U.S. Department of Commerce, Bureau of the Census, Current Population Report (Washington, D.C.: Government Printing Office, 1993), table 1.a.

[2] *Statistical Abstract of the United States 1994*, p. 446.

[3] General consumption data are from World Resources Institute, *World Resources 1994-95*, prepared in collaboration with the U.N. Environmental Program and the U.N. Development

Program (New York: Oxford University Press, 1994), p. 15. Energy consumption data are from U.S. Department of Commerce, Bureau of the Census, *World Population Profle: 1994* (Washington, D.C.: Government Printing Office, 1994), p. 9, fig. 6; and U.S. Department of Energy, Energy Information Association, *International Energy Annual: 1993*, DOE/EIA-0219(93) (Washington, D.C.: Government Printing Office, 1995), p. vii. International comparisons are from Organization for Economic Cooperation and Development, *OECD Environmental Performance Review* -- Netherlands (Paris, 1995), p. 69, fig. 3.4; *World Resources 1994-95*, p. 16, table 1.9, and p. 341, table 21.6; and U.N. Environment Program, *Environmental Data Report 1993-94* (Oxford: the Alden Press, 1993), pp. 347-48, table 8.2.

[4] Institute of Medicine, *The Best Intentions: Unintended Pregnancy and the Well-Being of Children and Families*, S. Brown and L. Eisenberg, eds. (Washington, D.C.: National Academy Press, 1995).

[5] Data derived by subtracting deaths from births using vital statistics compiled by the National Center for Health and Human Services in 1992. See U.S. Health and Human Services, "Advance Report of Final Mortality Statistics, 1992," *Monthly Vital Statistics Report* 43, no. 6 (Hyattsville, Md.: National Institute for Health Statistics, 1994); and U.S. Health and Human Services, "Advance Report of Final Natality Statistics, 1991," *Monthly Vital Statistics Report* 43, no. 5 (Hyattsville, Md.: National Institute for Health Statistics, 1994).

[6] Public Health Service Act of 1970, 42 U.S.C. Subchapter VIII, Title X, 300 et seq. (1988).

[7] The Alan Guttmacher Institute, "The U.S. Family Planning Program Faces Challenges and Change," Issues in Brief (Washington, D.C., 1995).

[8] D. Daley and R. Gold, "Public Funding for Contraceptive, Sterilization, and Aborton Services, Fiscal Year 1992," *Family Planning Perspectives* 25, no. 6 (December 1993): 248; and "The U.S. Family Planning Program Faces Challenges and Change."

[9] The Alan Guttmacher Institute, *Uneven and Unequal: Insurance Cover and Reproductive Health Service* (Washington, D.C., 1994).

[10] The Alan Guttmacher Institute, *Sex and America's Teenagers* (Washington, D.C., 1994), p. 20.

[11] Information presented by Jacqueline Forrest of The Alan Guttmacher Institute to the President's Council on Sustainable Development, Population and Consumption Task Force, Roundtable Discussion on Fertility and Migration, The George Washington University, Washington, D.C., 27 October 1994.

[12] Patricia Donovan, *The Politics of Blame: Family Planning Abortion and the Poor* (Washington, D.C.: The Alan Guttmacher Institute, 1995), p.9.

[13] *Statistical Abstract of the United States 1994*, pp. 9-10, tables 4-6.

[14] Information presented by jennifer Day of the U.S. Bureau of the Census to the President's Council on Sustainable Development, Population and Consumption Task Force, Rountable Discussion on Fertility and Migration, the George Washington University, Washington, D.C., 27 October 1994.

[15] Immigration Act of 1990, Pub. L. 101-649, 104 Stat. 4978.

Chapter 7

International Leadership

The United States has both reason and responsibility to develop and carry out global policies that support sustainable development. Because of its history and power, the United States is inevitably a leader and needs to be an active participant in cooperative international efforts to encourage democracy, support scientific research, and enhance economic development that preserves the environment and protects human health.

THE FUTURE OF the United States - its security, its prosperity, and its environment--is inextricably linked to the world. American firms and workers compete in a global economy shaped by global trends. The lives of Americans are increasingly affected by global environmental change. In an era of weapons of mass destruction, savage terrorism, and sophisticated transnational crime, national security is tied to conditions and events around the globe. What Americans do and say affect the rest of the world; and changes in the lives of other peoples--whether positive or negative--affect Americans at home.

