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UNITED STATES OF AMERICA



COUNTRY PROFILE



UNITED NATIONS

INTRODUCTION - 2002 COUNTRY PROFILES SERIES

Agenda 21, adopted at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, underscored the important role that States play in the implementation of the Agenda at the national level. It recommended that States consider preparing national reports and communicating the information therein to the Commission on Sustainable Development (CSD) including, activities they undertake to implement Agenda 21, the obstacles and challenges they confront, and other environment and development issues they find relevant.

As a result, in 1993 governments began preparing national reports for submission to the CSD. After two years of following this practice, the CSD decided that a summarized version of national reports submitted thus far would be useful. Subsequently, the CSD Secretariat published the first Country Profiles series in 1997 on the occasion of the five-year review of the Earth Summit (Rio + 5). The series summarized, on a country-by-country basis, all the national reports submitted between 1994 and 1996. Each Profile covered the status of all Agenda 21 chapters.

The purpose of Country Profiles is to:

- Help countries monitor their own progress;
- Share experiences and information with others; and,
- Serve as institutional memory to track and record national actions undertaken to implement Agenda 21.

A second series of Country Profiles is being published on the occasion of the World Summit on Sustainable Development being held in Johannesburg from August 26 to September 4, 2002. Each profile covers all 40 chapters of Agenda 21, as well as those issues that have been separately addressed by the CSD since 1997, including trade, energy, transport, sustainable tourism and industry.

The 2002 Country Profiles series provides the most comprehensive overview to date of the status of implementation of Agenda 21 at the national level. Each Country Profile is based on information updated from that contained in the national reports submitted annually by governments.

Preparing national reports is often a challenging exercise. It can also be a productive and rewarding one in terms of taking stock of what has been achieved and by increasing communication, coordination and cooperation among a range of national agencies, institutions and groups. Hopefully, the information contained in this series of Country Profiles will serve as a useful tool for learning from the experience and knowledge gained by each country in its pursuit of sustainable development.

NOTE TO READERS

The 2002 Country Profiles Series provides information on the implementation of Agenda 21 on a country-by-country and chapter-by-chapter basis (with the exception of chapters 1 and 23, which are preambles). Since Rio 1992, the Commission on Sustainable Development has specifically addressed other topics not included as separate chapters in Agenda 21. These issues of trade, industry, energy, transport and sustainable tourism are, therefore, treated as distinct sections in the Country Profiles. In instances where several Agenda 21 chapters are closely related, for example, chapters 20 to 22 which cover environmentally sound management of hazardous, solid and radioactive wastes, and chapters 24 to 32 which refer to strengthening of major groups, the information appears under a single heading in the Country Profile Series. Lastly, chapters 16 and 34, which deal with environmentally sound management of biotechnology, and transfer of environmentally sound technology, cooperation, capacity-building respectively, are presented together under one heading in those Country Profiles where information is relatively scarce.

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LIST OF COMMONLY USED ACRONYMS

ACS	Association of Caribbean States
AMCEN	Africa Ministerial Conference on the Environment
AMU	Arab Maghreb Union
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
CARICOM	The Caribbean Community and Common Market
CBD	Convention on Biological Diversity
CIS	Commonwealth of Independent States
CGIAR	Consultative Group on International Agricultural Research
CILSS	Permanent Inter-State Committee for Drought Control in the Sahel
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
CSD	Commission on Sustainable Development of the United Nations
DESA	Department for Economic and Social Affairs
ECA	Economic Commission for Africa
ECCAS	Economic Community for Central African States
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
ECOWAS	Economic Community of West African States
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FIDA	Foundation for International Development Assistance
GATT	General Agreement on Tariffs and Trade
GAW	Global Atmosphere Watch (WMO)
GEF	Global Environment Facility
GEMS	Global Environmental Monitoring System (UNEP)
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GLOBE	Global Legislators Organisation for a Balanced Environment
GOS	Global Observing System (WMO/WWW)
GRID	Global Resource Information Database
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IAEA	International Atomic Energy Agency
ICSC	International Civil Service Commission
ICSU	International Council of Scientific Unions
ICT	Information and Communication Technology
ICTSD	International Centre for Trade and Sustainable Development
IEEA	Integrated Environmental and Economic Accounting
IFAD	International Fund for Agricultural Development

IFCS	Intergovernmental Forum on Chemical Safety
IGADD	Intergovernmental Authority on Drought and Development
ILO	International Labour Organisation
IMF	International Monetary Fund
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
IPCS	International Programme on Chemical Safety
IPM	Integrated Pest Management
IRPTC	International Register of Potentially Toxic Chemicals
ISDR	International Strategy for Disaster Reduction
ISO	International Organization for Standardization
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature and Natural Resources
LA21	Local Agenda 21
LDCs	Least Developed Countries
MARPOL	International Convention for the Prevention of Pollution from Ships
MEAs	Multilateral Environmental Agreements
NEAP	National Environmental Action Plan
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organizations
NSDS	National Sustainable Development Strategies
OAS	Organization of American States
OAU	Organization for African Unity
ODA	Official Development Assistance/Overseas Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
PRSP	Poverty Reduction Strategy Papers
SACEP	South Asian Cooperative Environment Programme
SADC	Southern African Development Community
SARD	Sustainable Agriculture and Rural Development
SIDS	Small Island Developing States
SPREP	South Pacific Regional Environment Programme
UN	United Nations
UNAIDS	United Nations Programme on HIV/AIDS
UNCED	United Nations Conference on Environment and Development
UNCCD	United Nations Convention to Combat Desertification
UNCHS	United Nations Centre for Human Settlements (Habitat)
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDRO	Office of the United Nations Disaster Relief Coordinator
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UNFPA	United Nations Population Fund

UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNIFEM	United Nations Development Fund for Women
UNU	United Nations University
WFC	World Food Council
WHO	World Health Organization
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization
WWF	World Wildlife Fund
WWW	World Weather Watch (WMO)

LIST OF COUNTRY USED ACCRONYMS

ACF	Agency for Children and Families
ACTPN	Advisory Committee for Trade Policy and Negotiations
AGOA	African Growth and Opportunity Act
AIEO	American Indian Environmental Office
AIRFA	American Indian Religious Freedom
APHIS	Animal and Plant Health Inspection Service
APTI	Air Pollution Training Institute
ARC	Appalachian Regional Commission
ARS	Agricultural Research Service
ATPA	Andean Trade Preference Act
BLM	Bureau of Land Management
BMP	Best Management Practices
C&I	Criteria and Indicators (Montreal Process on Sustainable Forest Management)
CAFE	Corporate Average Fuel Economy
CBD	Convention on Biological Diversity
CE	Conservation Education
CENR	Committee on Environment and Natural Resources
CEPPO	Chemical Emergency Preparedness and Prevention Office
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFP	Cooperative Fire Protection
CGOS	Global Climate Observing System
CIFOR	Center for International Forest Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPSA	Consumer Product Safety Act
CRP	Conservation Reserve Program
CRTK	Chemical Right-to-Know
CTI	Climate Technology Initiative
CWA	Clean Water Act
CZARA	Coastal Zone Act Reauthorization Amendments
DfE	Design for Environment
DOE	Department of Energy
DOI	Department of Interior
DOL	Department of Labor
EAP	Economic Action Program
EDA	Economic Development Assistance (Department of Commerce)
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know
EQIP	Environmental Quality Incentives Program
ERS	Economic Research Service (U.S. Department of Agriculture)
ESA	Endangered Species Act
ETI	Environmental Technologies Industries
ETTAC	Environmental Technologies Trade Advisory Committee
ETV	Environmental Technology Verification
Ex-Im Bank	Export-Import Bank of the United States
FAO	Food and Agricultural Organization
FFRRO	Federal Facilities Restoration and Reuse Office
FGDC	Federal Geographic Data Committee
FHM	Forest Health Management
FHM	Forest Health Monitoring

FHP	Forest Health Protection
FHSA	Federal Hazardous Substances Act
FIA	Forest Inventory and Analysis
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FLP	Forest Legacy
FLPMA	Federal Land Policy and Management Act
FMPA	National Forest Management Act
FQPA	Food Quality Protection Act
FSA	Farm Services Agency
FSP	Forest Stewardship Program
FWS	Fish and Wildlife Service
GAP	Gap Analysis Program
GEF	Global Environment Facility
GFFE	Global Food for Education
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GLOBE	Global Learning and Observation
GOOS	Global Ocean Observing System
GPRA	Government Performance and Results Act
GREEN	Global Rivers Environmental Education Network
GSN	Global Seismographic Network
HHS	Health and Human Services
HUD	Department of Housing and Urban Development
IAC	Interagency Council
IAEA	International Atomic Energy Agency
IAI	Inter-American Institute
ICLEI	International Council for Local Environmental Initiatives
ICMA	International City/County Management Association
ICRAF	International Center for Agroforestry Research
ICRI	International Coral Reef Initiative
IDEAS	Integrated Dynamic Energy Analysis Simulation
IEFAs	Integrated Economic and Environmental Accounts
IFS	Integrated Farming Systems
IGAC	International Global Atmospheric Chemistry Project
IGPAC	Intergovernmental Policy Advisory Committee
IKS	Indigenous Knowledge and Science
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IPEC	International Program on the Elimination of Child Labor
IPM	Integrated Pest Management
IPR	Intellectual Property Rights
IRIS	Incorporated Research Institutions for Seismology
IUFRO	International Union of Forest Research Organizations
IULA	International Union of Local Authorities
LA21	Local Agenda 21
LEAP	Logger Education to Advance Professionalism
LME	Large Marine Ecosystem
LUCID	Local Unit Criteria and Indicators Development
MEAs	Multilateral Environmental Agreements
NAAEF	North American Association for Environmental Education
NACo	National Association of Counties
NAFC	North American Forestry Commission

NAFTA	North American Free Trade Agreement
NAL	National Agricultural Library
NAS	National Academies of Science
NASA	National Aeronautic and Space Administration
NASF	National Association of State Foresters
NCSE	National Council for Science and the Environment
NEA	National Endowment for the Arts
NEC	National Economic Council
NEETF	National Environmental Education and Training Foundation
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NGOs	Non-governmental Organizations
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service (Department of Interior)
NRCS	Natural Resources Conservation Service
NRCS	Natural Resources Conservation Service
NRCS	Natural Resources Conservation Service
NRCS	Nuclear Regulatory Commission
NSF	National Science Foundation
NSTC	National Science and Technology Council
NWS	National Wildlife Service
OAIT	Office of American Indian Trust
OEE	Office of Environmental Education
OPIC	Overseas Private Investment Corporation
ORLT	The Ozark Regional Land Trust
OSHA	Occupational Safety and Health Administration
OSTP	Office of Science and Technology Policy
OTP	Office of Technology Policy (Department of Commerce)
PCSD	President's Council on Sustainable Development
PRTR	Pollutant Release and Transfer Register
RC&D	Resource Conservation and Development
RC&DC	Resource Conservation and Development Councils
RCRA	Resource Conservation and Recovery Act
REE	Research, Education, and Economics
SARE	Sustainable Agriculture Research and Education
SBIR	Small Business Innovation Research
SDI	Sustainable Development Indicators
SDWA	Safe Drinking Water Act
SEER	State Education and Environment Roundtable
SFP	Sustainable Forestry Partnership
SIP	Stewardship Incentive Program
SITE	Superfund Innovative Technology Evaluation
SRF	State Resolving Fund
TACA	Trade Advisory Committee on Africa
TDA	Trade and Development Agency
TIO	Technology Innovation Office
TOMS	Total Ozone Mapping Spectrometer
TPCC	Trade Promotion Coordinating Committee
TPRG	Trade Policy Review Group
TPSC	Trade Policy Staff Committee
TRIPS	Trade Related Aspects of Intellectual Property Rights

TSCA	Toxic Substance Control Act
TVA	Tennessee Valley Authority
U&CF	Urban and Community Forestry
U.S. TIES	U.S. Technology for International Environmental Solutions
UNDP	UN Development Program
UNEP	UN Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
US-AEP	United States-Asia Environmental Partnership
USAID	United States Agency for International Development
USCSP	U.S. Country Studies Program
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	United States Geological Survey
USIJI	U.S. Initiative on Joint Implementation
USTR	United States Trade Representative
WEP	Water and Environmental Programs
WIPO	World Intellectual Property Organization
WIPP	Waste Isolation Pilot Plant
WRP	Wetland Reserve Program
WTO	World Trade Organization
YEF	Youth, Education, and Families

CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES

Decision-Making: The Office of the U.S. Trade Representative (USTR) is responsible for developing and coordinating U.S. international trade policy, and leading or directing negotiations with other countries on such matters. USTR and the State Department have leadership of international investment policy and negotiation of bilateral investment treaties. On trade policy, U.S. interagency coordination is accomplished by USTR through the Trade Policy Review Group (TPRG) and the Trade Policy Staff Committee (TPSC). These groups, administered and chaired by USTR and composed of 17 Federal agencies and offices, make up the sub-cabinet mechanism for developing and coordinating U.S. Government positions on international trade and trade-related investment issues. A final tier of the U.S. interagency trade policy mechanism is the National Economic Council (NEC), chaired by the President. The NEC Deputies committee considers decision memoranda on trade issues from the TPRG, as well as particular important or controversial trade-related issues.

This chapter of the U.S. Country Profile focuses primarily on U.S. efforts to accelerate sustainable development through trade-related capacity building and cooperation. Trade-related capacity building refers to those activities that directly increase the ability of developing and transition countries to participate in global trade agreements, to engage more actively in trade itself, to assure the benefits of trade are widespread among economic groups, and to assess the possible environmental and social impacts of increased trade and investment. Other, non-trade-related examples of U.S. cooperative efforts to strengthen sustainable development are contained throughout this report.

Programmes and Projects: The United States has employed regional trade programs and initiatives, such as those conducted under the Africa Growth and Opportunity Act, the Andean Trade Preference Act, and the Caribbean Basin Economic Recovery Act, to help strengthen economic opportunities in developing countries. The U.S. has developed export trade programs to help spur dissemination of U.S. environmental technologies and services abroad and has promoted the development and use of environmental guidelines for export credit agency lending among industrialized countries. The U.S. Export-Import Bank (Ex-Im Bank) has established an “Environmental Exports Program”, which increases the level of support it provides to exporters of environmentally beneficial goods and services, as well as to exporters participating in foreign environmentally beneficial projects. This program affords exporters a special level of support in conjunction with either Ex-Im Bank’s Insurance Program or with Ex-Im Bank’s loan and guarantee programs.

Status: U.S. total trade with developing countries continues to increase. Between 1993/94 and 1999/00, U.S. imports from the developing countries (i.e., developing countries' sales to the United States) rose 73 percent or \$118 billion while U.S. exports to the developing countries (i.e., developing countries' purchases from the United States) gained 34 percent or \$45 billion. In 1998 (latest figure available), U.S. FDI in developing countries was valued at \$980.6 billion, up from \$430.5 billion in 1990. See also **Chapter 33**.

Capacity-Building, Education, Training and Awareness-Raising: In 1994, the United States created the Office of Environmental Technologies Exports in its International Trade Administration—now called the Office of Environmental Technologies Industries (ETI)—as the principal resource and key contact point within the U.S. Department of Commerce for U.S. environmental technology companies. ETI's goal is to facilitate and increase U.S. exports of environmental technologies, goods and services by developing information about environmental markets abroad. ETI produces export market plans which outline market conditions in selected countries for environmental goods and services; conducts seminars and workshops to provide information on U.S. Government programs that support the transfer of environmental technologies, goods and services; collaborates with foreign governments to support the provision of technical assistance and capacity building to developing and transitional countries to assist them in employing new technologies for sustainable development; liaises with the U.S. Trade

and Development Agency and the Overseas Private Investment Corporation (TDA and OPIC, see below), and Ex-Im Bank to support finance for sustainable development projects; and analyzes and develops trade policy issues

dealing with the U.S. environmental technologies industry. ETI also staffs the Environmental Technologies Trade Advisory Committee (ETTAC), a statutory federal advisory committee, which advises the Secretary of Commerce in his role as Chairman of the interagency Trade Promotion Coordinating Committee (TPCC) on how to expand trade in environmental goods and services. The Environmental Trade Working Group, a subgroup of the TPCC brings together all U.S. Government agencies focused on the spectrum of government programs that ultimately support environmental trade and sustainable development solutions. These agencies provide a variety of services including capacity building, technical assistance and training, financing, research, etc., to enable broader application and use of environmental technologies that will enhance sustainable development.

To help developing countries realize gains from trade, the United States supports a variety of World Trade Organization (WTO) programs and supplements those efforts by providing trade-related assistance in several technical areas. For example, the U.S. Agency for International Development (USAID) has funded resident advisor teams to help build trade-related legal and institutional capacity in the Ukraine, Russia, Kyrgyz Republic and Kazakhstan to assist these countries with WTO accession. The U.S. Customs Service and USAID provide assistance to improve border operations in Southeast Europe, and are working with the private sector to develop a “model customs entry point” in Shanghai. In the area of intellectual property rights (IPR), U.S. experts from seven government agencies participate in a number of programs, including those sponsored by USAID, the U.S. Department of Commerce Commercial Law Development Program, the U.S. Patent and Trademark Office, the U.S. Copyright Office, the Department of State, the World Intellectual Property Organization (WIPO) and other organizations to help developing countries amend, implement and enforce their legislation to comply with the WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) and other international intellectual property agreements. The U.S. Government reports annually to the WTO TRIPS Council on the training and technical assistance provided to developing countries to assist them with implementation of the TRIPS Agreement.

The U.S. Department of Agriculture (USDA) provides extensive capacity building to assist in implementation of sanitary and phytosanitary (SPS) measures, including seminars, workshops, consultancies and training visits to U.S. facilities. To facilitate global trade in services, the U.S. Department of Commerce, in partnership with the U.S. insurance industry, promotes the development of open and competitive insurance markets in emerging economies. Several U.S. agencies, in cooperation with non-governmental organizations (NGOs) and the private sector, launched the Internet for Economic Development initiative in 1998 to “help accelerate the spread of the Internet and electronic commerce to developing nations.” The Departments of Interior and Justice implement programs to promote developing country capacity to enforce the CITES Agreement, and to ensure that trade in vulnerable species is sustainable. The Department of Labor also provides trade-related technical assistance to develop and strengthen social safety net programs, including improving workplace safety and health, to promote basic worker rights that are crucial to building a strong and sustainable global economy, and to assist countries in monitoring programs to reduce child labor. The U.S. Environmental Protection Agency (EPA) and USAID have concentrated on environmental institutions and human resource capabilities, including environmental training modules and information exchange efforts. About \$300 million of USAID’s annual budget is devoted to trade-related technical assistance and capacity building, including multiple initiatives to assist developing countries identify and address environmental and social needs in the course of trade and investment liberalization. For example, USAID’s Latin American and Caribbean Trade and Environment Program funded the first comprehensive regional analysis of trade and environment issues, which was presented at the Hemispheric Meeting on Trade and Environment in Costa Rica in 1998. In addition, USAID sponsors regional consultations among governments, businesses, and non-governmental organizations on trade and environment issues in the mining, forestry, and other industrial export sectors. These consultations focus on the benefits of clean production, market opportunities for eco-certified products, international environmental standards (ISO 14000), “greening” of private investment, and regulatory frameworks.

USAID also sponsors international sustainable development seminars that have components addressing trade and environment issues. USAID administers the United States-Asia Environmental Partnership (US-AEP), which is a public-private initiative that promotes environmentally sustainable development, particularly the introduction of clean technologies in emerging industrial sectors. US-AEP currently works with governments and industries in eleven target economies. In 1999 and 2000, the United States spent an estimated \$113.3 million on trade capacity building activities in the Asia - Pacific region. (Source: Survey of U.S. Government Initiatives to Build Trade-Related Capacity.) The TDA helps American companies develop commercial opportunities in emerging markets.

This agency provides resources for feasibility studies, training grants, technical assistance and also pursues its mission through orientation visits and conferences.

Information: The Ex-Im Bank maintains a system of environmental review procedures. To provide guidance to U.S. exporters, environmental guidelines are available for assessing potential environmental impacts in the following areas: air quality, water use and quality, management of hazardous and toxic materials and wastes, natural hazards, socioeconomic and socio-cultural effects, ecological effects (including promotion of practices that result in the mitigation of greenhouse gases) and noise. OPIC is an agency with a mandate to facilitate and encourage U.S. private investment in developing countries and emerging markets. Since 1985, OPIC has been required by statute to assess the environmental impacts of projects under consideration for political risk insurance and financing. The statute also directs OPIC to decline assistance to projects posing a “major or unreasonable hazard to the environment, health or safety” or resulting in the “significant degradation of a national park or similar protected area.” OPIC also prepares a voluntary annual report for public dissemination. The reports are aimed at providing information on OPIC’s implementation of and compliance with internal, national and international environmental policies, laws, treaties and agreements to which its programs are subject. OPIC has also highlighted the fact that it is unique among its foreign counterparts in requiring public disclosure of environmental impact assessment for environmentally sensitive projects. In April 1999, OPIC issued a revised “Environmental Handbook” to provide a consistent framework for support of environmentally sound investment in developing countries and emerging markets. OPIC has also committed to track and report CO₂ emissions from its power sector projects and to support international efforts to manage global greenhouse gas emissions.

The U.S. Geological Survey (USGS) is responsible for collecting, analyzing, and disseminating information on the national and international supply and demand for minerals and mineral materials essential to the U.S. economy and national security. A wide range of international activities are supported with cooperative funds from the World Bank, the Inter-American Development Bank, USAID, the Asian Development Bank, U.S. Department of State and others. Some examples of collaborative international mineral resource activities include Saudi Arabia, Siberia, Mongolia, China, India, Mexico, Canada, and Latin America. Information on more than 100 commodities located in more than 185 countries is available from the USGS. Production data, trade data, and other information for most of the countries of the world are also collected and published. The USGS also periodically assesses world energy sources (fossil fuels) and their geologic framework. The USGS assessed the 76 most productive oil and gas provinces of the world, which contain about 95 percent of the remaining oil and gas resources. This assessment is the first of its kind to include a rigorous geologic foundation for remaining resource volumes, and it is the first to make those data available to the geoscience, business, and research communities. During the last 30 years, the USGS has been engaged in coal exploration and characterization in more than 30 foreign countries, including Pakistan, India, China, Turkey, several Eastern European countries, Russia, and other former Soviet Union countries. This work has been accomplished generally with the sponsorship of international donor agencies, such as USAID or the Asian Development Bank.

Research and Technologies: See **Chapter 9**, “Protection of the Atmosphere”.

Financing: See **Chapter 33**, “Financial Resources and Mechanisms”.

Cooperation: The United States remains a major proponent of liberalized trade as a means to promote sustainable development and has consistently advocated trade liberalization in international and regional fora dealing with trade issues, including the World Trade Organization and the Asia - Pacific Economic Cooperation forum. USTR has also affirmed that U.S. trade policies arranged through bilateral agreements and American market access are part of a broad U.S. policy aimed at supporting sustainable development. The U.S. has entered into a bilateral trade agreement with Jordan, which includes provisions for labor and environmental protection. The United States also signed a regional trade agreement with Canada and Mexico (the North American Free Trade Agreement, NAFTA), which has several environmental components. The U.S. has pursued several regional trade enhancement initiatives aimed at helping spur economic growth for developing countries, including the African Growth and Opportunity Act, the Andean Trade Preference Act, and the Caribbean Basin Economic Recovery Act. The U.S. has also been

contributing in international efforts to promote more environmentally friendly foreign direct investment and operations of Multinational Enterprises.

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**CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE
DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC
POLICIES - TRADE**

See previous **Chapter 2**.

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CHAPTER 3: COMBATING POVERTY

Decision-Making: The Congress and the Executive Branch make up the basic decision making structure at the federal level. Federal Agencies involved in implementing programs legislated by Congress include the Department of Health and Human Services (HHS), the Department of Labor (DOL), the Department of Agriculture (USDA), the Department of Housing and Urban Development (HUD) and others. Major groups play an important role in developing and implementing numerous wide-ranging programs aimed at alleviating poverty in the United States. In addition to federal efforts, there are a wide range of poverty alleviation programs by states, religious and charitable institutions, businesses, and local communities. By and large, these non-federal government efforts play an essential role in helping to assist individuals and groups affected by poverty in the United States.

Programmes and Projects: The President’s Council for Sustainable Development (PCSD, June 1993-May 1999, see Chapter 8), had as its stated objectives economic prosperity and equity. Economic prosperity was defined as sustaining 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. In order to provide a safety net for disadvantaged, elderly and disabled persons in American society, the federal government administers a range of social insurance and social assistance programs, including Medicare, unemployment insurance, worker’s compensation, and temporary disability insurance. The federal government works with state governments to provide health insurance to the nation’s poor through a program known as Medicaid. The federal government targets communities exhibiting pervasive poverty through various programs, such as the Empowerment Zones and Enterprise Communities (EZEC) Program, administered by HUD and USDA in rural areas. The EZEC Program provides technical assistance and seed money grants to communities that have successfully organized local partnerships and developed their own long-term plan for holistic community and economic development.

The federal government also provides an array of “income support programs” such as supplemental security income (SSI), temporary assistance for needy families (TANF), food stamps, low-income home assistance programs, public housing, special nutritional programs and general assistance. Federally administered social programs were derived from a range of legislation passed over the years to help meet the needs of particular groups of citizens facing disparities in health. At the federal level, there are several programs, including those related to job training, that are aimed at helping train income disadvantaged individuals. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 revamped many elements of key programs, including TANF and SSI. Similarly, the Workforce Investment Act of 1998 overhauled federally funded employment and job training services, and created employer-led boards at the state and local levels to oversee the funds.

Under the Alaska National Interest Lands Conservation Act (ANILCA), the federal government began managing subsistence hunting, trapping and fishing on Alaska’s Federal public lands in July 1990 through the Federal Subsistence Management Program. Public lands include land managed by Department of Interior (DOI)’s Fish and Wildlife Service (FWS), National Park Service, Bureau of Land Management, Bureau of Indian Affairs, and USDA Forest Service, as well as non-navigable waters on these lands, and some navigable and marine waters. Residents of rural areas may harvest fish and wildlife under Federal subsistence regulations if a recognized, consistent, and traditional subsistence use of that species exists. One of the most important products of subsistence fishing and hunting is food. Subsistence products that are bartered, shared, or used as part of customary trade or ceremony also include clothing, fuel, transportation, construction, home goods and arts and crafts. The Federal Subsistence Board and the State of Alaska’s Department of Fish and Game, with public involvement, regularly review the subsistence regulations. Alaska’s Department of Fish and Game has a Subsistence office that is charged with conducting research to document subsistence uses, estimate subsistence harvest levels, and evaluate potential impacts to subsistence users from other uses. For more information on subsistence programs, refer to <http://www.r7.fws.gov/asm/home.html> and <http://www.state.ak.us/adfg/subsist/subhome.htm>.

The U.S. Department of Commerce’s Economic Development Administration (EDA) also targets economically distressed communities for assistance. Its programs help create wealth and minimize poverty by promoting a favourable business environment to attract private capital investment and value-added employment through capacity building, planning, infrastructure, research grants and strategic initiatives. EDA targets its assistance to Indian tribes, states, units of local government and community nonprofits organizations in economically distressed

areas, regions and communities in order to alleviate conditions of substantial and persistent low income, unemployment and underemployment. EDA promotes sustainable economic development activities, such as brown fields redevelopment and eco-industrial development that address poverty reduction, economic growth, and environmental protection at the same time.

Brownfields redevelopment involves the reuse of abandoned, idled, or under used industrial and commercial sites where expansion or redevelopment is complicated by real or perceived environmental contamination. Since 1997, EDA has invested more than \$250 million in some 250 brownfields redevelopment projects across the United States. Based on the emerging discipline of industrial ecology, eco-industrial development looks at ways that industrial facilities can be designed, developed, and operated to emphasize environmental, energy and resource efficiencies; pollution prevention; and the symbiotic relationship among various industrial processes. Under this model, industrial facilities are co-located so that waste products may be used as feedstocks by neighbouring industries through pre-established industrial exchanges. The eco-industrial development model has emphasized community involvement, job creation and sustainable industrial expansion in economically distressed communities around the nation and highlighted the benefits of environmentally benign manufacturing techniques to the health and economic well-being of disadvantaged and minority populations that are sometimes located in proximity to the nation's industrial facilities.

Status: U.S. poverty thresholds are set to determine whether a person or family is eligible for assistance under a particular federal program. The poverty threshold is established each year by increasing the previous year's threshold according to the change in the Consumer Price Index. The original poverty threshold was devised in the 1960's and was equal to three times the amount of money needed to buy the least expensive "nutritionally adequate" diet. Measuring economic prosperity is facilitated via a variety of yardsticks including economic performance, employment figures, poverty rates, savings and investment. Food insecurity is both an indicator and a result of poverty. Nearly 90 percent of U.S. households were food secure in 1999. This means they had assured access at all times to enough food for healthy active lives. At the same time, 10 percent of households were food insecure, including 3 percent – 3.1 million households – in which people were hungry at times during the year because there was not enough money for food. The Nation's commitment to reduce hunger in the United States is expressed in the billions of dollars allocated each year to USDA's food assistance programs targeted to families and persons in need. Monitoring the extent of food security, food insecurity, and hunger is an essential part of this effort.

Capacity-Building, Education, Training and Awareness-Raising: The 21st Century Workforce initiative is focused on helping current and future workers at all skill levels and in all walks of life meet the challenges presented by the new economy. In the United States today, companies are creating many high-skilled job opportunities. Efforts under a variety of job development and related programs are aimed at helping employers and workers bridge the gap between the requirements of these jobs and the skills of the workers who would fill them.

Information: USDA has an interest in combating poverty because 25 percent of the nation's poor live in rural areas of the United States. USDA's Economic Research Service (ERS) conducts research on rural development, including persistent poverty counties (non-metro counties with 20 percent or more of their population in poverty in each of the census years 1960, 1970, 1980, and 1990). These counties (24 percent of all non-metro counties) contain 19 percent of the non-metro population and 32 percent (2.7 million) of the non-metro poor. According to ERS, the number of counties with high concentrations of poverty decreased dramatically over the last 30 years. In 1960, a total of 2,083 rural counties had 20 percent or more of their population living below the poverty level. By 1990, the number had shrunk to 765, a decline nearly two-thirds and an indication of the remarkable reduction of poverty across rural America. For 535 of those counties, however, poverty continues to be a long-term problem. These counties are heavily concentrated in the Southeast, Appalachia, and the Southwest, with others scattered on Native-American reservations in the North and West.

ERS develops national measurements of "food security" and "hunger" from a special supplement to the U.S. Census Bureau's Current Population Survey that asks households a series of questions about behaviors and experiences known to characterize households having difficulty meeting their food needs. ERS also examines annual changes in food security and hunger, measures the differences in the prevalence of food insecurity and hunger between states and between metropolitan and no metropolitan areas, and develops methods of assessing

community food insecurity. For additional information on ERS research on rural development, persistent poverty, and food security see <http://www.ers.usda.gov>.

Research and Technologies: No information available.

Financing: In 1995, federal expenditures on key social programs such as Old Age Survivor and Disability Insurance (OASDI, or “Social Security”), Medicare, Medicaid, food stamps, TANF, and SSI amounted to over \$740 billion. In 2001, federal expenditures on job training programs through the Department of Labor alone topped \$6 billion. Since 1993, the 57 communities in the USDA rural EZEC Program have received over \$179 million in seed funding. Notably, these pilot communities have leveraged this funding to attract more than \$3 billion from other Federal, State, local government and private sector sources.

Cooperation: As part of its strategy to foster broad-based economic growth in developing countries, USAID is committed to expanding access and opportunity for the poor and ensuring that disadvantaged people have access to resources and technology. USAID efforts in this regard include expanding access to formal financial services for micro-entrepreneurs; expanding access to technology, information, and outreach services; and expanding economic opportunities for women and disadvantaged groups.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS

Overview: Agenda 21 highlights six types of activities countries should focus on when addressing the sustainability of consumption and production patterns: encouraging greater efficiency in the use of energy and resources, minimizing the generation of wastes, assisting individuals and households to make environmentally sound purchasing decisions, exercising leadership through government purchasing, moving towards environmentally sound pricing and reinforcing values that support sustainable consumption. U.S. efforts to address these six types of activities are highlighted in this Chapter, with special attention to the key sectors of energy and transportation.

From 1993-1999, the President’s Council on Sustainable Development (see Chapter 8, Programs and Policies) included a Population and Consumption Task Force to examine consumption patterns and make policy recommendations to the President. The United States has taken many steps as a Federal government, but also on the state and local levels, to promote more sustainable consumption patterns, including, encouraging recycling programs, fostering pollution prevention programs, promoting environmental education, supporting sustainable agriculture practices, and achieving sustainable forest management practices. The Executive Branch of the Federal government, which is charged with implementing Federal law, generally implements national policies promoting sustainable consumption and production in the United States. Sustainable consumption policies of Federal agencies and departments are enabled by the U.S. Congress (Legislative Branch) through parts of existing environmental laws, for example, the Resource Conservation and Recovery Act, which regulates solid and hazardous waste disposal; the Emergency Preparedness and Community Right to Know Act, which requires facilities to report publicly on hazardous substances they manufacture, process or otherwise use; and the Pollution Prevention Act, which creates a hierarchy of waste disposal options (reduce, reuse, recycle).

In the United States, however, most actions and policies that determine consumption are undertaken by civil society, or by the state or local governments. Markets are most efficient at allocating scarce resources among competing demands and are most flexible and effective at anticipating and adapting to changing needs and preferences. Some governmental policies act to correct markets where they may fail to address common needs, such as education, or specific problems, such as protecting the environment. One important role of the Federal government is to provide information about the performance characteristics of “green” products, and about the economic and environmental benefits of sustainable practices, as well as to oversee that advertising claims made by companies are valid. Information is transmitted to the public directly and indirectly, through sponsorship of non-governmental organizations and through educational programs, such as in partnership with local schools, so that consumers can make environmentally sound purchasing decisions. Executive Order 13101 (1998) requires federal procurement officials to assess and give preference to those products and services that are environmentally preferable. The federal government is the single largest consumer of goods and services in the United States, spending more than \$200 billion annually. Executive Order 13101 seeks to use this tremendous purchasing power to help increase demand for greener goods and services and to minimize environmental burdens. EPA manages the Environmentally Preferable Purchasing program, which assists federal agencies in meeting their mandates through tools, training, and information dissemination. Environmentally preferable products are defined as products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose.

In particular, Executive Order 13101 committed the federal government to recycling and buying recycled content, which helps promote cleaner production of industry through recycling. The Superfund Recycling Equity Act of 1999 (SREA) recognizes that recycling activity is an activity distinct from disposal, and that recyclable materials are not wasted. SREA affords recyclers a new defense to “arranger” and “transporter” liabilities involving recyclable materials. State legislatures continue to introduce record numbers of recycling-related bills, with nearly 400 new bills in 2001. Of these, 54 bills passed. The bulk of Federal funding to encourage sustainable consumption practices has been directed at improving resource efficiency and waste minimization practices of the industrial sector, largely through voluntary programs such as Green Chemistry and Industries for the Future. Many voluntary industry-government partnership programs provide industry with sector-specific tools and technical assistance in pollution prevention and energy efficiency. Companies are often motivated to join these programs through public recognition of their environmental leadership, regulatory flexibility and cost savings from more

efficient use of raw materials and decreased waste disposal costs. In theory, these cost savings will be passed on to the consumer in the form of lower prices for sustainably-produced goods and services, which in turn will give these companies a competitive edge in the marketplace. For example, EPA's Design for the Environment Program (DfE, see also Chapter 19) program helps businesses incorporate environmental considerations into the design and redesign of products, processes, and technical and management systems. Through DfE, industry identifies cost-effective alternatives to existing products and processes that reduce risks to workers and the environment while maintaining or improving performance and product quality.

The U.S. Geological Survey (USGS) has collected data on the Nation's water use since 1950. The data from 1950 to 1995 indicate water use in the United States peaked in 1980. Data also indicate that in 1995, the most water (fresh, saline) was withdrawn for thermoelectric power cooling, whereas the most freshwater was withdrawn for irrigation. However, industrial withdrawals declined from 1980 to 1995 after remaining about the same for the years reported from 1965 to 1980.

Decision-Making: No information available.

Programmes and Projects: No information available.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS - ENERGY

Decision-Making: National efforts to promote energy efficiency can be found in several pieces of legislation that predate the 1992 Earth Summit. For example, efforts to develop national appliance efficiency standards date back to the Energy Policy and Conservation Act of 1975. The National Appliance Energy Conservation Act of 1987 sets minimum energy efficiency standards for 12 types of residential appliances. The Energy Policy Act of 1992 also authorized more recent energy efficiency standards and programs to promote efficient and renewable energy. Examples of such policies include the DOT-administered Corporate Average Fuel Economy (CAFE) standard, which mandates a change towards production of more fuel-efficient passenger cars, and the Clean Air Act, which sets national ambient air quality standards for the six principal pollutants (carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide) and provides for a mechanism to ensure that these standards are met.

The U.S. Department of Energy (DOE) and EPA are the two primary agencies responsible for implementing policies that promote sustainable energy consumption and production patterns. USDA implements policies that promote sustainable production and use of biofuels, biopower and biobased products from agriculture commodities, as well as collaborates with other agencies to promote more energy efficient end-use technologies. The U.S. Department of the Interior plays an important role in addressing the energy efficiency of production and consumption patterns through decisions made about protection of certain lands, and mineral and other exploration, extraction and leasing activities. USAID also plays a significant role in encouraging sustainable production and consumption patterns internationally. Citizens, non-profit organizations, businesses and other stakeholders are also heavily involved in discussions related to federal development and implementation of governmental policies and programs through formal public notification, hearings and other consultation processes.

One of President Bush's first acts, as President was to create a National Energy Policy Development Group charged with developing recommendations to help the private sector and government at all levels promote reliable, affordable and environmentally sound energy for America's future. The 2001 report of this group elaborates on a long-term, comprehensive strategy that provides reliable and affordable energy, while accelerating the protection and improvement of the environment. Implementation of the National Energy Policy requires the U.S. Congress to develop implementing legislation and enactment of appropriate policies by the relevant Federal Agencies. In the absence of implementing legislation from Congress, the President can implement certain policies through Executive Orders, the budget process, etc.

Programmes and Projects: Chapter 4 of Agenda 21 recommends several activities to encourage more sustainable production and consumption patterns. These activities include developing a domestic policy framework that encourages a shift to more sustainable consumption and production patterns, encouraging the dissemination of environmentally sound technologies, minimizing the generation of wastes, providing information to assist individuals make more informed purchase decisions, exercising leadership through government purchasing, moving towards environmentally sound pricing, and reinforcing values that support sustainable consumption. The United States has implemented a number of programs that help promote these objectives. Several programs implemented by DOE, for example, serve to improve energy efficiency and promote the transfer and dissemination of more environmentally sound technologies. These programs span all economic sectors and include Clean Cities in the transportation sector, Building America in the residential sector (see also Chapter 7) and Motor Challenge in the industrial sector. The Clean Cities program recognizes various entities for their successful contribution to the growth of the alternative fuel market. Building America is a public/private partnership that provides energy-saving solutions for housing construction, and the Motor Challenge Program is an industry/government partnership that seeks to increase the market penetration of energy-efficient motors for industrial applications. DOE also implements many programs and initiatives to promote renewable energy and alternative fuels. One example, the Distributed Energy Systems program, a public-private partnership, strives to deliver cleaner, more reliable, and affordable energy to consumers through a dispersed fleet of small-scale electric generators located at or near

customer sites. These distributed systems include biomass-based generators, photovoltaic systems, fuel cells, and wind turbines. A goal of this program is to meet 20% of the nation's generating capacity additions with distributed energy resources by the year 2010. Additional information on this program may be found at <http://www.eren.doe.gov/der>. EPA's numerous programs that encourage more sustainable energy consumption include Energy Star Buildings, which promotes energy efficiency improvements through investments in energy-efficient lighting, building envelope materials, heating and cooling systems, and office equipment, leading to both a cleaner environment and dollar savings for businesses. In addition to the programs implemented by DOE and EPA, the US Department of Agriculture (USDA) has initiated many programs that address sustainable production and consumption patterns of energy. USDA is responsible for implementing policies that promote sustainable production and use of biofuels, biopower, and biobased products from agricultural commodities, such as food and feed grains, oilseeds, and biomass such as crop residues, forestry residues, and energy crops. The goals of these policies are to improve economic conditions of rural America, create jobs, increase farm income, reduce greenhouse gas emissions, and reduce our Nation's dependency to foreign oil.

Many agencies within USDA, such as the Forest Service, Rural Development, Natural Resources Conservation Service (NRCS), Office of the Chief Economist, and Cooperatives State Research Education and Extension Service, are directly or indirectly engaged in production and promotion of biofuels and biobased products. Forest Service Research and Development conducts research and develops technologies that conserve energy and promote environmental quality in the production, manufacturing, and use of forest products. A successful program is the Partnership for Advancing Technology in Housing (PATH), which promotes energy efficiency with new building products. In addition, USDA worked closely with DOE and EPA to develop and expand the use of renewable fuels and products.

Scientists in USDA's Agricultural Research Service and DOE are working together to develop technologies to convert abundant and low-value biomass materials, such as corn stover, rice straw, sugarcane, bagasse, energy crops, and municipal solid waste, to ethanol. In addition, USDA and EPA are working together to encourage livestock and poultry farms to participate in the AgSTAR program. The NRCS AgSTAR program is a voluntary Federal program that encourages the use of effective technologies to capture methane gas, generated from decomposition of animal waste into an energy source, which can help livestock producers increase their profit while meeting or exceeding environmental regulatory guidelines. AgSTAR promotes enhanced anaerobic digestion systems to provide methane suitable for on farm energy production. These technologies possibly could help offset energy bills, while reducing on farm pollutants and manure odors. During the past 4 years, the AgSTAR program funded more than 26 projects, workshops, and research grants in California, Iowa, Minnesota, North Carolina, and Oregon. In order to expand the production of energy crops for biofuels and biobased products, USDA has approved four biomass pilot projects for the use of harvested vegetation from the Conservation Reserve Program area to produce energy in Iowa, Minnesota, New York, and Pennsylvania. Biomass plant materials can be burned, converted into combustible gas, or used to produce liquid fuels for this project. Pilot projects will be for a minimum period of 10 years, and the total acreage per project may not exceed 50,000 acres. USDA has initiated a Commodity Credit Corporation (CCC) Bioenergy Program for 2001 and 2002. Under this Program, CCC has entered into an agreement with both ethanol and soy-diesel firms to share the cost of feedstock purchased for use in ethanol and soy-diesel production. The goal of this Program is to increase the use of corn and soybean oil for the production of ethanol and biodiesel. In order to promote the use of alternative fuels (bio-diesel), USDA initiated a new policy for use of ethanol and biodiesel in their fleet vehicles where practicable in cost.