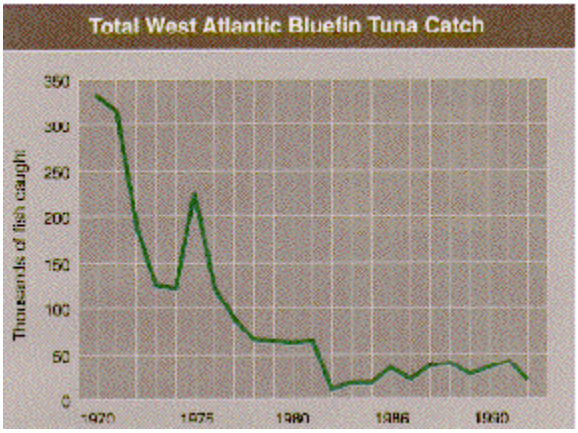
The United States influences other nations by the force of its example, the power of its economy, and the strength of its arms. The model of American democracy and prosperity has shaped the hopes of many millions of people. The demands of U.S. markets and the products of U.S. industries influence the economic course of much of the world. With one of the highest standards of living in the world, the United States is the largest producer and consumer in history: with fewer than 5 percent of the world's population, the nation consumes nearly 25 percent of the planet's resources. This high standard of living and huge economy also have made the United States the world's largest producer of wastes and have given the country cause and capacity to become the world leader in the creation and use of innovative technology to reduce wastes and control pollution.[1] Many nations seek to emulate the successes of the U.S. system of environmental protection.

The United States is a world leader--often the world leader--whether it chooses to exercise leadership or not. Other nations hesitate to act to address international issues of security, development, or the environment unless the United States takes the lead. And issues of development, environment, and human security are as surely related globally as they are locally. This country will not prosper, nor will freedom thrive, in a violent and unstable world. Poverty, inequity, and environmental destruction corrode the bonds that hold stability and progress together. The peoples of the world can only achieve their legitimate aspirations for economic

betterment within the context of environmental protection and a more equitable distribution of the fruits of that progress. Improvement in people's lives will benefit this country economically, environmentally, and socially by mitigating important sources of global conflict.

There is another reason for U.S. leadership internationally: certain problems can only be addressed through global cooperation. It is easy to understand that the control of nuclear weapons or the creation of conditions for freer trade requires agreement among nations. The same is true of global environmental problems. Previous chapters of this report emphasize the importance of local communities and individual responsibility in moving the United States toward a more sustainable path; some issues affecting individuals and communities can only be solved, however, if nations agree upon common goals and shared responsibilities.

Figure 13



SOURCE: International Commission for the Conservation of Atlantic Tuna, Standing Committee on Research and Statistics, Draft Bluefin Tuna Working Group Report (Madrid, 1993), table 2.

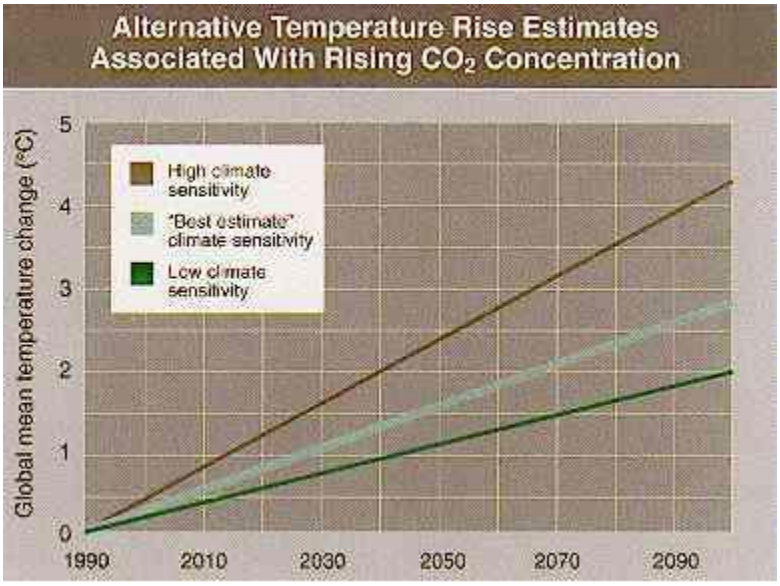
For example, the fishermen of many nations have competed for declining wild stocks of tuna, salmon, cod, and many other fish (see figure 13), a competition that recently flared into violent confrontation and international conflict.[2] The collapse of some fisheries brought misery to communities in the United States and elsewhere. No single nation can by itself limit catches to sustain the fisheries. All nations must agree to abide by the same rules to save the shared resource.