An important role of the federal government is to help assure that consumers have sufficient and reliable information for making choices in the market place. For example, several labeling programs provide data to consumers, as they make purchase decisions, about energy consumption, recycled materials content, toxicity, and composition (including nutritional values) of just about every type of consumer product. The Energy Star Program, sponsored by EPA and DOE, is an extremely successful partnership program devoted to working with manufacturers and providing businesses, schools, local governments and consumers with information on energy-efficient products and purchase options (see more in Chapter 9). EPA also sponsors the Environmental Technology

Verification (ETV) Program that focuses on the performance verification of various environmental technologies. These technologies address clean water and air, global climate change, pollution prevention and clean technologies, and monitoring in all media. Additional information on the ETV Program can be found at <http://www.epa.gov/etv/>. The U.S. Government itself also is adopting more sustainable consumption patterns through the procurement of “greener” technologies. For example, in 1993 a “Greening of the White House Initiative” included installing more energy efficient lighting and weather-tight windows and heating and air conditioning upgrades. An Executive Order in April 2000 directs Federal Agencies with 20 or more vehicles in their fleet to reduce their annual petroleum consumption by 20% below 1999 levels by 2005. More information regarding specific projects and programs related to sustainable consumption patterns in DOE, EPA and USDA can be found at <http://www.energy.gov>, <http://www.epa.gov> and <http://www.usda.gov> respectively.

Status: Looking at U.S. energy statistics in the 10 years since Agenda 21 was conceived illustrates the positive impact that the combined effect of Federal, State, local and corporate programs and practices has had on U.S. consumption patterns. The energy consumed per unit of output in the United States has decreased 16% between 1990 and 1999, from 14.6 thousand Btu per \$1990 to 12.6 thousand Btu per \$1990. The carbon intensity (carbon emitted per unit of \$1000 of output) of the economy fell from 0.24 in 1990 to 0.20 in 1999. Applying innovative energy saving initiatives could reduce statistics such as these further. For example, USDA Forest Service researchers at the Center for Urban Forest Research in Davis, California estimate that if California citizens planted 50 million more shade trees in strategic energy-saving locations, the energy saved would be the equivalent to seven 100 MW power plants. Existing shade trees in California already reduce annual air conditioning energy use by 6,400 GWh, equivalent to 7.3 100 MW power plants, saving customers about \$1 billion in retail expenses for air conditioning and reducing peak load demand by about 10 percent. Many other communities, including cities in Texas, Maryland, Florida, Georgia, Oklahoma, Illinois, Utah and Arizona are studying the effects of tree planting and other means of reducing the urban heat island effect through the Cool Communities Program (<http://www.coolcommunities.org/>).

U.S. companies and financial markets also recognize the importance of achieving more sustainable consumption and production patterns. Dupont, for example, announced a goal to hold energy use flat at 1990 levels and to generate 10% of their energy from renewables. IBM announced a corporate-wide annual goal for improving energy efficiency by 4% through 2004, having already achieved an estimated 20% reduction from 1990 through 1997. Financial markets also recognize companies that incorporate sustainability concepts. The Dow Jones Sustainability Group Index was established to highlight companies in the top 10% of their industry in terms of exhibiting superior environmental, social and economic performance.

Capacity-Building, Education, Training and Awareness-Raising: DOE and EPA work with communities and citizens to provide the necessary information to not only inform the public of their programs, but also to help all citizens make informed decisions regarding sustainable consumption. Domestically, EPA has several programs to promote greater understanding of sustainable energy consumption in the community. As part of its effort to raise awareness on energy-efficiency issues, EPA conducts education courses and training seminars at schools and with businesses. For example, through its Landfill Methane Outreach Program, EPA helps facilitate and promote the use of landfill gas as a renewable energy source. EPA’s Office of Research and Development develops guidelines and technical resource documents that are available through the internet. The most recent example of this is the Guide to Industrial Assessments for Pollution Prevention and Energy Efficiency which can be found at: <http://www.epa.gov/ordntrnt/ORD/NRMRL/Pubs/2001/energy/625R99003.htm>. Additional documents are also being developed related to ISO 14000 Environmental Systems Management. More information regarding EPA’s capacity building, education, training and awareness-raising activities can be found at <http://www.epa.gov/epahome/educational.htm>, and <http://www.epa.gov/epahome/resource.htm>. Internationally, EPA’s Office of International Activities engages in a range of capacity-building efforts in over 15 countries through training, workshops, and joint projects. Similarly, DOE promotes capacity building, education, training and awareness-raising. More information about DOE’s programs, which include Adopt-a-School, Brightfields,

EnergySmart Schools, and Tribal Nations Involvement, can be found at <http://www.energy.gov/community/sub/involved.html>. DOE also has created a website where consumers may turn for money-saving tips and to learn relevant information for improving energy efficiency at home, work, and school. The site also provides federal and state-specific information regarding financing, loans, and grants for making energy efficiency improvements or for helping consumers pay their energy bills. More information can be found at <http://www.eren.doe.gov/consumerinfo/government.html>.

Information: U.S. Government provision of information related to changing consumption patterns could be classified in two categories: (1) general publications provided for interested stakeholders and information provided under the “Right to Know” statute and (2) product labeling. One source of information is through publications. The U.S. government collects and disseminates extensive data on consumption and production of goods and services. The U.S. Energy Information Administration, the statistical agency of the DOE, provides policy-independent data, forecasts, and analyses to promote sound policy making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment. Relevant publications that provide information on consumption and production patterns in the United States, both historical and forecasted, include the U.S. Annual Energy Review (<http://www.eia.doe.gov/emeu/aer/contents.html>) and the U.S. Annual Energy Outlook (<http://www.eia.doe.gov/oiaf/aeo/index.html#preface>). Data also can be found in the annual Statistical Abstract of the United States (<http://www.census.gov/prod/www/statistical-abstract-us.html>).

The Toxics Release Inventory (TRI) is another valuable source of information for consumers, containing information on toxic chemicals that are being used, manufactured, treated, transported, or released into the environment (see also Chapter 19). Established as part of the Emergency Planning and Community Right-to-Know Act and the Pollution Prevention Act, citizens, businesses, and local governments use this information to work together to monitor the quality of their land, air and water. Many of the U.S. labeling programs, such as Energy Star, which are designed to provide consumers with important and relevant information so that they may make informed purchase decisions were already discussed above. The U. S. Geological Survey (USGS) has published several reports on materials flow and sustainability. These include: Aggregate from Natural and Recycled Sources; Economic Assessments for Construction Applications; Consumption of Materials in the United States, 1990 to 1995; Energy Consumption for Recycled and Natural Aggregates; and Trends in Minerals Exploration. The USGS also periodically estimates the amount of oil and gas remaining to be found in the world. The USGS World Petroleum Assessment 2000 is the first of its kind to rigorously document the geologic foundation for estimating undiscovered petroleum resources for the world. The assessed provinces account for 95 percent of the world’s historic production and include both significant established and prospective provinces. The Assessment reports an increase in global petroleum resources, including a 20-percent increase in undiscovered oil and 14 percent decrease in undiscovered natural gas compared to prior assessment. These results have important implications for energy prices, policy, security, and the global resource balance.

Research and Technologies: Research activities are underway and technologies are being applied in a number of areas across a number of Federal Agencies that promote more sustainable consumption. For example, the USDA Forest Service conducts research to develop cost-effective and resource-efficient means of producing, harvesting and processing forest products. DOE is one of the largest sponsors of basic and applied research and development for the nation, supporting research, development, demonstration and diffusion of technologies across all fuel sources and all sectors of the economy. Much of this research and development occurs through, or in cooperation with, one or more of the National Laboratories. There are 13 National Laboratories in the United States, where over 30,000 scientists and engineers work to develop cutting-edge technologies that will help realize DOE’s core missions of science, energy, environmental quality and national security, as well as contribute to sustainable development. It would be impossible to provide information here covering all of the various research activities underway and the technologies being applied by DOE. However, a database highlighting approximately 22,000 RDD&D activities underway in the Department can be accessed at <http://www.osti.gov/rnd/content.html>.

The Office of Research and Development (ORD) is the principle scientific and research arm of EPA. Research activities are focused on three areas. The first area is development and advancement of quantitative tools (e.g., industrial ecology, life cycle assessment (LCA), and greener design methodologies). These tools are being developed to address issues going beyond ORD's traditional focus on pollution prevention for the industrial sector. Other sectors being targeted relate to energy and agriculture. The second area is the development and testing of new processes and technologies both in-house and through the Science to Achieve Results (STAR) Grants Program (Technology for a Sustainable Environment) <http://es.epa.gov/ncercqa/>. ORD is focusing on those new processes and technologies that have the greatest potential of minimizing risks to human health and the environment in a manner which reduces costs, enhances productivity, preserves resources, and considers implications on a multi-media basis. The third area is the advancement of Environmental Systems Management (ESM). ESM is the management of environmental problems at the systems level fully accounting for the multi-dimensional nature of the environment. This includes socio-economic dimensions as well as the usual physical and life science aspects of environmental problems.

Financing: Government, including DOE and EPA, plays a key role in providing financial resources and assistance to encourage more sustainable production and consumption patterns. Two ways in which resources are provided are through research and development (R&D) and through the creation of market incentives, such as tax credits for purchases of energy efficiency or renewable energy technologies. In most cases the U.S. government does not fund R&D 100%, rather it relies on cost-sharing with State and local governments and the private sector. The U.S. Government undertakes much of the basic research necessary that may ultimately lead to technological solutions to key energy and environmental challenges. The total non-defense related research and development budget for the United States increased from \$22.7 billion in 1990 to an estimated \$36.8 billion in 2001. In DOE in 2000, nearly \$1 billion was allocated to basic science research, \$759 million to the Office of Energy Efficiency and Renewable Energy, \$404 million to fossil energy research and development, and \$310 million to solar and renewable resource technologies. The private sector also plays a critical role in the financing of activities that encourage more sustainable consumption patterns. Market incentives also are a means of providing assistance to encourage more sustainable consumption and production patterns. There are numerous Federal, State and local financial incentives that have been established. On the Federal level, for example, the National Energy Policy Act of 1992 created two commercial financial incentives: a 10% Business Investment Tax Credit for purchases of solar and geothermal energy systems and a Production Tax Credit for electricity produced from wind and specified biomass power systems. In more recent events, President Bush's National Energy Policy (NEP) directs the Secretary of the Treasury to work with Congress on legislation to expand tax credits for electricity produced using wind and biomass and to provide a new 15% tax credit for residential solar energy property (up to \$2,000). The NEP also recommends legislation for a temporary income tax credit for the purchase of new hybrid or fuel cell vehicles between 2002 and 2007.

Cooperation: The United States has been active internationally to encourage greater energy efficiency of production and consumption patterns. Many agencies from the U.S. government, including DOE, EPA, USAID, the Department of Commerce, USDA, and the Department of the Interior engage with colleagues in the international community to examine ways to use energy most efficiently. For example, the Technology Cooperation Agreement Pilot Project has been a joint effort between EPA, DOE and USAID to promote the transfer of climate technologies to developing countries. Although this pilot project was initiated in response to international climate change discussions, a primary goal of the project was to identify the sustainable development goals of the host country and then promote the transfer of appropriate technologies to meet these development goals. Information on similar international technology cooperation projects can be found at http://www.usaid.gov/environment/climate_technology_cooperation_activities.pdf. DOE also is active internationally, participating in programs that improve energy efficiency in all sectors of the economy. In the industrial sector, the International Motor Challenge Program is helping manufactures improve the efficiency of

their motor systems. The Program has already been initiated in China, India, and South Africa, and can serve as a model for Latin America. In Mexico, DOE is helping promote renewable energy through the Mexico Renewable Energy Program. This initiative unites the goals of promoting use of renewable energy systems and of enhancing economic and social development, creating new business opportunities, and offsetting greenhouse gas emissions. As a result of this program, over 400 photovoltaic, wind, and hybrid systems have been installed in rural areas of 14 states in Mexico, and commercial markets are taking hold and growing.

Other programs sponsored by DOE include the International Clean Energy Initiative, the Western Hemisphere Oil and Gas Environmental Forum, and the US-Africa Sustainable Energy Program. More details on these and other programs can be found at <http://www.energy.gov>. EPA's Office of International Activities works closely with other nations to address environmental issues that are of mutual concern. For example, a key effort by the Agency is to expand some successful domestic programs to the international arena. EPA works cooperatively with Taiwan, Japan, Canada, New Zealand, Australia and the European Union on energy-efficiency and the use of Energy Star labeling. EPA also has initiated a Green Fleets program in Bangkok, Thailand, working to reduce emissions and enhance fuel efficiency in municipal and private fleets. EPA is also exploring other countries' interests in implementing an Environmental Technology Verification (ETV) Program of their own. In an attempt to expand worldwide access to information, EPA has developed web-sites addressing the Western Hemisphere and the Asia-Pacific region that will organize pollution prevention data and information throughout these regions and share this information globally. USAID is active in spearheading programs that provide increased access to sustainable energy and improve environmental management practices in over forty-five developing countries. USAID energy programs target the multiple goals of rural development, improving environmental conditions, and good governance and management of the energy sector. Program activities cover the areas of sector reform, renewable energy production and use, energy efficiency improvements, cleaner energy technology transfer, emergency planning and disaster preparedness, and cross border and regional energy trade. Notable programs include the West Africa Gas Pipeline, Southern Africa Power Pool, South Asian Regional Initiative/Energy, Central Asian Republics-Oil, Gas, and Power Sector Reform, the Mexico Renewable Energy Program, the Western Hemisphere Standards and Labels Initiative, Technology Cooperation and Partnership Program, and the Clean Energy Technology Initiative. More details on these and other USAID programs can be found at <http://www.usaid.gov>.

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CHAPTER 4: CHANGING CONSUMPTION PATTERNS – TRANSPORT

Decision-Making: The United States Department of Transportation (DOT) has regulatory oversight over all modal transport service providers and also provides financial support for State and local governments. State and local governments have overall responsibility for transportation infrastructure and services. In order to be eligible for Federal assistance, states and urban areas must develop plans for surface transportation improvements for a 20-year horizon as well as for the short term (2 to 3 years). Public involvement is a key component in surface transportation planning and airport improvement decisions. DOT must conduct an environmental review for projects receiving Federal funds or approvals. An environmental impact statement is prepared if the action may result in significant impacts on the environment, and the public may review and comment on the document. In addition to making decisions about how Federal transportation assistance will be used, state and local governments make decisions on urban growth and land-use. Increasing effort is being made at all levels of government toward linking transportation planning with planning for economic development, land-use, growth and improved air and water quality. Federal law requires coordination between transportation planning and planning for actions to reach ambient air quality standards.

Programmes and Projects: The U.S transportation system provides a high level of personal mobility and freight activity for the nation's more than 281 million residents and nearly 7 million business establishments. The national transportation system includes over 4 million miles (6,451,000 km) of streets and highways, 170,000 miles (274,000 km) of railroads and over 3700 marine terminals. The transportation system also includes over 500,000 miles (806,000 km) of oil and gas transmission pipelines, and 18,000 public and private airports. Communities may use a range of Federal transportation programs to support the transportation system while protecting and enhancing the environment. Federal assistance programs are available for improving public transit and highways, linking ports, airports, railroads, and highways, and for making bicycling and walking safer. Special programs help communities meet national air quality standards, improve cultural and environmental qualities, plan for environmentally friendly development, purchase low-emission mass transit vehicles, and improve access to jobs. (See <http://www.fhwa.dot.gov/environment> and <http://www.fta.gov/livable>.) Fuel economy standards for light-duty vehicles, set by the Corporate Average Fuel Economy Program, have improved the fuel efficiency of vehicles. EPA has set emission standards for locomotives and other mobile sources, and both set standards and negotiated voluntary agreements with manufacturers for light and heavy-duty highway vehicles, which have substantially reduced vehicle emissions. More stringent vehicle standards for future model years will further reduce emissions. EPA's fuel quality standards and requirements for cleaner fuels are also an important strategy for reducing pollutant emissions. In 1996, lead was eliminated completely from gasoline. Rules requiring future major reductions of sulfur content in gasoline and diesel fuel have been adopted and will be in effect by mid decade. (See <http://www.epa.gov/air/transport>.)

U.S. laws control discharges of sewage, garbage, and bilge and ballast water within U.S. waters, consistent with provisions of the Maritime Pollution Convention of 1978, to which the United States is signatory. Materials dredged from ports and navigation channels must be properly disposed of, and hazardous or toxic dredged materials may be subject to requirements for disposal in confined facilities. National programs promote safer transportation of hazardous materials. U.S. standards for packaging, labeling and documenting hazardous materials follow U.N. performance standards, and state agencies enforce these standards. Federal regulations and voluntary programs for pipeline operators increase the safety and minimize environmental risks of shipping natural gas and hazardous liquids by pipeline, including inspections and planning emergency response. Federal standards for vessel design and standards for vessel manning and operations, as well as planning for response to oil spills, reduce the risks of pollution in the marine environment. (See <http://www.uscg.mil/hq/g-m/>.) The United States has set aircraft certification standards that follow International Civil Aviation Organization (ICAO) standards for noise. DOT funds are available for joint planning by communities, airports, air carriers and air traffic controllers to reduce

aircraft noise impacts and encourage compatible land development in the areas most affected by noise. Through regulations and funding programs, progress has been made in making transit vehicles and aircraft accessible for persons with disabilities.

Status: Travel and freight movement continue to grow. Transportation energy use has increased from some 22 quadrillion Btu in 1990 to 25 quadrillion Btu in 1998. However, energy used per passenger mile has remained fairly level since 1990, and energy used per ton-mile of freight has declined significantly over 30 years to 370 Btu per ton-mile in 2000. The United States has made progress with fuel and engine improvements, which have reduced air pollutant emissions from ground transportation sources even while travel has increased. Fuel efficiency of new vehicles has improved. Some of the emission reductions and fuel efficiency achieved with technology in passenger cars have been compromised by the increasing consumer use of heavier sport utility vehicles and small trucks, which now account for about one-third of private vehicle travel in the United States. Emissions standards for sport utility vehicles and light trucks are not as stringent as for other passenger vehicles. Fuel economy standards for light trucks are less stringent than for passenger cars, and have not changed since 1996 because Congress has prohibited government work on stricter fuel economy standards. However, recent studies have shown that more stringent limits are feasible, and the restriction may be lifted. Nearly one-third of U.S. greenhouse gas emissions are from transportation sources. The U.S. DOT has established a Center for Climate Change to work on measures to reduce transportation-related greenhouse gas emissions and mitigate effects of climate change on the transportation network (See <http://www.dot.gov/climate>). The U.S. is pursuing a number of initiatives that promote telecommuting, ridesharing, commuting by mass transit and non-motorized travel. Over the past ten years, there has been a steady increase in rail intercity passenger travel and freight movement.

Progress has been made in reducing environmental impacts of transportation infrastructure construction. Wetlands impacts are avoided whenever possible, and where avoidance was not possible, wetlands were replaced at an average ratio of 2.3 acres for every acre of wetlands affected by highway construction in 1999. Transportation agencies and private sector transportation providers are increasingly committed to carrying out good environmental management practices. One example is the recent creation of a program by the American Association of State Highway and Transportation Officials (a nongovernmental organization) that will promote environmental stewardship practices and innovation in environmental protection in transportation. The United States is also working toward a quieter aircraft fleet, and the number of people exposed to high levels of aircraft noise has decreased. New concerns are emerging about the movement of invasive species through transportation.

Capacity-Building, Education, Training and Awareness-Raising: DOT promotes continued education of transportation professionals and supports better understanding of sustainable transportation issues. The U.S. government has joined state, local, and nongovernmental partners in producing and distributing material that promotes transportation alternatives and proper vehicle maintenance, to help reduce impacts of transportation on the environment. (See <http://www.epa.gov/otaq/traq/traqpedo.htm>, especially It All Adds Up to Cleaner Air.) National programs train local responders to emergency releases oil and hazardous materials spills, including drills simulating response to major oil spills.

Information: The U.S. government collects and disseminates extensive data on population and on consumption and production of goods and services. This data is available in the annual “Statistical Abstract of the United States” prepared by the U.S. Census Bureau, and in other data publications. DOE’s Energy Information Administration publishes data on fuel use (See <http://www.eia.doe.gov>.) DOT’s Bureau of Transportation Statistics publishes data on the transportation network, passenger travel, freight and other transport data. (See <http://www.bts.gov>) Remote data sensing and geographical information systems and tools are being used to improve data gathering to help understand impacts of infrastructure projects.

Research and Technologies: The Federal government, through several agencies, has sponsored research on technology for cleaner vehicles and cleaner fuels. Federal government partnerships with manufacturers have led to development of vehicles that are cleaner and more fuel-efficient. For example, several agencies, including DOT, EPA and DOE, have been involved with the Partnership for a New Generation of Vehicles, which has worked to develop new, more fuel-efficient and less polluting vehicles. Another research partnership has resulted in a program called the 21st Century Truck, which is developing cleaner and less polluting buses and heavy trucks. Recently, DOE announced a new program called Freedom Cooperative Automotive Research (Freedom Car). Freedom Car will aim to develop a national infrastructure that will help enable adoption of hydrogen-powered fuel-cell vehicles. In addition, DOT and EPA are working on improving computer models that predict transportation demand and air quality impacts of infrastructure projects. Such models are helpful to state, city and metropolitan planners.

Financing: Federal transportation programs are financed principally through user fees such as gas and airport ticket taxes. A combination of bonds, tolls, user charges and general tax revenues provide funding for transportation capital and programs at the state and local level including port and airport authorities. Federal funding for mass transit services and other surface transportation infrastructure has increased substantially in recent years. Freight rail infrastructure is privately owned, and most rail, air and marine transportation service is provided by the private sector. Recent authorized programs allow innovative financing such as revolving funds, loan guarantees, lines of credit, and credit risk premiums. These innovative finance tools are currently being explored for rail infrastructure projects.

Cooperation: The United States provides assistance and capacity-building to developing countries, helping them better assess the transportation impacts on their environments. The United States has been involved in the work of the Organization for Economic Cooperation and Development (OECD), United Nations bodies and other international organizations on sustainable production and consumption patterns. The United States also cooperates through the European Conference of Ministers of Transport to share information on sustainable transport. The U.S. government is working with ICAO to further reduce noise and emissions from aircraft. Similar cooperation is under way in the International Maritime Organization to reduce impacts of marine engines, reduce pollution risks in the marine environment, and reduce spread of invasive species. DOT is working to exchange technical and institutional knowledge with interested public and private sector stakeholders throughout the world. The United States, the European Commission, and Japan recently negotiated and promoted a Global Agreement for the development of globally harmonized regulations for vehicle safety, environmental protection, energy efficiency and theft protection. The World Forum for the Harmonization of Vehicle Regulations will administer the Global Agreement, which came into effect in August 2000.

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CHAPTER 5: DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY

Decision-Making: The U.S. Bureau of the Census, the Department of Health and Human Services (National Center for Health Statistics, the Centers for Disease Control and Prevention [CDC], and the National Institutes of Health's Center for Population Research), the U.S. Department of Labor, the Immigration and Naturalization Service, and the U.S. Agency for International Development (USAID, the latter internationally only), are most directly concerned with demographic issues. USAID, the Department of Health and Human Services (HHS), and the Department of Education manage and operate programs related to comprehensive population stabilization efforts. An interagency working group composed of representatives of the Department of State, National Security Council, USAID, CDC, US Environmental Protection Agency (EPA), HHS, Department of Labor, Treasury Department, Office of Science and Technology Policy, Council on Environmental Quality (CEQ), Department of Commerce, U.S. Bureau of Census, and the Office of the Vice President coordinate population, environment, and development policies. Many family planning programs are conducted by NGOs such as Planned Parenthood, as well as by state and local health departments. In preparation for the International Conference on Population and Development, public meetings were held throughout the United States to facilitate the participation of NGOs and individuals.

Programmes and Projects: Under the Public Health Service Act, the HHS Office of Population Affairs (OPA) administers two grant programs under Title X, known as the National Family Planning Program, and Title XX, known as the Adolescent Family Life Program. The Title X program supports grants to provide comprehensive family planning and reproductive health services, contraceptive services and supplies, basic gynecological care, clinical breast exams and cervical cancer screenings, related prevention health services, infertility services, education counseling and referral to all eligible persons. Priority is given to persons from low-income families. The Title XX program supports grants for demonstration projects that develop innovative programs to provide health, education and social services to pregnant and parenting adolescents, and develop and test programs for preadolescents, adolescents and their families to delay the onset of adolescent sexual activity and thus reduce the incidence of pregnancy and sexually transmitted disease (STD) infection. The U.S. Geological Survey (USGS) provides water-availability and water-quality information needed in considering demographic dynamics and sustainability. Included in this information is data related to ground-water recharge; ground water is somewhat unique in sustainability studies since ground water is neither a nonrenewable resource, such as a mineral or petroleum deposit, nor is it completely renewable in the same manner and timeframe as solar energy. USGS also provides information related to land subsidence, a global problem that, in the United States, is largely a consequence of exploitation of underground water; the increasing development of land and water resources threatens to exacerbate land-subsidence problems.

Status: The United States does not have an official population policy, in part because population density is low in the United States, and large regions of the country are sparsely populated. The United States also has no specific policies to modify the spatial distribution of the population. In addition, there is little public consensus about either the need for population-based policies, or their nature.

Capacity-Building, Education, Training and Awareness-Raising: The Office of Population Affairs (OPA) within HHS provides resources and policy advice on populations, family planning, reproductive health, and adolescent pregnancy issues. In addition to providing contraceptive and related health care services, a nationwide network of Title X-supported clinics also provide public education and outreach within the local community, as well as education through individual counseling and printed materials. The program also supports training for clinic staff. Women retain a key role in each of the major U.S. domestic and international agencies concerned with population and sustainable development, and constitute more than 50% of the staff of some units with management

responsibilities in these areas. A number of key steps have been taken to involve women at all levels in programs supported by USAID.

Information: The OPA clearinghouse collects, develops, and distributes information on family planning, adolescent pregnancy, abstinence, adoption, reproductive health care, and sexually transmitted diseases, including HIV and AIDS. The National Women's Health Information Center (<http://www.4woman.gov>) provides information and linkages to women's health related activities of HHS, other federal agencies, and nearly 2000 NGOs. The toll-free and TDD telephone numbers are: 1 800 994 9662/TDD 1 888 220 5446.

Research and Technologies: Through the National Institute of Child Health and Development and National Institute of Aging, the National Institutes of Health sponsor research and training on demographic processes and their implications for sustainable development. Funding is available for research and training both within the United States and in other countries.

Financing: Established in 1965 as Title XIX of the Social Security Act, Medicaid is a joint federal-state program that reimburses health care providers for services rendered to low-income individuals (see also Chapter 3). As a major source of health coverage for low-income women of childbearing age, the Medicaid program plays an important role in financing family planning service and supplies for millions of women. All states participating in Medicaid are required to include coverage for family planning as a benefit and the Federal government pays nine dollars for every dollar a state spends on family planning services.

Cooperation: U.S. population assistance has been provided through both bilateral and multilateral channels under Foreign Assistance Act. USAID is the principal organization responsible for carrying out U.S. population assistance programs. The United States works multilaterally through the United Nations Population Fund (UNFPA), which supports family planning and reproductive, maternal, and child health programs in about 60 countries, many of which do not receive direct assistance from the United States. The Summit of the Americas, The International Research and Training Program, Multilateral Development Banks are examples of bilateral and multilateral programs as is the U.S. -Japan Common Agenda that began in July 1993.

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CHAPTER 6: PROTECTING AND PROMOTING HUMAN HEALTH

Decision-Making: Decision-making on federal policy and programs on human health issues are arrived at through the deliberations of the Congress in consultation with the Administration. Key federal agencies involved include the various agencies of the Department of Health and Human Services (HHS), the U.S. Environmental Protection Agency (EPA), and others. Major groups play an active role in debate on health care issues at the federal, state, and local levels. *Healthy People 2010*, launched in early 2000 by HHS, is the current initiative that outlines a comprehensive, nationwide health promotion and disease prevention agenda for the first decade of the 21st century. Its two overarching goals are to increase the quality and years of healthy life and to eliminate health disparities. It contains 467 specific objectives to improve health and specific statistical measures to evaluate progress.

Programmes and Projects: The major federal programs serving children and pregnant women are Medicaid (see also Chapter 3), the Maternal and Child Health Block Grant Program, the Special Supplemental Food Program for Women, Infants, and Children, the Health Center and Ryan White CARE ACT Programs. The family planning program established in 1970 by Title X of the Public Health Service Act is the only federal program devoted solely to the provision of family planning services on a nationwide basis. Funding from several other public programs also support family planning services. For the goal of reducing smoking, the United States has adopted a combination of measures, including regulating smoking in public places, and increasing taxes on tobacco. Most recently, a National AIDS Policy Coordinator at the White House was named to facilitate implementation of federal AIDS control programs. Additional important federal health programs are sponsored through HHS agencies and offices: the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Health Resources and Services Administration (HRSA), the Food and Drug Administration (FDA), the Indian Health Service (IHS), the Substance Abuse and Mental Health Services Administration (SAMHSA), the Administration on Children and Families (ACF), and the specialized offices within the Office of Public Health and Science (OPHS). The USDA Food and Nutrition Assistance programs work individually and in concert to provide a nutrition safety net for children and low-income adults. For example, the Food Stamp program assists low income families to bring nutritious food; The Women, Infant and Children's Program improves the health of women, infants, and children by providing supplemental foods, nutrition, education, and access to health services; and the Food Distribution program, strengthens the nutrition safety net through commodity distribution and other nutrition assistance to low-income families, emergency feed programs, Indian Reservations, and the elderly.

Status: According to the U.S. National Report to the International Conference on Population and Development in the early 1990's, one-tenth of the non-elderly were covered by Medicaid, a federal insurance program for the poor. A total of 9.5 million children and an estimated 17 percent of all non-elderly people were without any health insurance. HIV infection and AIDS has become a national priority for disease prevention.

Capacity-Building, Education, Training and Awareness-Raising: Numerous HHS agencies include education and awareness-raising in their activities, especially for disease prevention and public health education. These are often aimed at specific population sub-groups, especially those at most risk. NIH provides capacity building and training of scientists for research both in the United States and abroad. The scope of training opportunities is broad, covering all areas of biomedical and behavioral research. Building capacity for biomedical and behavioral research in developing countries is a special emphasis of the NIH, working primarily through the Fogarty International Center and its programs to support advanced training in areas of global health priority.

Information: There are several online sources of useful information from the HHS. www.health.gov is a portal to the Web sites of a number of multi-agency health initiatives and activities of HHS and other Federal departments and agencies. Among these, Healthfinder® (<http://www.healthfinder.gov/>) is a free guide to reliable consumer

health and human services information, developed by HHS. Healthfinder® can lead consumers to selected online publications, clearinghouses, databases, web sites, and support and self-help groups, as well as government

agencies and not-for-profit organizations that produce reliable information for the public. Also, and referenced above, *Healthy People 2010* (<http://www.health.gov/healthypeople/document/>) and the related *Leading Health Indicators* (<http://www.health.gov/healthypeople/LHI/>) provide information on the U.S. national prevention agenda. A final illustrative example of health information from HHS is from NIH, which maintains a Health Information Index website found at www.nih.gov/health/. It contains links to information on a broad array of health topics and the NIH Institutes that work on them, Consumer Health Publications that include fact sheets, brochures and handbooks on various health topics, MEDLINE Plus which contains a health database maintained by the NIH's National Library of Medicine, and the "NIH Word on Health" that contains articles on health maintenance and prevention. The Food Assistance and Nutrition Research Program (FANRP) at ERS addresses the research needs of the Nation's food assistance and nutrition programs. FANRP research analyzes diet and nutritional outcomes and well being of needy American, food program targeting and delivery, and program dynamics and administration. These programs include the Food Stamp Program; the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); and child nutrition programs, such as National School Lunch and School Breakfast Programs. FANRP research on food assistance programs is designed to meet the critical information needs of the Administration, Congress, program managers, policy officials, clients, the research community, and the public at large. It is conducted through internal research at ERS and through a portfolio of external research. Through partnerships with other agencies and organizations, FANRP also enhances national surveys to maintain a food assistance dimension. Related websites have background information about surveys with which FANRP has been involved. See <http://www.ers.usda.gov>.

Research and Technologies: Through Congressional appropriation to NIH, \$16 billion in 2000 was spent on research and training to improve human health in the United States and abroad. The objective is to increase public knowledge regarding the causes, prevention, and treatment of disease and other health conditions. Greater knowledge and capacity to develop improved health technologies will eventually lead to better health outcomes.

Financing: National expenditures for health care reached an estimated \$900 billion in 1993, which, on a per capita basis, is equivalent to \$3,500 per person per year. The government's share of this spending was almost 44 percent of the total in 1991, and is projected to exceed 50 percent by the end of the decade. By the end of 1993, the federal government had spent approximately \$17 billion in the fight against HIV infection. In fiscal 1999, about one in six Americans received assistance from at least one of these programs.

Cooperation: The United States plays an active role in both regional and international health organizations, including WHO, UNICEF, UNAIDS, and the Pan-American Health Organization (PAHO). The United States also provides multilateral and bilateral assistance to promote and protect human health under the Foreign Assistance Act. USAID is the principal agency responsible for carrying out these programs, providing bilateral assistance for health programs in almost 50 countries. In addition, CDC provides technical support for emergency response and global health prevention programs and activities in countries worldwide; and NIH is the lead U.S. agency to support biomedical and behavioral research and training, working in cooperation with over 90 countries to advance its mission. Information on many of NIH international cooperative programs undertaken by the NIH Fogarty International Center (FIC) can be found at www.nih.gov/fic/. The U.S. Department of Labor is implementing international HIV/AIDS workplace education programs focusing on collaboration among government, business, and labor leaders. Under the Global Food for Education Initiative, USDA donates surplus U.S. agricultural commodities for use in school feeding and pre-school nutrition projects in developing countries. School feeding programs help assure that children attend and remain in school, improve childhood development and achievement, and thereby contribute to more self-reliant, productive societies. In the first year pilot program for FY 2001,

USDA's Commodity Credit Corporation is committing \$300 million for U.S. commodities and transportation. USDA-approved projects are conducted through the UN World Food Program, private voluntary organizations, and eligible foreign governments.

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CHAPTER 7: PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT

Decision-Making: In the National Housing Act of 1949, Congress set a goal of “a decent home in a suitable living environment for every American family.” Ever since that time, this goal has served as the animating principle behind the development and implementation of national policies for housing and the built environment. In the national government the Secretary of the Department of Housing and Urban Development (HUD) formulates recommendations for the key policies in these fields which encourage the private sector to serve as large a role as possible in meeting national goals. HUD works with the different federal agencies to ensure that housing and urban development policies are consistent with other socio-economic and environmental policies of the national government. (It should be noted that the term “human settlements” is not in general use in the United States and many of the U.S. policies outlined in this chapter may be described differently than would be the case in a United Nations study.) The 1997 Census of Governments lists 87,453 local governments in the 50 states, including 3,043 counties and 1,100 cities with populations of 25,000 or more. With this multiplicity of governments and its long tradition of local authority, the challenge facing the United States is to find the proper balance between federal, state, regional and local authorities. The large number of separate local governments in metropolitan areas present coordination challenges as communities work to address regional issues, e.g., transport, environmental, and affordable housing. The primary trend in the United States is for local governments and counties to establish partnerships around key areas of cooperation as a basis for regional cooperation. There is no national policy for land use in the United States; all major land use decisions in the built environment (commercial, industrial and residential) are made by local governments under powers delegated from their state governments. The rights of private property ownership are strongly protected by law and custom and are the key factor in understanding the nature and course of development in the United States. However, the federal government, through numerous incentive programs as well as its legal and regulatory framework, particularly in the environmental field, influences land policy decisions, either directly or indirectly, in both urban and rural areas.

Programmes and Projects: The housing and urban programs enacted by the Congress are administered by HUD, the principle federal agency responsible for programs concerned with the Nation’s housing needs, fair housing opportunities, and the improvement and development of the Nation’s communities. For example, HUD administers housing mortgage insurance, rental subsidy, and homelessness programs; devises anti-discrimination programs to improve access to better housing by various minority populations; and works with state and local authorities, the housing industry and non-governmental organizations to forge public-private partnerships that address many of the key issues shaping life in the urbanized regions. For example, the federal government works through a network of state-chartered local housing authorities, community-based organizations, for-profit and non-profit developers and state and local government. Housing accounts for almost one-fifth of the U.S. economic activity and 30 percent of a household’s monthly income is spent on housing and related expenses. With 67% of the housing stock owner-occupied, homeownership continues to be the single most important source of asset-building and wealth creation in the United States, as well as a significant contributor to neighborhood stability. Public-private partnerships, with government providing mortgage insurance, gap financing and down payment assistance, help to expand homeownership in underserved markets. Secondary market institutions, like Fannie Mae, make credit more widely available in order to create more affordable homeownership opportunities. Strong enforcement of fair housing and fair lending laws has also proved an important complement to national housing programs. Homelessness is addressed through comprehensive, community-based strategies that are aimed at moving homeless persons toward self-sufficiency and into permanent housing.

As only one percent of the total housing stock is publicly-owned and managed, government housing assistance is rendered largely in the form of rental subsidies to families living in privately owned buildings. (Private rental housing units comprise about 32% of the total stock.) The federal and state governments provide a variety of tax credits or other financial incentives to make lower cost housing more accessible. Federal urban development funds are generally distributed in the form of block grants, giving communities a great deal of flexibility and control in

addressing local needs. In all of this work, HUD enforces laws and regulations governing the environmental impact of planning and building projects supported, in whole or in part, by federal funds.

USDA's Cooperative State Research, Education, and Extension Service (CSREES), through the land-grant universities and county offices, offers a broad range of homebuyer educational programs including pre-purchase education, delinquency counselling, maintenance and post-purchase education. The U.S. Department of Agriculture (USDA)'s rural development agency, Rural Housing Service (RHS), oversees housing options for rural residents, rural families, and under-served rural residents, including farm workers, the elderly, and those living in some of America's poorest rural communities. The RHS distributes more than \$4 billion in loans and grants annually to improve housing and community facilities in the nation's rural areas. In 1999 the agency helped more than 67,000 rural Americans purchase or improve their homes, financed the construction of more than 2,100 units of affordable rental housing and built or expanded 620 vital community facilities, including rural schools, libraries, day care centres, police and fire stations. Substantial funding was made available in 2000; see

<http://www.rurdev.usda.gov/rhs/Admin/administrator.htm>

and <http://www.rurdev.usda.gov/rd/nofas/housing122600.pdf>. The Rural Utilities Service (RUS) helps finance electric, telecommunications, and water and wastewater projects, and make loans and grants for rural distance learning and telemedicine projects; <http://www.rurdev.usda.gov/>. Also, most States and many local communities have programs related to sustainable development.

USDA also has several programs that advance sustainable land-use planning and management and sustainable construction industry activities. The Natural Resources Conservation Service (NRCS) administers the Resource Conservation and Development program that involves an innovative federal non-government organization partnership in designated RC&D Areas (about 80% of the United States is included in designated areas). These RC&D Areas develop and implement plans to improve the environmental, economic, and social well-being through projects that help develop sustainable local economies and protect and enhance local land and water resources. The NRCS provides technical assistance to the local nonprofit organization partner to help implement their strategic plans. Projects range from helping to develop and maintain affordable housing to enhancing job skills to developing new businesses based upon readily available local resources. RC&D Areas and their local leaders are noted for their entrepreneurial approaches to addressing local needs. To advance sustainable construction, USDA's Forest Service (FS) research has emphasized development and use of technology that uses small diameter and under utilized tree species; primarily for products that can be utilized in housing construction. New wood composite panel and engineered structural products manufactured from under-utilized trees reduce the need for old growth timber resources. Research, particularly at the national Forest Products Laboratory (FPL) in Madison, Wisconsin, is concentrated on development and demonstration of durable, affordable, energy efficient, and disaster resistant products and systems for wood-frame housing. Recent research also has been conducted on development of standards for use of recycled structural framing lumber, which will sustain domestic and international timber resources. Other research has included evaluation of wood waste, natural fibers of several types, and wood/plastic composites for use in housing products.

The Department of Energy (DOE) has implemented a number of projects to promote more sustainable energy consumption in human settlements. For example, Building America is a public/private partnership designed to help provide energy-saving solutions in household construction. DOE's Rebuild America program helps communities save energy dollars by improving the energy performance of the built environment and incorporate energy efficiency and renewable energy technologies into the design of new facilities. Furthermore, DOE's Weatherization Assistance Program provides energy efficiency services to low-income families and individuals in the United States who might not otherwise have access to emerging energy-saving technologies. Increasing effort is being made at all levels of government toward linking transportation planning with planning for economic development, land-use, growth and improved air and water quality. State and local governments responsible for transportation services and infrastructure must consider land-use in transportation planning. Federal law requires coordination between transportation and air quality planning to identify actions that will be taken to reach ambient

air quality standards. A Federal transportation program is available to fund innovative strategies that incorporate transportation in building livable communities, including better integration of land-use and transportation planning.

A recent guide to the policies, programs, and projects of the U.S. Government on the complex of issues related to human settlements may be found in the “United States-Habitat II Progress Report,” which was prepared for the Special Session of the U.N. General Assembly in June 2001 to review the Habitat Agenda formulated at the Istanbul Conference in June 1996. Following U.N. guidelines, this report covers seven major issues: Shelter, Social Development and the Eradication of Poverty, Environmental Management, Economic Development, Governance, International Cooperation, and Future Actions and Initiatives. The program goals and project summaries of several different federal agencies whose work affects both urban and rural areas are reflected in the report.

Status: In the year 2000, the metropolitan areas (urban counties) of the United States covered 24.5% of the 48 contiguous states and contained 80% of the total population of 280 million. These metropolitan areas (a definition based largely on employment and commuting patterns) were responsible for 85% of the GDP, 84% of employment, and 88% of labor income. The social and environmental consequences of this concentration of population and economic weight are critical to understanding public policy debates on sustainable development. In the 1990s, there was a continued shift of the U.S. population and jobs from central cities to outlying suburbs. Many of these newer-growth suburbs are showing the strains of growth, in the form of long commutes and traffic congestion, overcrowded schools or loss of open space and farmland. Rapid population growth in many metro centers is taking place without adequate consideration for water resource needs and is beginning to create conflicts among the different claimants for use of these water resources. In making the transition to the new global and highly technological economy, cities must find new ways to address the key challenges of affordable housing, balancing economic growth and environmental safeguards, growing social diversity, and continuing decentralization.

In response to these trends, there has emerged a new readiness among local leaders to work together on regional “growth management” strategies to achieve more balanced metropolitan development patterns. In a May 1999 survey by the U.S. Conference of Mayors, 74 percent of cities and suburban communities identified “limiting the negative effects of sprawl on the community” as a challenge facing their communities. City and county leaders, regional council, business roundtables, faith-based metropolitan alliances and other civic stakeholders are fashioning solutions in places as diverse as Boise, Idaho; St. Louis, Missouri; Orange County, Florida; and Chicago, Illinois; and in states such as Maryland, New Jersey, Wisconsin and Florida. State and local governments have purchased conservation easements on more than 400,000 hectares of farmland to prevent conversion to non-agricultural uses. The federal government’s matching grant program has protected close to 30,000 hectares. These initiatives also have been supported at the federal level, through new efforts to expand brownfields cleanup and redevelopment initiatives, and through support for locally-led Partnership for Regional Livability organizations. The federally-supported “Growing Smart” initiative is an interagency, public-private effort managed by the Americans Planning Association (APA) to develop model land use planning and development statutes for use by state governments. Growing Smart is producing a consensus-based legislative guidebook for use by governors and state legislatures on the best of U.S. planning law. HUD has indicated its intention to facilitate a national conversation on growth management issues and help to develop tools that local communities can use to better manage their growth.