Forests--particularly tropical forests - play a critical role in maintaining the diversity, productivity, and resilience of global ecosystems.[3] Forests are also important national resources subject to sensitive issues of sovereignty. In response both to global markets for tropical hardwoods and domestic demand for land and materials, many countries are rapidly cutting their forests. Individual nations understandably resist calls to preserve their forests to provide global benefits. Only cooperative solutions based on global agreements will work.

Cooperation has worked effectively in structuring a phaseout of chlorofluorocarbons, the human-made gases destroying the ozone layer. U.S. industries responded to clear goals and economic

incentives with a flurry of successful innovations that put them ahead of the agreed-upon schedule. The issues that demand international action include not only damage to ocean ecosystems and deforestation, but also--most importantly--changes in the atmospheric chemistry and composition that influence the global climate and loss of biological diversity. Each of these changes is proceeding at an accelerating rate with consequences that are difficult to predict with certainty or precision. Moreover, none of these phenomena can be quickly reversed after their consequences have been fully understood.

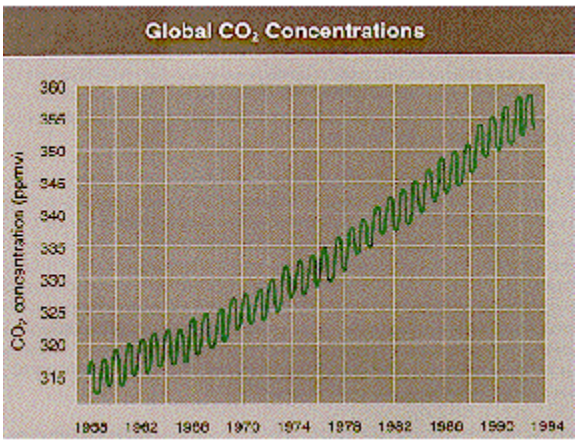
Figure 14



The Council heard a set of presentations concerning the science of climate change, the risks, and the uncertainties. Human activities are increasing the concentrations of so-called greenhouse gases. The models used by the Intergovernmental Panel on Climate Change predict a warming of 0.80 F to 3.5 F by the year 2100, although the resulting effects are much less clear.[4] (See figure 14.)

U.S. emissions of carbon dioxide, the primary greenhouse gas due to human activity, make up approximately 25 percent of global emissions of this gas; the per capita U.S.emissions rate is higher than that of any other major industrialized country and many times that of any developing country. In the future, emissions from the developing world will grow rapidly as their economies grow, and atmospheric concentrations of greenhouse gases consequently will rise. Without change, emissions from developing nations will surpass those from industrial nations--but not for several decades.[5] (See figure 15.)

Figure 15



SOURCE: Intergovernmental Panel on Climate Change, Climate Change 1994 - Radiative Forcing of Climate Change, J.T. Houghton et al., eds. (Cambridge: Cambridge University Pre5s, 1995), p. 43.

It is clear that the United States cannot solve the potential problem of climate change alone. But it also is clear that unless the industrialized nations demonstrate the benefits of a different development path, there will be little incentive for the rest of the world to follow.

Threats to the global stock of biodiversity represent another global environmental challenge. Although the risks and implications for the United States (as well as its own contribution to the problem) may seem vague and uncertain, the economic and environmental effects could be profound. Economic benefits from wild species make up an estimated 4.5 percent of the U.S. gross domestic product. Fisheries contribute about 100 million tons of food worldwide. One-fourth of all prescriptions dispensed in the United States contain active ingredients extracted from plants, and more than 3,000 antibiotics are derived from microorganisms. Further, nature tourism generates an increasing percentage of tourism revenues worldwide. Yet, for all its value, biodiversity often takes a back seat in many economic development plans. Tropical forests house between 50 and 90 percent of all species on Earth, but because of forest clearing, 5 to 10 percent of the tropical forest species may be faced with extinction within the next 30 years.[6] (See figure 16.) Around the globe people who depend on the sea for a living are already witnessing a decline in the productivity of many of the world's most valuable fisheries. As with climate change, one nation cannot solve the problem alone, and the potential for economic harm is huge.