EPA has helped support the creation of the Smart Growth Network, a network of architects, planners, government officials, developers, environmental groups and citizen organizations to share information on best practices in housing, land use, transportation, air quality and strategies for protecting open space. The USDA FS has been active in providing technical support for demonstration houses and communities in sensitive landscapes, such as the Southwestern deserts. Water collection and recycling is gaining research emphasis. Currently the FS is a co-sponsor of the 2001 conference in Tucson, Arizona, on “The Sustaining Desert: Building Livable Futures.” This conference addresses concerns about sustaining the Sonoran Desert, both in Mexico and the United States, while accommodating the need for housing a rapidly expanding population in the region.

Capacity-Building, Education, Training and Awareness-Raising: Strengthening the ability of local communities to manage federal funds with increased flexibility and less paperwork and regulation is a major goal of the federal government. There has been a continuing shift from “categorical” programs toward “block grant” programs, which, rather than having the federal government create specific, competitive programs to address individual problems, set broad national objectives and give local governments added responsibility to make choices about how to spend federal funds. This has meant greater choice for local communities in how best to expend federal funds, and at the same time it has increased capacity to address local problems comprehensively.

USDA’s CSREES administers various programs that deal with education, training, capacity building, and awareness-raising in rural areas. Some of these include the 1890 Institution Capacity Building Grants Program; programs to provide education on solid waste, water systems, land fills, green spaces, and programs to help make informed choices about food and lifestyles that support physiological health and economic and social well-being. <http://www.reeusda.gov/1700/programs/programs.htm>. The CSREES Sustainable Housing program addresses issues such as affordable housing, air and water quality, and energy. In cooperation with the land grant university system and partners in the federal government, nonprofits, and the private sector, the Housing and Environment Program focuses on the following programs: “*Healthy Indoor Air for America's Homes*” is a national consumer education program concerned with improving the quality of indoor air in homes including: 1) moisture and biologicals (molds, mildew, dust mites); 2) household products and furnishings; 3) radon; 4) asbestos; 5) lead; 6) tobacco smoke; 7) carbon monoxide; 8) formaldehyde; and 9) asthma. Visit <http://www.healthyindoorair.org/> for more information. “*Healthy Homes*” is an initiative addressing the special environmental health and safety needs of children. This national consumer education program focuses on the following: 1) home air quality; 2) crowding; 3) appliances; 4) drinking water; 5) pesticides; 6) rodents; 7) food safety; 8) pets; 9) noise; 10) insects and pests; 11) fire; and 12) firearms. For more information about Healthy Homes, visit <http://www.uwex.edu/healthyhome>. “*Energy Star*” is a voluntary program sponsored by the U.S. Department of Energy (DOE) and the Environmental Protection Agency (EPA). Partnering with CSREES, the program concentrates on educating consumers about the benefits of high-efficiency in homes, appliances, consumer electronics, office equipment, windows, lighting, and building materials. For more information, visit <http://www.energystar.gov> (see also Chapter 4). “*Home-A-Syst*” is a voluntary pollution prevention program that assists individuals to identify water, air, and other pollution risks on their properties, and developing action plans to prevent pollution. For more information, visit <http://www.wisc.edu/homeasyst>.

The Extension System has a long-standing commitment to disaster-preparedness and recovery through the USDA Emergency Programs and the Federal Response Plan. The mission of the Extension Disaster Educational Network (EDEN) is to reduce the impact of natural and man-made disasters through coordinated interdisciplinary and multi-state research and education programs addressing disaster mitigation, preparation, and recovery. Visit <http://www.agctr.lsu.edu/eden> for more information. For decentralization and community empowerment to work, there must be a strong commitment at all levels of government to partner with civic and private organizations in collaborative planning efforts. Most Federal and State programs have such citizen participation requirements. One example is HUD’s Consolidated Planning process, which requires strong citizen participation for local governments to qualify for housing and community grant funds. Another is the Department of Transportation’s metropolitan planning process under the newly authorized transportation legislation.

Capacity building for locally-based non-profit organizations has expanded, through a combination of state, local and federal programs, or through intermediary organizations funded in part by private foundations. A key part of this effort has been a new commitment to the role of faith-based organizations. The latter have strong roots in their communities and throughout U.S. history have played an important role in providing a variety of charitable services to the poorer households in their neighborhoods. The federal government has strong regulatory controls and enforcement mechanisms to ensure that, when federal funds are expended by local governments, they are spent efficiently, and that communities meet statutorily required national objectives and goals and comply with program regulations. As a result of the implementation of the Government Performance and Results Act of 1993, there has been an increasing emphasis on performance and results as measures of success. At the local level, a similar

change is taking place. In the past, few governments could provide information about the quality of the services they provide or even how much service they provide. Citizens had difficulty in determining if they were receiving value for their tax dollars, and governments had difficulty explaining what they were accomplishing. Increasingly, however, governments are “managing for results,” using performance measurement as a tool for accountability. Using benchmarks, scorecards and other techniques, local governments are now providing citizens with the tools they need to understand how effectively their tax dollars are being spent.

Information: Another important trend has been to increase citizen access to all levels of government through expanded use of information technologies and new models of customer service. The 1990s, with the rapid growth of the Internet, was the decade of “e-government,” allowing citizens to gain unprecedented access to government information and resources, such as information on government housing programs and local property tax assessments. In some states citizens can conduct basic transactions, such as renewing a driver’s license or ordering a birth certificate, over the web. At the federal level, for example, HUD created state-of-the-art kiosks, providing for citizens instant access to HUD’s resources in 91 sidewalk locations in 47 states. At the local level, 93 percent of all local governments report having Web sites. Sponsored by HUD’s Office of Policy Development and Research, HUD USER is a major source of information on housing research studies for government officials, builders, city planners, residential finance groups, community-based organizations and the general public; see www.huduser.org. Several reports and databases are available relating to human settlement development. Recent reports include: Heimlich and Anderson, (2001) “Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land,” AER 803, Economic Research Service, USDA <http://www.ers.usda.gov/publications/aer803/>; and Vesterby and Krupa, Major Uses of Land in the United States, 1997, ERS, USDA and related information on the same WEB site, <http://www.ers.usda.gov/features/sprawl/>. Databases include Major Land Uses, United States, 1997, <http://www.ers.usda.gov/data/majorlanduses/>; the National Resources Inventory, NRCS, USDA, <http://www.nhq.nrcs.usda.gov/NRI/>; and the 1997 Census of Agriculture, NASS, USDA, <http://www.nass.usda.gov/census/census97/volume1/us-51/toc297.htm>.

Research and Technologies: The Partnership for Advancing Technology in Housing (PATH) is the first major technology-based initiative in the U.S. housing industry in several decades; see www.pathnet.org. PATH is designed to stimulate the development and utilization of new technologies that will make American homes more affordable to own and maintain, more energy efficient, more environmentally sustainable, more durable, more resistant to natural disasters, and safer to build. PATH brings together key agencies of the federal government and leaders of the home building, product manufacturing, architectural, engineering, insurance, and financial and regulatory sectors in a coordinated effort to spur technological innovation throughout the American housing industry. USDA’s ADDS program (Agricultural Databases for Decision Support) is a National compendium of peer-reviewed resource and agricultural data bases to support research and decision making. The latest Economic Research Service study on rural development in the United States can be found at <http://www.ers.usda.gov/briefing/IncomePovertyWelfare/>. Some of the topics include rural housing, labor, education, Federal funds, infrastructure and rural development policy, and rural industry. USDA FS established the “Advanced Housing Research Center” at the Forest Products Laboratory (FPL) in 2000. Research at this Center is emphasizing development of wood-based products in new and existing homes that will be more durable, energy efficient, and affordable. A demonstration/test house, constructed in cooperation with forest products industry support, opened October 2001, at the FPL. Forest Service research is expanding, with cooperators at selected field laboratories, to assess urban sprawl and its impacts on natural resources, including: urban ecological conditions in selected cities, urban watershed management, water collection and management in urban centers, and the role of forest vegetation in mitigation and improvement of air quality in 50 major U.S. metropolitan areas.

Financing: HUD’s annual budget of about \$28 billion includes about \$15 billion for housing rental subsidies and about \$8 billion in block grants to states and cities. Each of the fifty states has its own community development programs funded from its own tax revenue, while local governments, using property taxes, also support various

community redevelopment efforts. None of this includes the considerable resources of the private sector--corporate, philanthropic, individual--or the non-profit community-and faith-based organizations, all of which serve to complement government efforts in a variety of public-private partnerships. In addition, USDA's Rural Housing Service (RHS) distributes more than \$4 billion in loans and grants annually to improve housing and community facilities in the nation's rural areas (see above).

Cooperation: USAID works with countries around the world in developing innovative approaches to the sustainable development of human settlements. USAID program goals include increasing access to water, sewer, and waste disposal services; increasing the efficiency and commercial viability of wastewater utilities; introducing proper legal and regulatory frameworks to facilitate the private sector's ability to finance infrastructure; and increasing public participation in decision-making; see www.usaid.gov and www.makingcitieswork.org. HUD is completing a two-year program of post-hurricane reconstruction in six countries in Central America and the Caribbean, concentrating on site planning for disaster mitigation, safe building construction techniques, housing finance, and participatory planning at the community level. HUD is also working with the Mexican Government on housing and community development issues along its common 2000 mile border. HUD has also developed new software using geographic information science (GIS) technology to aid research, planning, and management operations by geo-coding critical data. In order to develop new applications of GIS data for land use planning, HUD supports a program to link five U.S. universities with ten research institutions in Asia, Africa, and Latin America (see www.ucgis.org). The U.N. Habitat Center in Nairobi, which is linked to this GIS project, is the recipient of new U.S. funding to help increase international cooperation on a broad range of housing and community development issues.

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CHAPTER 8: INTEGRATING ENVIRONMENT AND DEVELOPMENT IN DECISION-MAKING

Decision-Making: The National Environmental Policy Act (NEPA) passed in December, 1969 continues to provide a single coherent statement of national policy on the integration of environment and development in decision-making at the federal level. NEPA is perhaps the world’s first statement on sustainable development. It provides a broad mandate for all federal agencies within the United States to create and maintain “conditions under which man and nature can exist in productive harmony and fulfill the social, economic and other requirements of present and future generations of Americans.” NEPA introduced the environmental impact assessment (EIA) to the United States and to the international community as a decision-making process designed to integrate environmental, economic and social concerns. It does this through explicit documented and public consideration of the potential for significant impacts of reasonable and feasible alternatives to a proposed course of action in a transparent process that includes broad stakeholder involvement. (See www.ceq.eh.doe.gov/nepa/nepanet.htm).

NEPA is designed and organized to be implemented on a decentralized basis. First, the Act places accountability for integration on those responsible for a given type of activity. Environmental concerns are therefore clearly made the responsibility of and integrated within the operations of sectoral departments of government and at all levels of activity from the policy and program to the project levels. Second, NEPA also requires that all federal agencies review and comment on actions of other agencies that may have impacts of concern to them. Together with provisions for public participation, this creates a process that engages other departments to provide the broad perspective required for addressing sustainable development concerns. Thus, within the United States, strategic environmental assessment is not designed to be a distinct activity from the EIA process itself. This is somewhat different than the manner in which the concept of EIAs in other nations, where it is often primarily linked to private sector action and at the project level.

Within the Executive Office of the President, NEPA created the President’s Council on Environmental Quality (CEQ) to oversee implementation of NEPA within each department and to help elevate and resolve disputes. CEQ regulations establish consistent minimum requirements for the process. The Environmental Protection Agency (EPA) has a specific mandated role to provide independent public review of all major federal actions that significantly affect the quality of the human and/or natural environment and all Environmental Impact Statements prepared by other Federal agencies. The NEPA process evolved over three decades in response to citizen lawsuits and involvement permitted under the Act and legal rights and procedures governing administrative discretion and public access to justice. Federal agencies have gone far in integrating environmental goals and principles from planning to project execution. The process also ensures that policies and projects affected by the federal government reflect broad perspectives and not just those of a single sector. State and local governments contribute to federal actions through comment. Seventeen States have their own equivalent requirements to those of NEPA, and 14 have a more limited form.

Federal natural resource management is overseen by a number of different agencies in the Departments of Interior, Agriculture, Defense, Energy, and Commerce, among others. Environmental pollution is regulated by the U.S. Environmental Protection Agency (EPA), the National Oceanic and Atmospheric Administration (NOAA), the Department of Justice, and other agencies. While this division of labor has resulted in a clear mission on the part of individual agencies, the current arrangement has at times resulted in the fragmentation of policy approaches. Additionally, although NEPA provides a broad perspective and process for decision-making, it does not provide a context for overriding goal setting related to sustainable development. Even individual environmental statutes cover separate areas of environmental concern without addressing the broadest issues raised by sustainable development. The 1993 Government Performance and Results Act (GPRA) is a new mechanism for improved action based on goal driven programs and enhanced accountability for results. The GPRA requires strategic plans for all agencies containing long-range goals and objectives, as well as performance indicators for all government programs. A number of strategic plans put out by Agencies since 1992, including the National Oceanic and Atmospheric Administration, the Department of Energy, EPA, agencies within the Department of the Interior, and

the Department of Agriculture, emphasize sustainable development as a conceptual framework for their activities. The GPRA requirements enabled EPA and others to work across the federal government, with other government agencies and the public on overall goals for environmental protection and sustainable development.

Private decision-making within the United States is influenced not only by government programs and policies in the use of land and natural resources subject to NEPA, but also through the comprehensive regulatory scheme established through major environmental statutes. See www.epa.gov/epahome/lawintro.htm). Each of these environmental laws includes provisions for systematic environmental assessment, planning, regulation, compliance monitoring and enforcement. These laws are primarily implemented by State and local governments with minimum standards, program requirements and parallel enforcement provided by the federal government led by EPA. Several years ago, EPA recognized that a sole focus on pollution control had been effective in achieving major improvements to air and water quality, but that a prevention focus was essential to address longer-term issues. This became particularly apparent in the complex areas of chemical loading and ecosystem health as well as the synergistic effects of multiple sources of contaminants in urban environments. New public-private partnership programs and incentive schemes were devised to better affect private sector decision-making and change criteria for decision-making. While the application of NEPA provides a context for decisions on a case by case basis, these broader statutory programs for resource and environmental health planning and regulation serve to protect, for example, air, water and land quality as well as ecosystems integrity.

Robust voluntary initiatives, public-private partnerships, as well as community, collaborative and cross-jurisdictional approaches that integrate sustainable development and environmental decision-making, augment the U.S. regulatory framework. For example, through its Partners for the Environment program, EPA collaborates with over 7,000 organizations on voluntary programs to improve their environmental performance. Partners include small and large businesses, citizens groups, state and local governments, and universities and trade associations. (www.epa.gov/partners) At the state and local level, efforts to integrate sustainable development into decision-making include SmartGrowth initiatives, which are designed to incorporate environmental goals into community development decisions (www.smartgrowth.org). Public participation and efforts to facilitate cooperation among interested stakeholders and sectors, which can be carried out in a variety of formal and informal structures, play a key foundational role. Coordinating and collaborating with local governments, regional organizations, sovereign nations, and local entities such as indigenous groups and other stakeholders strengthens the ability of people and societies to meet their sustainable development goals and facilitates public involvement in the policy process. A second example of active stakeholder involvement is technical and financial assistance for national resource conservation and farmland preservation provided through the U.S. Department of Agriculture (USDA) National Resources Conservation Service (NRCS) to states, counties, and individuals in accordance with agreements among federal, state, and local jurisdictions.

Programmes and Projects: Directly following the UN Conference on Environment and Development (UNCED), the United States engaged a specific process to enhance its attention to sustainable development by establishing the President's Council on Sustainable Development (PCSD). The PCSD was a presidential appointed panel of leaders from U.S. businesses, environmental and citizen organizations, Native American groups, and local and federal government officials. The Council advised the President on strategies to achieve prosperity, opportunity, and a healthy environment, and was the only presidential or federal advisory panel charged with recommending policies across the full spectrum of economic, environmental, and social policy issues. Council Task Forces included: Eco-efficiency; Energy and Transportation; Natural Resources Management and Protection; Principles, Goals and Definitions; Population and Consumption; Public Linkage, Dialogue and Education; and Sustainable Agriculture. There are many programs involving partnerships that are administered by a variety of organizations. The Common Sense Initiative, administered by EPA, reflects an example of a targeted approach that emphasized increased attention to partnerships. The Four Corners Sustainable Forests Partnership involves over 50 public agencies at the Federal, State, tribal, and local levels, and private organizations representing businesses and communities, to focus on building linkages between healthy forest ecosystems and healthy communities across the entire region.

This partnership focuses on community-based forest restoration, technical assistance for utilization and marketing activities, public information linking community well-being to ecosystem health, regional networking, and capital lending to forest products businesses to increase employment and diversify local economies. Risks from catastrophic fire and insect outbreaks in forest ecosystems have decreased while the capacity in communities to deal with forest restoration and maintenance needs has increased. Another example is the Beginner Farmers of New Hampshire Program that was organized by the New Hampshire Resource Conservation and Development Council along with conservation districts, university specialists, experienced farmers, and others. This is a “farmer-to-farmer network” for technical assistance and a forum for networking, learning, and sharing.

Status: Resource development on public lands in the United States is subject to planning requirements that provide identification and analysis of a range of alternatives to a proposed project, including the opportunity for extensive public review and comment, in order to ensure that the public and decision-makers are fully informed about the environmental and social consequences of proposed development. In addition, if the action will affect specific resources that have a greater level of legal protection, such as endangered species or wetlands, additional planning and mitigation is required. However, additional gains in efficiency and the quality of decision-making are possible through a greater integration of these processes. In particular, substantial gains can be achieved by providing better access to scientific data for the public and the science community, better explanation of the extent of scientific knowledge and the risks associated with alternative courses of action, and coordination and optimization of science programs implemented by various federal and state agencies.

Indicative of the extent to which U.S. policies and programs seek to integrate environmental, economic and social concerns is the applications of these principles to trade negotiations and the U.S. policy of conducting environmental reviews for certain trade liberalization agreements (see also Chapter 2). The United States believes that environmental reviews are an important tool for identifying possible environmental impacts, both positive and negative, and facilitating consideration of appropriate policy responses to those effects within the context of trade negotiations or through other means. Executive Order 13141 of October 1999 requires careful assessment of the potential environmental impacts of major trade agreements. The Executive Order builds on previous experience with environmental reviews such as, the environmental reviews of NAFTA, the Uruguay Round and the Accelerated Tariff Liberalization initiative for forest products. It requires reviews for three types of agreements: comprehensive multilateral trade rounds; multilateral and bilateral trade agreements; and major new trade liberalization agreements in the natural resource sectors. The goal is to initiate environmental reviews early enough in the process that they can be useful in informing the negotiators. The United States Trade Representative and the Chair of the Council on Environmental Quality to oversee the implementation of this order, and developed implementing guidelines that were finalized in December 2000 and are publicly available (www.ustr.gov/environment See environmental reviews and reports.)

Another application of principles of integration is in the development of the regulatory framework that guides economic activity. Regulatory Impact Analyses are required either by statute or, more recently, by Executive Order 12866 of the President. These assessments measure the economic effects of various proposed regulatory options to achieve an environmental objective. In this manner economic considerations are factored (or integrated) into the environmental decision-making process. In addition, some environmental statutes (such as the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA, see also Chapter 19) require an assessment of tradeoffs between risk mitigation and economic effects (termed risk/benefit tradeoffs). Finally, in cooperation with other federal agencies and through meetings with federal, state, tribal and local officials, EPA has developed a detailed set of measurable national environmental goals in such areas as clean air, ecological protections, safe drinking water, and improved understanding of the environment.

Capacity-Building, Education, Training and Awareness-Raising: The U.S. program includes a major effort to enhance environmental management across federal agencies, state and local governments, the private sector and the general public. In 1993, NOAA was the first federal agency in the United States Government to establish an office dedicated to sustainable development to allow it to better serve as steward of the nation's environmental resources.

There are now several offices in agencies around the government, including EPA and the Department of Agriculture, with missions solely dedicated to this purpose. These offices work within their agencies and with partners inside and outside of the federal government to promote sustainable development solutions to advance awareness of strategic goals, environmental stewardship and environmental assessment and prediction.

Information: Internet and other improvements in communications technology has been used extensively to enhance access to information by the public of the status of the environment, impacts of proposed actions, compliance by specific facilities with environmental requirements, potential risks of individual and cumulative environmental releases and specific chemicals through the Toxics Release Inventory (TRI, see also Chapter 19), Sector Facility indexing project of EPA with detailed information on releases, compliance status and enforcement, and other information tools.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: The United States has had longstanding active bilateral programs with Canada and Mexico individually and, more recently, trilaterally through the Commission on Environmental Cooperation to enhance the regulatory framework for decision-making, enforcement of national laws and cooperation across borders, and to build capacity within the private sector to improve environmental management generally. On a bilateral basis, the United States has major programs to build institutional capacity in other countries for improved decision-making in every region of the globe through USAID, the U.S.-Asia Environmental Partnership, in cooperation with EPA and other departments and agencies and local governments with essential expertise. These programs focus on ways to assist local adaptation and sustained implementation of internationally accepted principles for environmental management and governance, including those related to environmental impact assessment and review, the development, compliance and enforcement of environmental law, public access to information, decision making and justice, and advances in environmental management and prevention within the public and private sectors. On an international scale, the United States has worked in partnership with other governments, international organizations and NGOs in developing principles for environmental compliance and enforcement, training and capacity building programs, the International Network for Environmental Compliance and Enforcement. The United States has taken leadership within the G-8 to enhance compliance and enforcement of provisions implementing multilateral environmental agreements (MEAs).

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CHAPTER 9: PROTECTION OF THE ATMOSPHERE

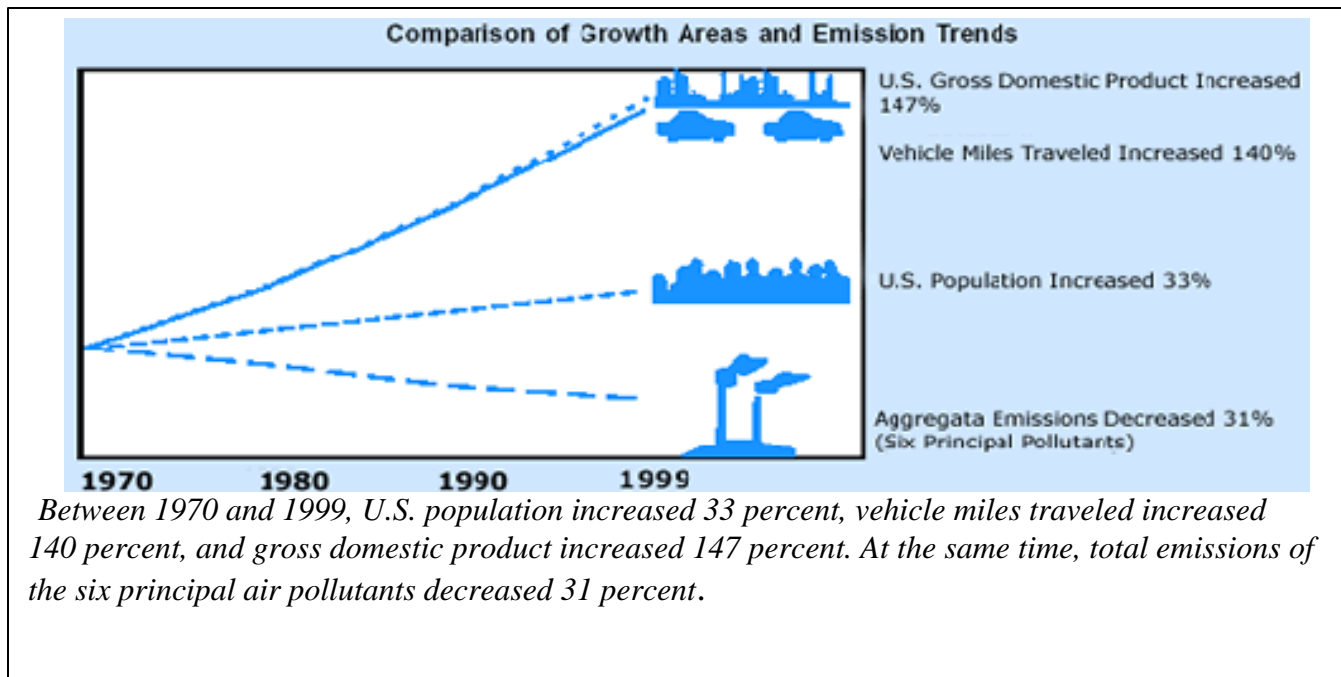
Decision-Making: The United States Environmental Protection Agency (EPA) is the primary government agency responsible for addressing air pollution nationwide, working with the states, tribes, and local governments. The National Oceanic and Atmospheric Administration (NOAA) is the principle government agency responsible for assessment and prediction of the weather, climate, and space environment and provides a national resource for efforts to protect air quality. The United States Clean Air Act provides the principal framework for national, state, tribal, and local efforts to protect air quality. Specific language in the Clean Air Act identified land management agencies, such as the Department of Agriculture (USDA) Forest Service and U.S. Department of Interior (DOI) National Park Service, as being responsible to protect wilderness and park ecosystem from air quality impacts. Several agencies and Departments have responsibilities on global climate change, including EPA, the U.S. Department of Energy (DOE), the Department of State, USDA, NOAA, and USAID. The National Environmental Policy Act (NEPA) also requires the federal government to disclose the potential of planned federal actions to cause degradation of the atmospheric environment. The NEPA, along with specific provisions of the Wilderness Act of 1964, has caused agencies such as DOI's Bureau of Land Management to modify federal minerals management decisions to protect the atmosphere. Additionally, agency enabling legislation such as the Federal Land Policy and Management Act (FLPMA) and the National Forest Management Act (FMFA) require agencies to consider the protection of air quality on the public lands in all management practices.

Programmes and Projects: *Air Pollution* - Under the Clean Air Act, EPA, working with other federal agencies, States and local governments, is responsible for:

- Setting national ambient air quality standards (NAAQS) for the six principal pollutants that are considered harmful to public health and the environment – carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide;
- Ensuring that these air quality standards are met (in cooperation with state, tribal, and local governments) through national standards and strategies to control air pollution emissions from vehicles, factories, and other sources;
- Reducing emissions of sulfur dioxide and nitrogen oxides that cause acid rain;
- Reducing air pollutants such as particulate matter, sulfur oxides, and nitrogen oxides that can cause visibility impairment across large regional areas, including many of the nation's most treasured parks and wilderness areas;
- Ensuring that sources of toxic air pollutants that cause or may cause cancer and other adverse human health and environmental effects are well controlled, and that risks to public health and the environment are substantially reduced;
- Reducing pollution from motor vehicles, including cleaning up fuels, cars, trucks, buses and other motor vehicles, as well as transportation policy changes that can help reduce air pollution; and
- Limiting the use of chemicals that damage the stratospheric ozone layer in order to prevent increased levels of harmful ultraviolet radiation.

Special programs are available to help communities meet national air quality standards, improve cultural and environmental qualities, plan for environmentally-friendly development, purchase cleaner mass transit vehicles, and improve access to jobs. Fuel economy standards for light-duty vehicles, set by the Corporate Average Fuel Economy Program, have led to more fuel-efficient vehicles which emit fewer pollutants. EPA emissions standards for light and heavy-duty highway vehicles have resulted in substantial reductions in vehicle emissions, and new standards will lead to further reductions. EPA has also set standards for emissions from locomotives and other mobile sources.

Since the Clean Air Act was put in place in 1970, the United States has seen emissions of each of the six principal



pollutants decrease (see figure above), with the exception of NO_x. Between 1970 and 1999, emissions of NO_x increased by 17 percent. The majority of this increase can be attributed to heavy-duty diesel engines and coal-fired power plants. EPA has major initiatives in place to reduce emissions of NO_x considerably from these sources. Since implementation of the U.S. acid rain program in 1995, there have been dramatic reductions (10 to 25 percent) in sulfates deposited in many of the most acid sensitive ecosystems located in the Northeastern United States. Estimates of nationwide air toxic emissions have dropped approximately 23 percent between 1990 and 1996. Scientific evidence shows that efforts taken to protect the stratospheric ozone layer have been effective to date. In 1996, measurements in the upper layers of the atmosphere showed concentrations of methyl chloroform had started to fall, indicating emissions had been greatly reduced. Concentrations of other ozone-depleting substances, like chlorofluorocarbons, are also beginning to decrease.

While the national trends continue to improve, air quality trends for some areas, including rural locations, have actually worsened. Some national parks, including the Great Smoky Mountains and the Shenandoah, have high air pollution concentrations resulting from the transport of pollutants many miles from their original sources. These conditions led to EPA implementing the Regional Haze Rule in 1999 to improve visibility, or visual air quality, in 156 national parks and wilderness areas across the country. Due to visibility data collected by EPA and the National Park Service, there is growing concern that visibility in the parks and wilderness areas is being degraded and that the national goals for visibility will not be met by 2064, as the Clean Air and regulations require. For further information on U.S. air quality, look at the EPA's website and the report: Latest Findings on National Air Quality : 1999 Status and Trends (<http://www.epa.gov/airtrends>)

Climate Change: In June of 2001, President Bush announced the interim results of a Cabinet-level review of current climate science and the United States climate policy and program to address the issue of climate change. The review outlined areas supported by science, and significant gaps in understanding climate science. The United States is guided by several basic principles as it analyzes various options: (1) be consistent with the long-term goal of stabilizing greenhouse gas concentrations in the atmosphere; (2) be measured, as more is learned from science and build upon it; (3) be flexible to adjust to new information and take advantage of new technology; (4) ensure continued economic growth and prosperity; (5) pursue market-based incentives and spur technological innovation; and (6) be based on global participation, including developing countries. Based on these principles, the President announced two new climate initiatives in July 2001: (1) U.S. Climate Change Research Initiative; and, (2) U.S. Climate Change Technology Initiative. Additionally, the President signaled his strong commitment to promoting cooperation on climate change in the Western Hemisphere and beyond. The details of these programs are under discussion.

The United States maintains a number of ongoing efforts to address the build up of greenhouse gases in the atmosphere. DOE implements Section 1605 of the EPACT, which calls for the development of a greenhouse gas inventory, as well as provides the foundation for a voluntary reporting program for greenhouse gas emissions. The Voluntary Reporting of Greenhouse Gases Program, created under Section 1605(b) of the EPACT, affords an opportunity for any company, organization or individual to establish a public record of emissions, reductions, or sequestration achievements in a national database. Reporters can gain recognition for environmental stewardship, demonstrate support for voluntary approaches to achieving environmental policy goals, support information exchange, and inform the public debate over greenhouse gas emissions. In 1999, EPA's voluntary programs reduced greenhouse gas emissions by 44 million tons of carbon, equivalent to eliminating the greenhouse gas emissions from about 35 million cars. By investing in products that use energy more efficiently, consumers and businesses have also saved more than \$4 billion on their 1999 energy bills while achieving these environmental benefits. The USDA Forest Service has ongoing global change and carbon management research programs with the goals to: 1) quantify carbon fluxes and stocks, 2) understand and predict biological and ecological processes in carbon allocation and storage, and 3) develop and demonstrate management systems to mitigate greenhouse gas emissions.

USDA Natural Resources Conservation Service Cooperating Scientists are currently engaged in the development of tools to manage odours from animal production facilities and to evaluate the potential of American farmers to engage in activities to sequester carbon in soil and plants, and reduce nitrous oxide and methane emissions from agriculture. The team has pioneered an approach for Phase I: State Level Assessments and Phase II: County Level Assessments of current and potential soil carbon changes, using a combination of resources databases, geographic information systems (GIS), ecosystem simulation modelling, field experiments and soil measurements. A key feature of the assessment technology is the Century model, developed at the Natural Resource Ecology Laboratory in Colorado over the past 20 years, widely acknowledged as one of the most widely used and advanced models of soil carbon dynamics in the world. The objective is to develop an integrated system for quantifying current and future potential of carbon sequestration and greenhouse gas mitigation on the agricultural lands of the U.S. and to make this system and the analysis capabilities available to land managers. Other successful programs include the Climate Challenge, a joint voluntary effort between DOE and the electric utility industry to reduce, avoid or sequester greenhouse gas emissions. Projected emissions reductions attributed to the program through 2000 were 47.6 million metric tons of carbon equivalent. Companies continue to report their emissions reductions activities under the 1605B program mentioned above. For a listing of related public-private partnerships and consumer information, see: <http://www.energy.gov/efficiency/index.html>.

Another example of this public-private partnership approach to addressing climate change is the ENERGY STAR Program, jointly administered by DOE and EPA. ENERGY STAR enables businesses, organizations, and consumers to realize these cost savings and the environmental benefits of energy efficiency investments through a straightforward market-based approach. The ENERGY STAR label clearly identifies which products, practices, new

homes, and buildings are energy efficient—offering lower energy bills and environmental benefits. It appears on products ranging from computers to refrigerators to televisions. Sixteen hundred product manufacturers use the ENERGY STAR label on more than 30 different products. The President’s energy plan calls for the expansion of the ENERGY STAR program.

- Recent figures show that ENERGY STAR commitments have prevented 1.2 billion lbs. of carbon dioxide and will provide cumulative energy bill savings of \$60 billion through 2010;
- Consumers are saving \$4 billion a year by using ENERGY STAR products in their homes and businesses;
- In 2000 alone ENERGY STAR products and practices saved almost 10,000 megawatts of peak summer demand. At the same time these savings eliminated greenhouse gas emissions equivalent to the emissions from 10 million cars; and
- For more information on ENERGY STAR, see <http://www.energystar.gov>.

Stratospheric Ozone Depletion Program - As part of the United States commitment to implementing the Montreal Protocol, the U.S. Congress amended the Clean Air Act, adding provisions (Under Title VI) for protection of the ozone layer. Most importantly, the amended Clean Air Act required the gradual end to the production of chemicals that deplete the ozone layer. To implement the Clean Air Act, EPA has created several regulatory programs to address numerous issues including:

- Ending the production of ozone-depleting substances;
- Ensuring that refrigerants and halon fire extinguishing agents are recycled properly;
- Identifying safe and effective alternatives to ozone-depleting substances;
- Banning the release of ozone-depleting refrigerants during the service, maintenance, and disposal of air conditioners and other refrigeration equipment;
- Requiring that manufacturers label products either containing or made with the most harmful ozone-depleting substances.



With input from industry groups, environmentalists and the public, EPA has published a range of regulations for the protection of the ozone layer. Because of their relatively high ozone depletion potential, several man-made compounds, including chlorofluorocarbons (CFCs), carbon tetrachloride, methyl chloroform, and halons were targeted first for phase out. EPA is developing additional regulations under its ozone protection program for the continued protection of the environment and public health. For more information on EPA’s stratospheric ozone work, see <http://www.epa.gov/ozone>. The USDA Cooperative States Research Education and Extension Service (CSREES) has developed a program to measure UV-B levels, as a support to the Stratospheric Ozone Depletion Program, at 28 rural sites whose data can be accessed at: http://uvb.nrel.colostate.edu/UVB/home_page.html.

Transboundary Transport of Air Pollution - Many air pollutants remain in the atmosphere long enough to be transported over intercontinental distances. Four categories of pollutants have implications for human health, global climate, regional environmental quality, and sustainable development: Ozone and ozone precursors; Airborne particles; Mercury; and Persistent Organic Pollutants (POPs). Much of the U.S. research on this topic is coordinated with the international research community and their efforts through the International Global Atmospheric Chemistry Project (IGAC). U.S. federal coordination is achieved through the Global Change and the Air Quality Research subcommittees of the Committee on Environment and Natural Resources (CENR) and the U.S. Global Change Research Program (USGCRP) (see: <http://www.usgcrp.gov>).

NASA provides nearly continuous global observations of tracers of long-range transport through the space-based missions of its Earth Science Enterprise, which emphasize large regional and global-scale phenomena, seasonal and longer period responses leading to irreversible changes, processes with significant impacts or large uncertainties, and capability to model the present state and variations of the global environment. Examples include NASA’s

Total Ozone Mapping Spectrometer (TOMS), which has provided global total column ozone measurements since 1978 once per day over the total globe. TOMS can also provide aerosol distributions on the same time and space scales as the ozone distributions. Dramatic images of large-scale smoke palls, dust storms, and pollution continue to be obtained through space-based images. NASA has measured the global distribution of CO, an excellent intercontinental tracer of industrial activity and biomass burning, since the early 1980s, first with the MAPS instrument on the Space Shuttle, and presently with the Canadian Space Agency's MOPITT instrument on NASA's Terra platform, and continuing the TES on the Aura Platform in 2004.

NOAA is developing capabilities to better quantify the transport of pollution into and from North America, with a focus on the long-lived pollutants, CO, ozone, and fine particles. NOAA is also engaged in studying the transport, transformation, and fate of air pollution on a global scale. Large forest fires are also contributors to trans-boundary pollution. USDA Forest Service (FS) has active research programs to develop emission factors and emissions inventories for forest fires. Specific work at the Missoula Fire Laboratory focuses on the uses of satellites and computer models to track fire emissions and understand their fate in the atmosphere and can be viewed at: www.fs.fed.us/rm/main/labs/miss_fire.html. USDA Forest Service, NASA and NOAA are conducting research to better understand the contribution of biomass burning to global pollution. To foster additional international cooperation on issues of intercontinental pollution, EPA, with additional contributions from a number of governmental agencies in the United States and Canada, sponsored the First International Conference on the Trans-Pacific Transport of Atmospheric Contaminants in July 2000 in Seattle, Washington. In June, 2001, EPA and Environment Canada co-sponsored a workshop at Columbia University on "Photoxidants, Particles, and Haze across the Arctic and North Atlantic: Transport Observations and Models."

Status: No information available.

Capacity-Building, Education, Training, and Awareness Raising: In partnership with local air quality agencies, EPA has developed the AIRNow website (<http://www.epa.gov/airnow>) to provide the public with easy access to national air pollution information. The website offers daily air quality forecasts, as well as real-time air quality for over 100 cities across the United States, and provides links to more detailed and local air quality websites. EPA has also developed the Air Pollution Training Institute (APTI) to provide training on air quality topics to State and local air agency professionals. To accomplish this, APTI utilizes several different approaches, including Air Pollution Distance Learning Network (APDLN), a digital satellite broadcasting network of over 115 sites in North America and the Caribbean; and 80 Air Quality Learning Centers serving as independent air resources centers. For more information about courses offered and other education and outreach efforts, see <http://www.epa.gov/oar/oaqps/eog/>. EPA and NOAA's National Weather Service jointly sponsor a national UV index education and outreach program to help protect the American public from the health effects of overexposure to UV radiation. The UV index provides a daily forecast of the next day's likely UV levels in 58 cities across the United States. To make sure that UV exposure among children is minimized, EPA sponsors the SunWise program (<http://www.epa.gov/sunwise/index.html>). The United States continues to encourage and support the Global Climate Observing System (GCOS), which has begun to organize regional workshops to identify the capacity-building needs of developing countries with regard to observations. The regional workshops should result in regional action plans for buttressing observation networks in developing areas. The United States provided support for the first workshop covering the South Pacific region in August 2000, including ongoing follow-up efforts, to send an expert on the GCOS Global Surface Network to the East and South African workshop in October 2001, and to support the next workshop focused on the Caribbean and Central America in March 2002.

Information: No information available.

Research and Technologies: The U.S. research program into atmospheric sciences and health effects of contaminants encompasses many government agencies and U.S. universities. NASA, NOAA, the National Institute

of Environmental Health Sciences, and EPA are involved in this research. DOE conducts research and development programs that lead to increased efficiency and reduced emissions.

Earth Observations - Various federal agencies are involved in observations of the atmosphere, especially with regard to climate observing, through space-based and ground-based activities. Space-based, remote sensing observations of the atmosphere-ocean-land system have evolved substantially since the early 1970's when the first operational weather satellite systems were launched. Over the last decade satellites have proven their observational capabilities to accurately monitor nearly all aspects of the total Earth system on a global basis. Currently, satellite systems monitor the evolution and impacts of the El Nino, weather phenomena (e.g., temperature, precipitation, humidity), natural hazards, and extreme events (such as hurricanes, floods and droughts), the ozone hole, solar fluctuations, changes in snow cover, sea ice and ice sheets, wind circulation and speed, forest fire smoke detection and monitoring, volcanic activity and ash alerts, and others. These various observations are used extensively in real-time decision-making and the strategic planning and management of industrial, economic, and natural resources. Examples include weather and climate forecasting, agriculture, transportation, energy and water resources management, urban planning, forestry, fisheries, and early warning systems for natural disasters and human health impacts. Several of the historical data series from operational satellites have been re-processed using substantially improved retrieval algorithms and, therefore, provide good quality global data products for the purposes of climate system variability and climate change research and applications. Improving the on-board capabilities for calibration on operational satellites will be one of the objectives considered in the development of NOAA's National Polar-orbiting Operational Environmental Satellite System (NPOESS) program.

In-situ observations are also required for long time series of observations necessary for the detection and diagnosis of global change, weather and other natural hazards, the emission or discharge of pollutants, and the impacts of multiple stresses on the environment due to human and natural causes. Measurements include surface temperature, precipitation and water resources.

U.S. Global Change Research Program - To better understand global climate science and combine and coordinate the research and policy development interests of several departments and agencies across government, the United States funds the U.S. Global Change Research Program (USGCRP). The USGCRP addresses a series of high priority questions about the natural variability and human influences and their influences on the functioning Earth system. The USGCRP, working with research institutions in the United States and internationally, provides the foundation for increasing the skill of predictions of seasonal-to-interannual climate fluctuations (which can bring excessively wet and dry periods) and long-term climate change. The USGCRP also sponsors research to understand the vulnerabilities to changes in important environmental factors, including changes in climate, ultraviolet (UV) radiation at the Earth's surface, and land cover. *Forest and Rangeland* - The United States forest carbon sink is globally significant. The Department of Interior implements numerous carbon sequestration programs. The Forest Service sponsors and conducts research to improve forest and rangeland management practices, to increase productivity of forests and rangelands, to minimize environmental impacts associated with forest operations, to increase the use of wood products and bioenergy, and to manage carbon in forest products pools. All of these activities provide for more carbon sequestered from the atmosphere, thereby reducing the rate of increase of CO₂ in the atmosphere.

Health Effects - EPA conducts research into the effects of air contaminants on health and the environment, with a specific focus on particles and air toxics. EPA is also conducting research to characterize human exposures to pollution, across the whole of the exposure assessment paradigm from the characterization of the pollutant and its fate and transport to the exposed person or receptor. EPA also researches, develops and demonstrates air pollution prevention and control technologies for manufacturing and processing industries, power plants, incinerators, indoor environments, and sources of greenhouse gases. Research includes characterization and assessment of all sources of air pollution and verification of the performance of innovative technologies. *Applied Research* - DOE is one of the largest sponsors of basic and applied research and development for the nation. DOE supports research, development, demonstration and deployment of technologies across all sectors of the economy that leads to more efficient products and processes and results in the avoidance of emissions into the atmosphere. More information

about energy-related research and development efforts can be found in Chapter 4 of this report or at <http://www.energy.gov>.

Financing: No information available.