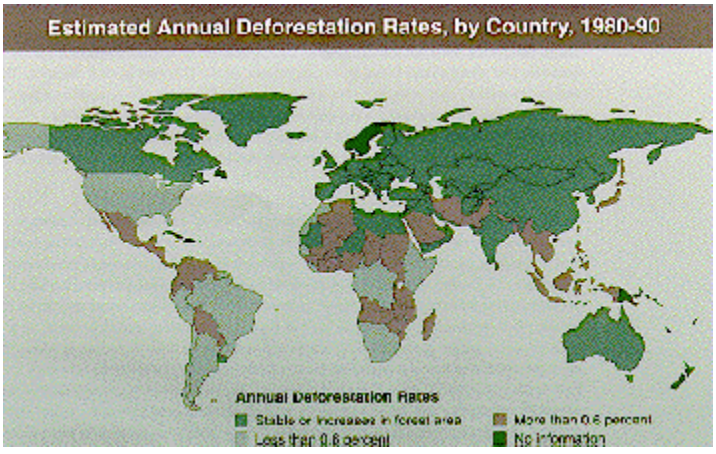
In accepting the challenges of leadership posed by its wealth, strength, know-how, and history, the United States must first adopt effective domestic policies to achieve sustainable development so that it can demonstrate that a better path to progress is possible. Falling short of its own goals may signal to the world the ineffectiveness of free institutions to create environmentally sound economic development that equitably distributes the benefits of growing prosperity. If the United States believes that free institutions are the best means for pursuing human aspirations, it must show that these institutions can respond to the great changes taking place.

More than 100 nations have established national councils on sustainable development similar to the U.S. President's Council on Sustainable Development; they seek to create consensus and shape policies to bring together economic, environmental, and equity goals.[7] Some, like the Canadian and Australian Roundtables, began their work several years before the U.S. Council. Most have been organized in response to the 1992 Earth Summit, the United Nations Conference on Environment and Development. Each of the councils is addressing the relationship of human well-being, economic progress, and the environment within the fabric of the conditions, needs, heritage, and politics of its own country. Their council representatives have said--in many different ways--that if the United States fails, they cannot succeed; but if the United States embraces the idea of sustainability, they believe their own nations will as well.

Because the United States is linked to the world by inter-related economic, environmental, and security interests, it cannot simply turn inward. The nation will achieve much that is in its interest by arguing the case for and assisting the transition to global sustainability. It can create markets for U.S. technology, foster equitable conditions under which U.S. industries and workers can compete, and build fair agreements for action to address global problems that affect the United States and its citizens. International engagement for sustainability is a task for government in its relations with other governments, but it is also a task for other parts of society.

For decades, and with considerable success, America has provided aid to nations to encourage development, fight disease, build democracy, and reduce environmental damage. The majority of that aid has come from government, but U.S. philanthropic organizations also have channeled billions of dollars of voluntary contributions into national and global efforts to meet human needs and protect the future. Leading U.S. companies have been influential in moving their industries toward openness and the application of consistent codes of responsible global stewardship. Nongovernmental organizations have helped to spur the creation of strong independent voices in debates on development, environment, and social policies around the world. Both official and unofficial roles are essential to the process of international change.

FIGURE 16



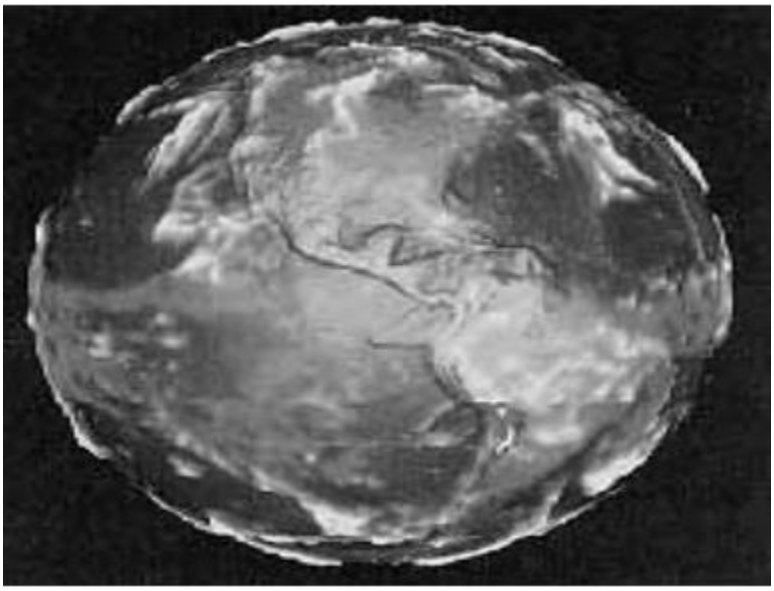
There must be several elements to this national engagement. One element is having strong and effective bilateral and multilateral development assistance agencies. Through organizations such as the U.S. Agency for International Development, the United Nations, the Global Environment Facility, and the various international organizations charged with helping implement the international environmental accords, the United States can demonstrate its commitment to global development paths that make sense for both this country and the rest of the world. The United States can also continue to play a key role in helping developing countries confront the critical problems this nation has already solved at home, such as the removal of lead from gasoline and the development of environmental assessment techniques. Financial support is one way for the United States to make credible, substantive, and analytical contributions to the work of multilateral institutions and encourage broader participation by other countries.

Second, the United States is a signatory to the international conventions or treaties that are designed to promote common actions to reduce the risks of climate change and biodiversity loss--two of a growing list of international accords to address global environmental concerns.[8] Yet, the United States has not ratified the U.N. Convention on Biological Diversity--the only major industrialized country that has not done so--even though ratification was supported by a broad cross section of U.S. industry and environmental groups. As a result, the United States faces the risk of not being able to participate in the treaty or help shape the treaty's evolution. Further, the United States may forgo potential economic benefits from the import of genetic resources. The international environmental treaties may not be perfect from many different perspectives, but they do offer a framework for nations to use to move forward together when there is little incentive to move alone. America will derive the greatest benefit in support of its economic and environmental interests by participating in these treaties as well as in the full range of international development assistance processes.

Third, this nation must not diminish either the importance of scientific research for domestic and international fronts or the importance of the U.S. role in such research. To develop treaties to deal with new concerns and issues effectively, the scientific understanding of the problems and the possible responses to them must continue to be improved. Therefore, the United States should continue to support research and encourage other nations to participate more in international research on critical issues relevant to health and the environment.

Finally, but no less importantly, this nation should continue to promote and encourage global trading systems that mutually reinforce environmental protection and other social development goals. In recent years, initial steps have been taken to incorporate environmental provisions into regional and multilateral agreements designed to reduce trade barriers and improve equitable access to global markets. These agreements may serve to enhance U.S. economic well-being as well as that of other nations and to promote, in a broader sense, greater global stability. Much still needs to be done, however, in reconciling trade and environmental objectives in an increasingly integrated world economy. This is not just a job for governments, but requires the resources and commitment of the industrial community and the private sector as a whole. Improved economic health and political stability can provide greater resources for environmental

protection and a more effective coordinated global approach to the challenges that the nations of the world face together.



GLOBAL CLIMATE CHANGE

The Earth has a blanket of gases that keeps its temperature at an average of about 600 F.[9] Without this natural greenhouse effect, the Earth's average temperature would be about O F, and the Earth itself would be frozen solid. Life as we know it would not be possible.

The greenhouse effect is the result of naturally occurring gases in the atmosphere, principally water vapor, carbon dioxide, methane, and nitrous oxide. These gases trap some of the Earth's outgoing infrared radiation and, like a vast blanket, keep the Earth wormer than it otherwise would be. With the industrialization that has occurred over the past 150 years, the atmospheric concentrations of greenhouse gases have increased, and new greenhouse gases (such as chlorofluorocarbons that deplete the ozone layer) have been added to the atmosphere. The most important greenhouse gas influenced by human activity is carbon dioxide. Concentrations of carbon dioxide have increased by about 30 percent over preindustrial levels. Buildup of this gas results primarily from the burning of fossil fuels and deforestation.

The buildup of greenhouse gases in the atmosphere is expected to lead to an enhanced greenhouse effect popularly referred to as global warming. Carbon dioxide accounts for the great majority of global warming; because of the enormous complexity of the Earth's climate system,

it is not possible to predict with certainty the temperature rise or other effects that will occur as concentrations of greenhouse gases increase. Generally though, models predict that global worming will lead to higher surface temperatures and to a rise in sea levels. They also suggest more severe droughts and/or floods in some places and the possibility of more extreme rainfall events. The Earth has wormed by about 10 F since preindustrial times, and the international scientific community now believes that the balance of evidence suggests a discernable human influence on global climate.

Efforts to reduce the risks of global warming include initiatives to reduce man-made emissions of greenhouse gases domestically and through cooperative efforts with other countries. One such initiative is the recently developed pilot program, the United States Initiative on Joint Implementation.[10] In addition, efforts should be pursued to mitigate potential effects of global warming and to adapt to those effects. Since the world depends on fossil fuels (which account for most carbon dioxide emissions) for 90 percent of its energy, the implications of global warming could be profound. If the risks of warming are judged to be too great, then nothing less than a drastic reduction in the burning of coal, oil, and natural gas would be necessary.

PROTECTING A RITE OF AUTUMN

As days grow colder and shadows longer, ducks and geese fill the skies of North America on their migratory journey south. For some, it's a very long trip. The tiny blue-winged teal, for example, starts from the northern plains of Canada, passes over wheatfields and cornfields of the United States, crosses the Gulf of Mexico, and comes to rest at wintering grounds in Mexico and parts of South America.