Cooperation: The United States is an active participant in multilateral and bilateral negotiations and programs to address atmospheric pollution and other threats globally. Major programs include: *Climate Change* - The United Nations Framework Convention on Climate Change (UNFCCC) was signed in 1992 and is submitting its Third National Communications to the UNFCCC Secretariat. *U.S. Initiative on Joint Implementation*: In October 1993, the United States announced the U.S. Initiative on Joint Implementation (USIJI) to, among other things, encourage the development and implementation of cooperative, cost-effective voluntary projects between United States and foreign partners, especially projects that promote technological cooperation and sustainable development. USIJI now includes 52 projects in 26 countries with potential benefits of 446 million metric tones of CO₂, involving total project costs of approximately \$2.1 billion, \$700 million of which has already been committed. *U.S. Country Studies Program (CSP)*: At Rio in 1992, the United States announced the U.S. Country Studies Program (USCSP) to assist developing countries and countries with economies in transition develop the capacity to address climate change. Since then the USCSP has provided approximately \$45 million in technical and financial support to fifty-six countries for the development of greenhouse gas (GHG) inventories, assessments of their potential vulnerability to climate change, and the identification and analysis of options for limiting GHG emissions and enhancing sinks.

International Cooperation on Climate Technology: The United States plays a key role in the Climate Technology Initiative (CTI), which is a multi-lateral initiative of 23 countries from the Organization for Economic Cooperation and Development and the European Commission. CTI is designed to promote the objectives of the UNFCCC by fostering international cooperation for accelerated development and diffusion of climate friendly technologies and practices. The United States has developed the Technology Cooperation Agreement Pilot Project (TCAPP) to help developing countries design and implement actions to attract investment in clean energy technologies that will meet their economic development goals, while mitigating greenhouse gas emissions. The United States is currently facilitating voluntary partnerships between the governments of Brazil, China, Egypt, Kazakhstan, Korea, Mexico, and the Philippines, the private sector, and the donor community on a common set of actions that will advance implementation of clean energy technologies. The United States also is assisting 14 countries in the Southern African Development Community with a regional technology cooperation needs assessment that was recently initiated by the Climate Technology Initiative.

Inter-American Institute for Global Change Research: The United States supports the Inter-American Institute for Global Change Research (IAI), an intergovernmental organization dedicated to pursuing the principles of scientific excellence, international cooperation, and the open exchange of scientific information to increase the understanding of global change phenomena and their socio-economic implications and to augment the region's overall scientific capacity. With the recognition for the need to better understand the natural and social processes that drive large-scale environmental change, the IAI encourages interactive exchanges between scientists and policy makers. It serves as a helpful source of information of scientific research focused on the Americas' most pressing environmental issues. The information is presented in a useful format that provides an integrated vision of the problems of the region and the opportunity to evaluate options in an intelligent and informed manner.

Long-Range Transboundary Air Pollution Convention - Today, the United States participates with 57 countries in LRTAP including the Russian Federation, the Newly Independent States, Central and Eastern Europe, Western Europe and Canada. The United States is party to the numerous protocols to the LRTAP convention, which establish more specific and legally-binding controls and emission reduction targets for certain air pollutants. Since 1991, LRTAP has been extended by 4 protocols, all of which the United States has signed. *Persistent Organic Pollutants* - In June 1998, the United States, along with other members of the UNECE, signed protocols on persistent organic pollutants (POPs) and heavy metals. Most recently, in December 1999, the United States and Canada, along with European members, signed the LRTAP protocol to Abate Acidification, Eutrophication, and

Ground-Level Ozone. For more information, see www.unece.org/env/lrtap and **Chapter 19. North American Forest Commission** - The North American Forest Commission (NAFC), established in 1959 as a statutory body by the United Nations Food and Agricultural Organization (FAO) Conference, provides a policy and technical forum for Canada, Mexico, and the United States to discuss and address forest issues. Drawing on regional experiences, it also provides advice to the FAO's forestry program. Under the NAFC, a working group on Atmospheric Changes and Forests has been established for protection of atmosphere issues (see www.fs.fed.us/global/nafc/welcome.html).

U.S.-Canada Air Quality Agreement - In March 1991, the United States and Canada signed an Air Quality Agreement, which addresses transboundary air pollution between the two countries. The agreement focuses on acid rain and ozone transport issues, prevention of deterioration of air quality and visibility, development of emissions monitoring systems, notification and assessment of major projects which could affect transboundary air quality and coordinated research activities. Recently, the United States and Canada negotiated an ozone annex to the Air Quality agreement, fulfilling obligations under the LRTAP protocol to Abate Acidification, Eutrophication and Ground-Level Ozone. *International Cooperation on Stratospheric Ozone Depletion*- The Montreal Protocol (1987) was signed by the United States in 1988, the London Amendment (1990) was signed before 1992, and the Copenhagen Amendment (1992) was signed after 1992. The United States has been a major contributor to the Montreal Protocol Fund. *Harmonization of Vehicle Standards* - The United States, the European Commission, and Japan recently negotiated and promoted a Global Agreement for the development of globally harmonized regulations for vehicle safety, environmental protection, energy efficiency and theft protection.

The World Forum administers the Global Agreement, which came into effect on August 25, 2000, for Harmonization of Vehicle Regulations. *Bilateral Development Assistance* - USAID and EPA have collaborated with developing countries across the world on climate change and air quality, with the goal of building capacity and providing information and technical assistance. One of the key emphases of EPA's international projects is the phase-out of lead in gasoline, and EPA has successfully collaborated with countries in all regions of the world on this issue.

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CHAPTER 10: INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES

Decision-Making: The United States has no national land use legislation. The owners, managers, and other decision makers who affect land use share the responsibility for planning and managing land resources in the United States. Nearly 71 percent of land in the United States--about 1.5 billion acres (607 million hectares (ha))--is in private ownership or managed by state agencies, local units of government, and indigenous tribal authorities. The remaining 29 percent (402 million acres/168 million ha) is federally owned and administered primarily by four federal agencies: Bureau of Land Management (BLM), National Park Service (NPS), and Fish and Wildlife Service (FWS) in the U.S. Department of the Interior (DOI), and the USDA Forest Service (FS) (see “Status” below).

Governments depend on easily accessible, nationally consistent maps and images to help make informed decisions about land and natural resource management, economic and community development, environmental protection, hazard mitigation, public health and emergency response activities. Private industry, non-governmental organizations, and citizens also use these products. The U.S. Geologic Survey (USGS) ensures that an integrated, up-to-date map and geographic database for the United States is readily available to a wide variety of users. The USGS performs a lead role in ensuring public access to: high-resolution digital-ortho imagery; civilian satellite imagery; high-resolution surface elevation data; vector data for hydrography, transportation, structures, political and public ownership boundaries; land cover characterization data; geographic names for populated places, physical, and cultural features; and topographic and thematic maps.

The majority of the federal lands are in 12 western states, including Alaska. All federal land is managed in accordance with several U.S. environmental laws, including the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA). Other federal agencies are involved in administering approximately 4 percent of U.S. federal land, including the Department of the Defense (DOD), DOE, USDA, Bureaus of Reclamation and Indian Affairs in the DOI, and others. Collaboration among federal agencies and between state and federal resource management agencies involves technical and financial assistance and includes cost-sharing to leverage private financial resources. The federal government has worked to ensure that federal lands are managed in a sustainable manner through public participation with stakeholders at all levels. States use similar approaches in fulfilling their respective state laws.

Use and management of privately owned land is primarily governed by state, local, or tribal laws, and many state and local jurisdictions have programs aimed at planning and managing land resources. Most states have Best Management Practices (BMP) laws to guide forest landowners. Citizens and civil society organizations are involved in developing and approving these regulations at the state and local levels. In addition to government programs, there are over 1,200 private land trusts in the United States that promote voluntary land conservation and preservation across the country. These organizations provide leadership and training to help protect open spaces, wildlife areas, farmland, and special scenic, historic, and culturally important areas. Lastly, the Federal tax code provides income and estate tax benefits for landowners that donate interests in environmentally valuable land to qualified conservation organizations.

The Federal government can influence use of land through environmental laws, most notably those dealing with water and wildlife habitat. For example, the ESA can constrain the use and development of private land to protect listed plant and wildlife habitat. Government regulations, conservation easements, contracts, or other instruments that arise out of law, custom, and the operation of private markets serve to regulate both landowners' and society's rights to use land. For example, as of 1999, about 105 million acres (43 million ha) of federal lands had been designated a “wilderness” by the U.S. Congress, restricting the use of motorized equipment, construction of buildings and roads, development of commercial enterprises, and other activities. Another 17 million acres (almost 7 million ha) of federal land has been designated as “wilderness study areas,” providing interim protection until Congress makes a final decision on their status. All land managed by the FWS and NPS (about 169 million acres (68 million ha) in 1998) is generally considered to be managed for conservation purposes.

Programmes and Projects: All federal agencies must follow NEPA requirements pertaining to environmental impact analysis related to land use decisions. Federal land management agencies must also follow planning and management laws and regulations. For instance, National Forests and Grasslands are managed by the FS according to the National Forest Management Act (NFMA) (1976) that requires integrated land and resource management plans be developed to provide for multiple use and sustained yield of products and services that flow from them. The NFMA regulations currently being used were initially developed in 1979 and revised in 1982. Since 1989 the U.S. government has been reviewing and proposing changes to the regulations—first to streamline procedures, strengthen relationships, incorporate ecosystem management principles, and clarify decision-making; and now to focus more on sustainability, collaboration, the use of science, and efficient implementation. USDA plans to have new planning regulations in place in 2002. The FS also helps National Forest-dependent communities organize locally, develop strategic action plans, and implement actions to help them become sustainable and self-sufficient. The Department of Interior manages programs for Private Landowner Incentives, Cooperative Stewardship Grants, and Partners for Fish and Wildlife. DOD has both pollution prevention and conservation programs established for lands. DOD installations are required to produce Integrated Natural Resource Management Plans and Integrated Cultural Resource Management Plans for the lands they manage. DOD also maintains two funding programs, a sustainable forest management program for DOD lands and a small-grants program for streamside restoration.

USDA's Resource Conservation and Development (RC&D) Program is a highly successful program premised on a "facilitated self-help" concept. Participation is contingent upon local elected and civic leaders developing a strategic plan addressing land conservation, water management, economic development and community sustainability. Based upon the merits of the plan, the Secretary of Agriculture designates RC&D Areas that become eligible to receive technical assistance in implementing their strategic plans. The plans must be developed with public participation and reflect the issues identified by the local populations. There are 348 designated RC&D Areas nationwide, covering 80 percent of the United States, and nearly 40 applications are pending for designation. Multiple methods are being used by federal agencies to encourage conservation on privately owned land. For example, the federal government through USDA acquires cultivation rights from willing farmers and farmland owners to reduce soil erosion, protect wildlife habitat, and improve water quality, as well as stabilize farm prices, and slow excess production through Conservation Reserve Program (CRP) contracts and Wetland Reserve Program (WRP) easements. The CRP enables private farm producers to bid to retire highly erodible or environmentally sensitive cropland, usually for 10 years. Participants receive rental or cost sharing payments and technical assistance. Almost 34 million acres (14 million ha) were enrolled from 1986 to 1990. As of late 1998, the CRP contained approximately 30.5 million acres—over 12 million ha. The number of idled hectares in the CRP varies greatly by farm production region, with the most participation occurring in the Northern Plains and Mountain states. WRP aims to preserve, protect, and restore valuable wetlands on private property with a voluntary program. It is an opportunity for landowners to receive financial incentives to improve wetlands in exchange for retiring marginal agricultural land. The landowner voluntarily limits future use of the land, yet retains private ownership.

The Nation's private and community forests receive technical and financial assistance through a set of Forest Service State and Private Forestry (S&PF) and Cooperative Forestry programs implemented by State Foresters. Wildland Fire Management programs of S&PF protect life, property, and natural resources on the 192 million acres (78 million ha) of National Forest System lands, on an additional 20 million acres (8 million ha) adjacent to National Forests, and in cooperation with State Foresters on all state and private forestlands. The Cooperative Fire Protection (CFP) program helps address rural fire protection to states and volunteer fire departments across the Nation. The Forest Health Management (FHM) program provides technical assistance to detect, evaluate, and take action to reduce the impacts of insects and disease to improve and restore forest health. The Forest Stewardship (FSP) program helps private landowners plan and execute actions to better manage, protect and utilize their forests. The Urban and Community Forestry (U&CF) program address the stewardship of urban natural resources (where 80 percent of the population lives) by providing resources and information to improve, maintain, and restore trees, forests and green spaces. The Forest Legacy Program (FLP) conserves environmentally important forest areas that

are threatened by conversion to non-forest uses, through conservation easements and other mechanisms. The Economic Action Program (EAP) links people and forests to create stronger, more diverse rural resource-based economies by creating jobs, improving competitiveness and expanding value-added manufacturing of forest resources. Finally, the Stewardship Incentive Program (SIP) provides cost-share support for non-industrial private forest landowners to help them develop and implement their Forest Stewardship Plans. The planning and evaluation requirements of the Forest Stewardship Plan, combined with the broad range of management activities which the SIP program supports, encourage landowners to undertake a variety of forest enhancement and protection activities which otherwise might not be accomplished. More recent legislation provides additional opportunities to assist private landowners. Farm legislation in 1996 authorized the Environmental Quality Incentives Program (EQIP) to provide technical and financial assistance to farmers and ranchers who face the most serious threats to soil, water, and related natural resources, assisting them to make changes in cropping systems; grazing management; manure, nutrient, pest, or irrigation management; land use, or other measures to conserve soil, water, and related natural resources. Federal funding for assessing statewide needs and protecting private forestland from conversion and for providing urban and community forestry assistance was increased in 2000. Private organizations are also significantly influencing land planning and management through forest certification. These organizations include the American Forest Foundation (Tree Farm Program), National Forestry Association (Green Tag Forestry), Forest Stewardship Council, and the American and Forest Paper Association (Sustainable Forestry Initiative).

Federal agencies can assist communities to undertake land and resource planning and management when faced with burgeoning challenges. Government and non-governmental organizations are collaborating to encourage development that better serves the economic, environmental, and social needs of communities through “smart growth” strategies. The Smart Growth Network supported by EPA has members with a wide array of interests, including state and local governments, professional planning organizations, land trusts and developers, and others. The American Planning Association’s (APA) “Growing Smart” initiative, with the help of the Department of Housing and Urban Development (HUD), the Henry M. Jackson Foundation, and others, provides model planning and zoning legislation. USDA is working with many of the same organizations to provide natural resource and socioeconomic assessments and to incorporate “green infrastructure”—the nation’s natural life support system—in local and regional plans. More information about “smart growth” and “green infrastructure” is available on the following web sites: <http://www.smartgrowth.org> and <http://greeninfrastructure.net>.

Status: The Federal government owns and manages 29 percent of the U.S. land base. The BLM administers 264 million acres (107 million ha) or 40 percent of all federal lands, as well as the subsurface mineral rights on approximately 300 million additional acres (121 million ha) of federally owned land. The FS manages a 192 million acres (78 million ha) National Forest System (NFS) lands, consisting of 155 national forests, 20 national grasslands, and 112 other areas. The BLM and FS manage these public lands for sustained yields of multiple uses—livestock grazing, outdoor recreation, timber production, water supply, wildlife and fish habitats, and wilderness. Both agencies decide on uses in land and resource management plans that are prepared by interdisciplinary teams in compliance with a wide range of laws, including NEPA and the ESA. Efforts are underway by the BLM and FS, through their Service First initiative, to deliver improved service to customers, achieve efficiencies in their business operations, and take better care of the land using a landscape approach to stewardship. The FWS manages 93 million acres (38 million ha) in 512 national wildlife refuges, including 198 waterfowl production areas, 50 wildlife coordination areas, and 114 other sites in a “National Wildlife Refuge System” (NWS) to conserve and enhance fish and wildlife and their habitats. The NPS manages 77 million acres (31 million ha) in the 378 units of the National Park System. The three largest units are the (1) National Parks (e.g., Yellowstone and Yosemite National Parks); (2) National Preserves; and (3) National Monuments.

The NPS, FWS, BLM, and other federal agencies, including the FS, cooperate in three management systems. These include: National Wilderness Preservation System (104 million acres/42 million ha); National Trails System (20 trails totalling nearly 40,000 miles); and National Wild and Scenic Rivers System (155 rivers totalling over 10,800 miles/64,800 km). The Bureau of Indian Affairs (BIA) has jurisdiction over more than 56 million acres (23

million ha), of which more than 45 million acres (18 million ha) are under tribal trust and about 10 million acres (4 million ha) are individually owned. The DOI is legally obligated to ensure that American Indian and Alaska Native resources and lands are properly managed, protected and conserved. Mineral resource management is primarily conducted by the U.S. Geological Survey (USGS), which periodically conducts a Federal Energy Assessment. The National Coal Resource Assessment project is a multi-year effort to assess selected coal beds. In addition, the USGS is conducting a re-examination of Alaska North Slope's petroleum potential. Knowing where federal energy resources is located and how much exists helps land managers, planners, and mineral developers make more informed land use decisions. The Office of Surface Mining and Minerals Management Service plays at least as great a role in minerals management than the USGS, which is a science agency, not a resource management agency.

Capacity-Building, Education, Training and Awareness-Raising: EPA sponsors a green community program, including a “Green Communities” assistance kit that helps users to achieve “Green Community” status. A Green Community is one that provides open space, complies with environmental regulations, reduces consumption of natural resources and practices pollution prevention, actively involves all citizens and incorporates local values in decision-making. It encourages all elements of civil society to work together with government to promote a healthy environment, a strong economy and a high quality of life. HUD also uses some of its core programs to support livability and regional development initiatives, including “smart growth” and “brownfields” projects, at the levels of neighborhood, city, region and state. HUD’s strategy is to lead in three dimensions: (1) identify and work to promote livability and effective regional action; (2) add new activities and policies that promote sustainability and equity; and (3) build knowledge and constituencies so that local choices are both informed and responsive to all stakeholders. The FS cooperative programs focus on fire, pests, non-federal land management, and land conservation. All have outreach components that include education and training elements to transfer new technologies, techniques, and technical knowledge to local communities. Cooperative Forestry programs all focus on capacity building of state counterparts to deliver programs and assistance to private landowners. The FS Conservation Education (CE) program is designed to raise public awareness about natural and cultural environment, help citizens to understand complex ecological relationships and conserve natural resources for future generations.

Information: A coalition of developers, planners, government officials, lending institutions, community development organizations, architects, environmentalists and community activists are part of the “Smart Growth Network” (www.smartgrowth.org). This group hopes to encourage more environmentally and fiscally responsible land use, growth and development around the United States. It provides a forum for facilitating smart growth in neighborhoods, communities, and regions. Those who become members of the Network receive a membership kit featuring two primers – one on “Best Development Practices” and “Why Smart Growth.” The group has also produced a video for educating citizen groups or city councils about smart growth concepts and relevant land use and development issues. Information on urbanization, land use change, sprawl, and smart growth also is available on the USDA Economic Research Service (ERS) website (<http://www.ers.usda.gov/features/sprawl>); and the HUD website (<http://www.hud.gov>). The FS has conducted collaborative training sessions “Green Infrastructure” planning (http://www.fs.fed.us/coop/green_infrastructure.htm). NRCS utilizes a variety of electronic and web based information tools and decision support systems to bring natural resource information to local land users to help plan and apply resource conserving practices and systems.

Research and Technologies: Several reports and databases are available related to planning and management of land resources. Recent reports include:

- 1) Heimlich and Anderson (2001) Development at the Urban Fringe and Beyond: Impacts on Agricultural and Rural Land, AER 803, USDA-ERS (<http://www.ers.usda.gov/publications/aer803>); and
- 2) Vesterby and Krupa, Major Uses of Land in the United States, 1997, USDA-ERS (<http://www.ers.usda.gov/features/sprawl>).

Databases include:

1. Major Land Uses, United States, 1997 (<http://www.ers.usda.gov/data/majorlanduses>);
2. The National Resources Inventory, USDA-NRCS (<http://www.nhq.nrcs.usda.gov/NRI>);
3. Census of Agriculture, USDA-National Agricultural Statistics Service (NASS) (<http://www.nass.usda.gov/census>); and
4. Forest Inventory and Analysis (FIA), USDA-FS (<http://fia.fs.fed.us>).

The USDA Forest Service Research and Development provides science and technology for the sustainable management of our Nation's 747 million acres of public and private forestlands.

(<http://www.nass.usda.gov/census>). In addition, the USGS manages Place-Based Studies (PBS) research programs to provide integrated science for managers seeking to restore natural functions and values of resources and the environment. USGS conducts research and helps resource managers use scientific information to: 1) define the extent of environmental problems and distinguish changes caused by management actions from natural changes; 2) understand ecosystem functions so managers can formulate solutions; 3) create models as tools to determine which proposed actions will effectively solve problems; and 4) develop criteria and a strategy for monitoring the results of management modifications. Currently, the areas under study are the San Francisco Bay/Delta, South Florida, the Chesapeake Bay, the Platte River, the Greater Yellowstone area and the Mojave Desert. USGS designed the Mojave Clearinghouse Network, provided much of the data, and served as science advisor to the program. The Mojave Clearinghouse Network was established with a main node at Ft. Irwin using Internet protocols compliant with National Spatial Data Infrastructure guidelines.

Financing: A wide array of funding programs, totaling millions of dollars, exists within the federal government to accomplish diverse resource protection. Programs of state and local governments complement federal spending. Under the Government Performance and Results Act of 1993, federal agencies must develop long-term strategic plans and annual performance plans. The purposes of the law include improving program efficiency and effectiveness and increasing congressional oversight of spending decisions. Land management agencies have begun to coordinate their planning to achieve performance goals that will be accomplished by actions on the ground.