This rite of autumn may not be witnessed by future generations if important wetlands habitats along migratory routes continue to be drained and developed. Ten years ago, North American waterfowl populations had plummeted to record lows. More than half -- and by some estimates much more -- of 215 million acres of U.S. wetlands habitat within the lower 48 states had disappeared since the arrival of the first European settlers. Across Canada, estimates of wetlands losses for different areas range from 29 to 71 percent over the same period.

Because efforts to safeguard migratory waterfowl cannot succeed without international cooperation, the governments of the United States, Canada, and Mexico have been working on a

strategy to protect, restore, and enhance waterfowl habitat. In 1986, Canada and the United States established the North American Waterfowl Management Plan, which recognizes that the recovery and sustainability of waterfowl populations depend on maintaining wetlands and associated ecosystems throughout the North American continent. Mexico became a participant in this plan in 1994.

The strength of the North American Waterfowl Management Plan lies in the partnerships it encourages among federal, state, provincial, and local governments; businesses; conservation organizations; and individual citizens. To date, this wide array of public and private partners has undertaken 12 joint ventures involving habitat and two directed toward individual species -- Arctic nesting geese and black ducks. None of these projects has been mandated by or subject to regulation and participation is voluntary. Since 1986, over half a billion dollars has been invested in plan projects. More than 2 million acres of habitat have been protected, and 2.5 million acres restored or enhanced.[11]

"Migratory birds are a natural resource we share," says Francisco Flores Verdugo, a professor at the National University of Mexico and member of Mexico's plan committee. "They have an impact on the economic and cultural aspects of all three countries and have to be managed multinationally for optimal conservation." Says Frank Dunstan, vice president for wildlife sanctuaries at the National Audubon Society, "One of the great successes of the plan is that its conservation impact expands beyond just waterfowl and protects all sorts of wetlands wildlife and species."

POLICY RECOMMENDATION 1

INTERNATIONAL LEADERSHIP

Promote economic and national security by actively participating in and leading cooperative international efforts to encourage democracy, support scientific research, and enhance economic development that preserves the environment and protects human health.

ACTION 1. The federal government, assisted by nongovernmental organizations and private industry, should maintain scientific research and data collection related to global environmental challenges. Credible, complete, and peer-reviewed research and data are central to guiding U.S. policy and international deliberations.

ACTION 2. The federal government should cooperate in key international agreements -- from ratifying the U.N. Convention on Biological Diversity to taking the lead in achieving full implementation of specific commitments made in international environmental agreements to which the United States is a party.

ACTION 3. The federal government should increase support for effective and efficient bilateral and multilateral institutions as a means to achieve national sustainable development goals.

ACTION 4. The federal government should ensure open access for, and participation of, nongovernmental organizations and private industry in international agreements and decision-making processes.

MADE IN THE USA: EXPORTING ENVIRONMENTAL TECHNOLOGIES

Environmental technologies are of growing worldwide interest, creating a vast market that U.S. firms are eager to tap. The U.S. Department of Commerce estimates that the global market is currently $400 billion, a number it projects could grow to $600 billion by the year 2070. In the United States alone, 1994 environmental spending was approximately 2-5 percent of the gross domestic product, or more than $165 billion. According to one private research firm, U.S. exports of environmental products and services are worth about $10 billion each year, supporting 170,000 domestic jobs here.[12] While this is a substantial start, the Commerce Department and other U.S.government agencies see environmental technologies as a prime candidate for greater U.S. export opportunities and are working to help U.S. businesses sell their technologies overseas.

Underpinning the financial and employment opportunities are the important societal gains that can come with more worldwide trade in environmental technologies. The world's poorest countries are in desperate need of more modern technology to help solve such urgent human health problems as unsafe drinking water and inadequate sewage treatment systems. Rapidly developing countries face growing environmental and human health risks stemming from dirty air and uncontrolled wastes. Finally, the most developed countries continue to look for innovative technologies that allow for more cost-effective and efficient pollution protection and resource use.

Already, U.S. business and federal government partnerships have an impressive track record, even in hard-to-penetrate markets such as Asia. Hazardous wastes in Korea will be cleaned up by IT Corporation, a California-based company that recently won a $3.5 million contract with the

Halla Corporation based in Korea. Many of Jakarta's canals and waterways -- or kolis -- are to be skimmed of debris and pollution, thanks to a $ 10 million contract between the Indonesian government and Aquatics Unlimited of California. Thailand is soon to have a new $2.5 million air pollution tracking system built by the Radian Corporation of Texas. And in China, two American wind turbine manufacturers, FloWind and Zond, have sales agreements totaling $312 million.

Worldwide, the Commerce Department, in conjunction with the U.S. Department of Energy, the U.S. Environmental Protection Agency, and other federal agencies, has helped U.S. companies win more than $1.6 billion in environmental contracts over the lost 18 months. Commerce Secretary Ronald H. Brown, a member of the Council, says of these global trends, "New environmentally sound technologies for products, processes, and services create jobs and growth without environmental harm. Expanding world trade brings the benefits of these technologies and knowledge to the rest of the world. Together, they create a reinforcing cycle of sustainable development."

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[1] World Resources Institute, *World Resources 1994-95*, prepared in collaboration with the U.N. Environmental Program and the U.N. Development Program (New York: Oxford University Press, 1994), p. 268, table 16.1 (for population numbers). The United States has the largest domestic product in the world. See U.S. Department of Commerce, *Statistical Abstract of the United States 1994* (Washington, D.C.: Government Printing Office, 1994), p. 862, table 1366.

Close up estimates of the U.S. share of the world resource consumption range from 20 to 30 percent. In 1993, the United States consumed approximately 24 percent or world energy. See U.S. Department of Energy, Energy Information Administration, *International Energy Annual 1993*, DOE/EIA-0219(93) (Washington, D.C.: Government Printing Office, 1995), p. vii. U.S. consumption of raw materials in 1993 equaled nearly 30 percent of the world total. See U.S. Department of the Interior, Bureau of Mines, "Changing Minerals and Material Use Patterns" (presented at the Annual General Meeting of the Academia Europaea, Parma, Italy, 23-25 June 1994), figs. 5-1 and 5-2. Waste consumption data are from *OECD Environmental Performance Reviews - Netherlands* (paris, 1995), p. 78, fig. 4.2.

[2] U.N. Food and Agricultural Organization (FAO), Rome Consensus on World Fisheries (presented at FAO Ministerial Conference on Fisheries, Rome, Italy, 14-15 March 1995).

[3] World Resources Institute, *Global Biodiversity Strategy: Guidelines for Action to Save, Study and Use Earth's Biotic Wealth Sustainably and Equitabliy*, prepared in collaboration with the

U.N. Environmental Program and The World Conservation Union (Washington, D.C.: World Resources Institute, 1992), p. 7, citing C.D. Thomas, "Fewer Species," *Nature* 347 (1990): 237.

[4] Intergovernmental Panel on Climate Change (IPCC), *Climate Change: The IPCC Scientific Assessment*, J.T. Houghton, G.J. Jenkins, and J.J. Ephraums, eds. (Cambridge: Cambridge University Press, 1990), p. xi. In addition to the 1990 report, IPCC issued reports in 1992 and 1994 and is drafting a 1995 update. See IPCC, *Climate Change 1992: The Supplementary Report to the Scientific Assessment*, J.T. Houghton, B.A. Callander, and S.K. Varney, eds. (Cambridge: Cambridge University Press, 1992); and *Climate Change 1994: Radiative Forcing of Climate Change*, J.T. Houghton et al., eds. (Cambridge: Cambridge University Press, 1994).

[5] G. Marland, R.J. Andres, and T.A. Boden, "Global, Regional, and Natural CO_2 Emissions," in T.A. Boden et al., eds., *Trends '93: A Compendium of Data on Global Change* (Oak Ridge Tenn.: Oak Ridge National Laboratory, 1994), pp. 505-84; and *World Resources 1994-95*, p. 202, table 11.7. Future projections are from International Energy Agency, *World Energy Outlook 1995* (Paris: Organization for Economic Cooperation and Development/International Energy Agency, 1995), pp. 48-49.

[6] Data on economic benefits of biodiversity are from *Global Biodiversity Strategy*, p. 2, citing C. Prescott-Allen, (New Haven: Yale University Press, 1986); U.N. Food and Agriculture Organization (FAO), *FAO Yearbook Fisheries Statistics 1993*, vol. 76 (Rome, 1993), p. xi, "World Catch"; Walter V. Reid et al., *Biodiversity Prospecting: Using Genetic Resources for Sustainable Development* (Washington, D.C.: World Resources Institute, 1993), p. 7; *Global Biodiversity Strategy*, p. 4; and The Ecotourism Society, *Ecotourism Statistical Fact Sheet* (N. Bennington, Vt., 1995), citing Fern Filion, "Economics of Global Ectourism," in Mohan Munasinghe and Jeffrey McNeely, eds., *Protected Areas -- Economics and Policy* (Washington, D.C.:World Bank, 1994).

Extinction projections are from *Global Biodiversity Strategy*, p. 7, citing Walter V. Reid, "How Many Species Will There Be?" in T. Whitmore and J. Sayer, *Tropical Deforestation and Species Extinction* (London: Chapman and Hall, 1992), p. 63; and Paul R. Ehrlich and Edward O. Wilson, "Biodiversity Studies: Science and Policy," *Science* 253 (1991): 759-62.

[7] The Earth Council, *Directory of National Councils for Sustainable Development*, 2nd ed., directory compiled with assistance from World Resources Institute, Natural Resource Defense Council, and U.N. Department of Policy Coordination and Sustainable Development (San Jose: The Earth Council, 1995).

[8] The United States signed the Climate Convention on 15 June 1992, ratifying it on 15 October 1992; and signed the Biodiversity Convention on 4 June 1993. See U.N. Office of Legal Affairs, *United Nations -- Multilateral Treaties Deposited With Secretary-General, Status as of 31 December 1994 With Supplements*, ST/LEG/SER.E/13 (New York: United Nations, 1994).

[9] The discussion of climate change is based on the Intergovernmental Panel on Climate Change studies listed in note 4. In addition, there are other major studies on global climate change. See National Research Council (NRC), *Energy and Climate* (Washington, D.C.: National Academy of Sciences, 1997); NRC, *Carbon Dioxide and Climate: A Scientific Assessment* (Washington, D.C.: National Academy of Sciences, 1979); NRC, *Changing Climate: Report of the Carbon Dioxide Assessment Committee* (Washington, D.C.: National Academy Press, 1983); NRC, *Global Change and Our Common Future: Papers From a Forum* (Washington, D.C.: National Academy Press, 1989); NRC, *Ozone Depletion, Greenhouse Gases, and Climate Change* (Proceedings of Joint Symposium by the Board on Atmospheric Sciences and Climate and the Committee on Global Change, Commission on Physical Sciences, Mathematics and Resources) (Washington, D.C.: National Academy Press, 1989); National Academy of Sciences, *Policy Implications of Greenhouse Warming: Mitigation, Adaption, and the Science Base* (Washington, D.C.: National Academy Press, 1992); U.S. Congress, Office of Technology Assessment, *Preparing for an Uncertain Climate -- Volume 1*, OTA-O-567 (Washington, D.C.: Government Printing Office, 1993).

[10] For more information on joint implementation, see President William J. Clinton and Vice President Albert Gore, Jr., *The Climate Change Action Plan* (Washington, D.C.: The White House, 1993), pp. 26-31.

[11] U.S. Fish and Wildlife Service, *North American Waterfowl Management Plan*, fact sheet (Washington, D.C., 1995); Council on Environmental Quality, *Environmental Quality: The Twenty-Fourth Annual Report* (Washington, D.C.: Government Printing Office, 1993), pp. 96 and 99; and U.S. Fish and Wildlife Service, *1994 Update to the North American Waterfowl Management Plan -- Expanding the Commitment* (Washington, D.C., 1994), p. 2.

[12] U.S. Department of Commerce, International Trade Administration, citing estimate by Environmental Business International, Inc., *Environmental Business Journal*^{R}*, August 1995: pp. 1-5. In 1993, the environmental industry generated $133 billion in revenues or about 2 percent of the gross domestic product. The industry employed over 1 million people. See Statistical Abstract of the United States 1994, table 373; and p. 446, table 684.*

Appendices

Appendix B: Examples of Sustainable Development in Action

The Pollution Prevention Pilot Project
"There Aren't Enough Hours in the Day"
Regulatory Flexibility and Accountability in Action
Power, Leg Room, and 80 Miles to the Gallon
From the Top of a Mountain to the Heart of the City
Tools for Extended Product Responsibility
Responsible Care
Preserving the Long Island Pine Barrens
Oregon Benchmark -- Indicators of Progress
Friends of the Future
GLOBE: Hands-on Learning
Color Me Green
Partnership for Protection
Chattanooga: A City Remaking Itself
Nourishing Communities: Jordan Commons
Pattonsburg: A Town Renewal
California Sprawl
Creating Clean Jobs
Revitalizing Brownfield Sites
Mono Lake and "Drought-Proofing" Los Angeles
Protecting Louisiana Wetlands
The Return of the Atlantic Striped Bass
"They Didn't Expect Applause"
Teens Teaching Teens
New Economics for Women
Global Climate Change
Protecting a Rite of Autumn
Made in the USA: Exporting Environmental Technologies

Appendix C: List of Figures