Domestic Financing—A natural resources example: Delineating the numerous ways that sustainable development is financed at the federal, state and local levels is beyond the scope of this profile, as is enumerating the sources of such financing, including government (federal, state and local) funds, private-public partnerships, and charitable organizations. However, an example of government revenues generated by a natural resource illustrates one mechanism used to fund programs that support sustainable development objectives. Oil and gas receipts collected by the Minerals Management Service (MMS) are used to fund a broad range of social and environmental programs. The income generated by oil and gas activities makes it possible for the U.S. to invest in research and development, improved technologies and infrastructure, social programs and public works, and goods purchases. Since 1982, the MMS has distributed approximately \$110 billion to federal, state, and Indian accounts, including: \$69 billion to the U.S. Treasury; \$26 billion to the Land and Water Conservation Fund, the National Historic Preservation Fund, and the Reclamation Fund; \$12 billion to 38 states; and \$3.1 billion to the Department's Office of Trust Funds Management on behalf of 41 Indian tribes and 20,000 individual Indian allottees.)

The majority of government receipts from the Federal leases on the outer continental shelf (bonus bids, royalties, and rentals, now totaling about \$5 billion annually) go to the General Fund of the U.S. Treasury. The revenues are, for the most part, not earmarked for any particular use. However, once in the Fund, the money can be used to reduce the national deficit or to support Federal programs that assist with education, housing, transportation, etc. Some of the mineral receipts are deposited to the Land and Water Conservation Fund (and in the past to the Historic Preservation Fund), which provides grants to State and local governments for recreation and historic preservation projects. The Land and Water Conservation Fund is also a source of funds for Federal land acquisition for national parks, national forests, and other outdoor recreational lands that are being maintained for use by current and future generations.

Cooperation: Cooperation among organizations in the United States occurs at all levels. Efforts to protect and restore watersheds are bringing together landowners, managers, governments, and other citizens to improve natural resources. Nationally, the Departments of Agriculture, Interior, and Commerce are addressing concerns about invasive species through a National Invasive Species Management Plan (see also **Chapter 15**). Two excellent examples of regional cooperation within the United States are the Chesapeake Bay Program and the South Florida Ecosystem Program. The South Florida Ecosystem Program is an intergovernmental effort to reestablish and maintain the ecosystem of South Florida. The program was established in 1995 to assist federal, state, and local resource managers in acquiring an improved scientific information base to resolve or prevent complex resource conflicts and environmental problems caused by development in and around the Everglades, Florida Bay, and the Florida Keys. The Chesapeake Bay Program was established to conserve the character, beauty, and resources of the Chesapeake Bay Region. The Program is working to help local and state governments in the region grow in ways that support sustainable development. More efficient and sustainable development patterns help protect both natural areas and traditional land uses, including farming and forestry. These development patterns are less costly to local governments because they require fewer municipal services, and enhance the quality of life by maintaining open space and conserving historic and cultural resources that are an integral part of community identity. Non-Federal agencies, including state, local, and tribal governments as well as private for-profit and not-for-profit organizations, are playing an ever-increasing role in the delivery of technical assistance and incentives for conservation through public-private partnerships and other joint ventures. As a result, USDA in its September 2001 report on “Food and Agriculture Policy: Taking Stock for the New Century” recognizes the importance of collaboration as a principle for conservation.

Internationally, the Montreal Process exemplifies regional cooperation among countries. Since 1994 countries, with temperate and boreal forests have been working together to develop a comprehensive set of seven criteria and sixty-seven indicators (C&I) for the conservation and sustainable management of forests. The twelve Montreal Process countries, including the United States, are developing national reports on the state of the forests in their own countries using the common criteria and indicator framework. In the United States a national multi-stakeholder Roundtable on Sustainable Forests serves as a forum to share information and perspectives that will enable better decision-making regarding sustainable forests. More information about the Montreal Process and the Roundtable is available on the Internet. (See also **Chapter 11, Programmes and Projects**).

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CHAPTER 11: COMBATING DEFORESTATION

Decision-Making: The United States has a highly decentralized system of government and a mix of forestland ownership, and so examples are used to describe and illustrate the great breadth and depth of work underway by the United States domestically and internationally. About 58% of forests in the United States (174 million ha) are the responsibility of 10 million private owners who account for 89% of the timber harvested annually. The majority of private landowners are non-industrial private forest (NIPF) landowners, for which the 50 states are responsible for guiding and regulating. States as well as tribal governments, counties, cities, towns, and other jurisdictions also own and manage forests. About 33% of forestland (100 million ha) is federally owned and managed by agencies, including: Forest Service (FS) within the U.S. Department of Agriculture (USDA); Bureau of Land Management (BLM), National Park Service (NPS), U.S. Fish and Wildlife Service (FWS), and Bureau of Indian Affairs within the U.S. Department of the Interior (DOI); and U.S. Department of Defense (DOD). In view of decentralized forest regulation and extensive private ownership, the actions of tribal, state, and local governments, NIPF landowners, industry, local communities, land trusts, environmental groups, and other non-governmental organizations (NGOs) have profound effects on the implementation of policies and practices as well as on the progress made domestically towards forest conservation and sustainable forest management.

The FS and BLM are two key agencies responsible for managing federally owned public forestland. The FS manages the National Forests and Grasslands (8.5 per cent of the nation's land) according to the National Forest Management Act, which requires integrated land and resource management plans be developed for multiple use and sustained yield of products and services. In the past decade, management of these lands has emphasized watershed and biodiversity protection (see Chapter 10, Programmes and Projects). Similarly, the BLM manages federal lands within the context of the Federal Land Policy and Management Act using collaborative and multi-jurisdictional approaches to ensure that planning decisions are developed in concert with sustainable development concepts consistent with the mission and goals outlined in the agency's Strategic Plan. Both the FS and BLM are moving toward monitoring long-term social, economic, biological, and institutional trends needed to measure progress.

National legislation significantly affects the management of private and public forests, including the Clean Air Act (1970), Clean Water Act (1972), Endangered Species Act (1973), and Toxic Substances Control Act (1976). These laws require the setting of standards for protection of air, water, endangered and threatened species, and the use of chemicals as part of forestry operations. Except for the Endangered Species Act and the Toxic Substances Control Act, states are given much responsibility for developing and enforcing standards specific to local conditions. Other relevant national legislation revised or enacted during the last decade includes the Forest Stewardship Act of 1990, Cooperative Forestry Assistance Act of 1978, America the Beautiful Act of 1990, National Indian Forest Resources and Management Act of 1990, and National Forest-Dependent Rural Communities Economic Diversification Act of 1990. The U.S. Departments of: Agriculture; Interior; Commerce, Defense (including Army Corps of Engineers); Energy; and Transportation as well as EPA and Tennessee Valley Authority (TVA) are strengthening interagency coordination by adopting a watershed approach to resource planning, analysis, and management. Watershed goals seek to minimize adverse environmental impacts due to management programs, minimize impairment of uses, and restore watershed functions.

Programmes and Projects: Many agencies and organizations administer programs and projects aimed at improving forest conditions and use within their missions. The FS, for example, is guided by its long-term Strategic Plan (2000 Revision) (<http://www.fs.fed.us/plan>) that will for the first time include national scale outcome measures that link to long-term objectives and outcome measures related to the agency's overall goal of sustainable resource management. As stated in its Strategic Plan, the FS mission is "to sustain the health, diversity and productivity of the nation's forests and grasslands to meet the needs of present and future generations." An analytical basis for the FS Strategic Plan is provided by the Resources Planning Act (RPA) Assessment (<http://www.fs.fed.us/pl/rpa>) which reports on status and trends in resource conditions for all the nation's forests and rangelands and is organized around criteria and indicators of sustainable resource management. In addition to

its responsibility for public lands, the FS's State and Private Forestry division assists non-federal forest landowners through Forest Stewardship, Forest Legacy, Cooperative Fire, Economic Action, and Urban and Community Forestry Programs. More and more linkages between resource objectives on federal and non-federal are being strengthened and the roles of tribal, state, and local governments are being clarified. For instance, the Secure Rural Schools and Community Self-Determination Act passed in October 2000 refocuses revenues derived from National Forest System lands that are paid to States and counties for public education and other purposes including sustainable forestry. Also a variety of regional strategies, such as the Northwest Forest Plan, that addressed concerns about the endangered northern spotted owl, offers visions and implementation plans for federal agencies, local forest dependent communities, and others to work together. And collaborative efforts, like the large-scale watershed partnership in the Blue Mountains of Oregon, use community-based approaches to demonstrate innovations and approaches to improve conditions in river basins across ownerships.

Similarly, the Strategic Plan of the Natural Resources Conservation Service (NRCS) includes an important objective to "maintain, restore, and enhance forestland productivity." This helps NRCS administer the Forestry Incentive Program and other conservation programs that include forestry practices. Locally-led processes are the hallmark of NRCS's partnership with Conservation Districts as well as Resource Conservation and Development Councils all across the country. Other agencies including the Farm Services Agency target specific problems through programs like the Conservation Reserve and Conservation Reserve Enhancement Programs to improve water quality, soil erosion, and wildlife habitat by taking land out of agricultural production and planting trees, grasses, and other vegetation.

Currently, a billion-dollar program is tackling the problem of accumulating forest fuels and human settlement in forest areas. The National Fire Plan is a cooperative effort led by the FS, DOI, and National Association of State Foresters (NASF). The BLM and FS are defining and ranking hazards, risks, and values, and are mapping them using Geographic Information Systems; and fuel treatment programs are expanding use of ecologically-based treatments to reduce hazardous accumulations of wildland fuels and reintroduce the use of fire to restore and maintain ecosystem health. Other agencies involved include the National Aeronautics and Space Administration (NASA) that recently deployed the Rapid Response System to provide remotely sensed data on active fires occurring within the United States and across the globe; and the U.S. Geological Survey (USGS), which is examining the effects of wildfires on soil and land cover, water quality, stream sedimentation, soil erosion, mobilization of contaminants, wildlife habitat, and is assessing the increased potential for floods, including debris flows and landslides. In addition, several federal non-forest management agencies implement specific programs to address forest-related concerns. For instance, the FWS implements conservation and management programs for North American forest dwelling neo-tropical birds. The FWS has developed partnerships with dozens of federal and state agencies, private conservation organizations and local governments to restore and manage forest habitats for migratory species.

States also contribute significantly. For example, the NASF and individual State forestry organizations are working with the Federal government to advance sustainable forest management internationally and domestically using the Montreal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests (C&I) as a common framework. In 1999, State foresters completed a review of the implications of using the C&I nationwide by conducting an assessment of data available from State forestry organizations; then organized a national committee to advance C&I implementation by State agencies in more systematic and coordinated ways. The Sustainable Forestry Implementation Committee now seeks to foster more coordination nationwide and build partnerships among State agencies, recognizing that each State has mechanisms in place (e.g., State Stewardship and Urban Forestry Committees) and programs to protect forests from wildfire, insect attacks, and other hazards. Each state, through state resource plans and other assessments, has the potential to bring millions of hectares of NIPF lands under stewardship management.

Significant private sector initiatives by for-profit and not-for-profit organizations are greatly impacting forest management, as are the policies and decisions of major wholesalers and retailers of forest products. Forest management certification systems that have emerged in recent years are being applied to tens of millions of acres. Private, industrial, tribal, state, and municipal forests have been certified under these systems. In addition to

advancing the use of standards for management, and extending professional services to more acres and landowners, forest management certification has raised public awareness of sustainable forest management. Certification programs in the United States include the American Tree Farm System by the American Forest Foundation, Forest Stewardship Council, Green Tag by The National Forestry Association, and Sustainable Forestry Initiative by the American Forest and Paper Association.

Status: The United States is the fourth most forested country, with 8% or 298 million hectares of the world's forests. Private forests comprise 58% of all forestland and 71% of productive forestland that is available for harvest of commercial forest products. Private lands supply 89% of the wood volume harvested in the United States. These forests range from the Douglas fir and Sitka spruce forests of the Pacific Coast to the maple, oak and hickory forest of the North to the expansive pine forests of the South. Since the 1920's the United States has stopped reducing its area of forestland and has experienced a small net increase; however, there are growing concerns about local loss of forest cover, changes in forest quality, accumulating forest fuels, invasive species, and increased forest fragmentation, especially in urbanizing areas. Forest fragmentation includes fragmentation within a contiguous forest block as well as forestlands lost or converted to other uses. Nationally, the average standing wood volume per acre in forests in the United States is about one-third greater today than in 1952: in the East, average volume per acre has almost doubled. In addition, populations of many wildlife species have increased dramatically since 1990; but some species, especially those with specialized habitat conditions, remain a concern.

Capacity-Building, Education, Training and Awareness-Raising: Within the U.S. government many entities are involved in capacity-building, education, training, and awareness-raising activities. USDA's Cooperative State Research, Education and Extension Service (CSREES) educates, trains, and assists private landowners, States, and other practitioners and decision-makers in the conservation and sustainable management of forestlands. Its Logger Education to Advance Professionalism Program (LEAP) promotes silvicultural and environmental education for loggers to better understand the logic and philosophy involved in sound forest management. The FS works with and through NASF to deliver programs to private forest landowners, managers, and other non-federal interests in rural and urban areas. Both the CSREES and FS support university efforts related to sustainability, including those being advanced by the Sustainable Forestry Partnership (SFP) (<http://sfp.cas.psu.edu>). Some of the certification systems also have training programs to help operations learn how to improve forest conditions.

More than 100,000 people have participated in a volunteer ambassador program in which universities and partners provide special training for individuals (often early adopters of sustainable practices) to help them communicate and advance information about sustainable forest management. The partner institutions are relying more on distance learning to meet educational needs of the growing number of private forest landowners. For example, the Master Tree Farmer program involving seventeen state universities has provided one hundred sixty downlink sites to reach more than 2,500 participants.

The commitment of agencies to collaboration serves an important capacity-building function by fostering partnerships and community solutions. For example, the FS helps rural and urban communities through community-based planning and stewardship, by encouraging resource stewardship and conservation on area or watershed basis, by promoting environmentally responsible economic development and jobs based on forest resources, by linking urban-rural concerns about forest health and integrity, and by expanding information, education, and outreach efforts to increase public awareness and understanding of sustainable forest management. Urban ecosystems are vital to the 80% of the U.S. population that now live in metropolitan areas, and are dependent on these ecosystems for their quality of life—water, air quality, and amenity values such as recreation and spiritual renewal. The FS commitment to urban places includes Urban Forest Research that provides the scientific foundation to urban and community forestry policies and practices, and the Urban Tree House program that provides opportunities for environmental education in urban settings where people may not have the chance otherwise. The Urban Tree House program, begun in 1991, is now in five locations—Washington, D.C.; Atlanta, Georgia; Portland, Oregon; Salt Lake City, Utah; and Milwaukee, Wisconsin

(<http://www.fs.fed.us/research/rvur/urban/urbanforestry/urbanforest.htm>).

Private sector landowner cooperatives are promoting sustainable forestry through education as well as the creation of productive, financially rewarding relationships between NIPF landowners and wood product manufacturers. Cooperatives provide a network through which consulting foresters, professional forestry skills, and information are shared. Independent, non-profit organizations, like the Cooperative Development Service in Wisconsin, provide technical assistance and consulting services to forestry cooperatives in Wisconsin, Vermont, and elsewhere with funding from the USDA Rural Business-Cooperative Service. Many NGOs and networks at the national and sub-national levels also have vital and unique roles in increasing knowledge and understanding of forests. The Society of American Foresters (SAF) (<http://www.safnet.org>) is a national scientific and educational organization representing the forestry profession in the United States. It publishes a widely read monthly journal and conducts conferences and workshops aimed at advancing forestry science, education, technology, and practice. In February 2001, the SAF Council adopted a core value statement for the organization related to sustainability and SAF published a Sustainability Guide. The National Wildlife Federation (<http://www.nwf.org>) educates, inspires, and assists individuals and organizations of diverse cultures to conserve wildlife and other natural resources and to protect the Earth's environment in order to achieve a peaceful, equitable and sustainable future. It publishes materials for adults and school children, and its semi-monthly publication "National Wildlife" has a circulation of over 625,000. The American Forest Foundation (<http://www.affoundation.org>), through its Project Learning Tree, has reached and trained over 500,000 educators working with students in pre-kindergarten to grade 12 through grassroots volunteers and state coordinators, who want to help students gain awareness and knowledge of the natural and built environment, their place in it, as well as their responsibility for it. The United States understands the great need for building capacity in countries around the world and sponsors two international seminars on forest management. It also sponsors many of the participants. Additionally, foreign participants are invited to U.S. domestic training courses and seminars dealing with a range of forestry issues.

Information: The Federal government provides comprehensive information on forests in the United States through forest resource assessments and the Forest Inventory and Analysis (FIA) Program. In July 1998, the FS completed its submission to the Enquiry for the UNECE/FAO Temperate and Boreal Forest Resources Assessment 2000, providing data on general forest resources, biological diversity, protection status, wood and carbon supply, forest condition, and socio-economic function of the forests. A national assessment of forest and rangelands (the RPA Assessment at <http://www.fs.fed.us/pl/rpa>) using the C&I was published in 2001. Also through regional assessments, like the Southern Forest Resource Assessment (<http://www.srs.fs.fed.us/sustain>), the FS and others are examining the status, trends, and potential future of forest resources through collaborative efforts. The FS's FIA Program (<http://fia.fs.fed.us>) serves as the Nation's forest census, gathering information on status and trends in forest area, location, and condition. Additional information on private landowners is developed through periodic National Woodland Owner Surveys conducted by FS to increase understanding of private woodland owners and facilitate the planning and implementation of forest policies by characterizing private forestland holdings and management objectives, assessing the flows of market and non-market goods from private woodlands, and measuring participation in federal and state forestry incentive, education, and technical assistance programs to determine sources of management information. Previous surveys were conducted in 1978 and 1994 and a new Survey will be completed in 2004.

During the last two years, through deliberations of the national multi-stakeholder Roundtable on Sustainable Forests (RSF) (<http://www.sustainableforests.net>), the need for Federal agencies to better coordinate data efforts to facilitate work among agencies and with others became apparent. As a result a Federal interagency Memorandum of Understanding (MOU) on Sustainable Forest Management Data was initially signed in October 2000, and now includes twelve agencies committed to collecting, monitoring, storing, reporting, and making data available in more coordinated ways. A new Sustainable Forest Data Working Group of the Federal Geographic Data Committee was chartered in February 2001 to facilitate ongoing coordination needed to report on the state of the nation's forest and tackle data and other information issues related to using the C&I as a common framework in the United States. As part of the U.S. interest in environmental monitoring and assessment, the Council on Environmental Quality sponsored a study on the potential economic and environmental effects of tariff liberalization in the forest sector.

Trade is an important factor in the U.S. wood products industry. The United States is the world's largest consumer of wood products with imports for consumption in 2000 being valued at \$15.4 billion. Domestic exports of wood products in 2000 were valued at \$6.1 billion, making the United States the world's second largest exporter. The U.S. domestic market is by far the main contributor to the health of its wood products industry. Domestic production of wood products totaled \$123.6 billion in 2000. Demand for wood products is primarily a function of the robust U.S. housing market. The FS estimates that plantations currently account for a little more than 15% of all wood fiber harvested in the United States. The agency's preliminary projection shows plantation wood accounting for over 55% of annual harvests by 2050.

Research and Technologies: The FS's Research and Development organization has a professional staff of over 500 people and an annual budget in excess of \$200 million (<http://www.fs.fed.us/research>). It has provided many technologies that conserve the use of wood and facilitate management of the forest resource for many values. Other federal agencies also conduct forest-related research, including NASA (<http://www.nasa.gov>) and the USGS (<http://www.usgs.gov>). Forestry research is conducted at over 30 colleges and universities as well as by forest industry. Through scientific exchange, technical backstopping, and scientific input into international organizations, the United States contributes to cooperative research and demonstration projects on global issues, such as invasive species and global fiber supply.

One national program of particular interest is Forest Health Monitoring (FHM), a cooperative federal and State program designed to determine the status and trends of indicators of forest condition in a consistent fashion in all forest types nationwide. Through the research component of FHM, the government develops and demonstrates new approaches to forest health monitoring in the context of the C&I. Thus it addresses many non-traditional concerns such as invasive species, fragmentation, air pollution injury, and others. Through its assessment capability, FHM produces national, regional, and state-level reports that address the C&I and other aspects of forest health of interest to clients. While the plot measurement component of FHM has recently been shifted to FIA, FHM continues to work with FIA and others to develop indicators and measurement protocols to extend the national plot grid into urban forestland, range/forest ecosystems, and riparian forestland. FHM continues to work closely with FHP and utilizes information from State and federal aerial and ground surveys to more completely assess the health of the nation's forests. While FHM mainly detects emerging problems, short-term projects also are designed to evaluate and resolve the importance of observed phenomena and longer-term intensive research is done to elucidate cause-effect relationships for problems. Depending on the specific indicator and measurement system employed, FHM is now operational on 72% (plot component) and 97% (survey component) of forestland in the 50 states and has produced three national technical reports, three regional assessments, and many State reports.

Introduced invasive species, including the European gypsy moth, Asian long horned beetle, and invasive plants, have negatively impacted forests and require research and control expenditures. USDA's Animal and Plant Health Inspection Service (APHIS) is responsible for regulating movement of plants and plant materials both domestically and against U.S. borders that may carry these and other pest organisms, and for detection and eradication of new pest introductions. APHIS uses biological controls and integrated pest management, including extensive domestic quarantines, to control the spread of highly destructive insects and plant diseases. APHIS also controls wildlife damage and helps protect endangered species. In addition, the FS's Forest Health Protection Staff (FHP) has jurisdiction for suppressing invasive species in forests across all land ownerships, in partnership with the States; and works with APHIS on identifying risk, rapid detection, and response. Once pests are established and eradication is no longer an option, the FHP takes over and tries to suppress or slow the spread of invasive pests like gypsy moth, Asian long-horn beetle, sudden oak death, hemlock wooly adelgid, and white pine blister rust.

In recent years, an increase in private sector funding for forestry research, development, and innovation has led NGOs to become more active. The National Research Council report titled "Prospects and Opportunities for Sustainable Management of America's Nonfederal Forests" (1998) identified seven general areas that pose challenges for future investments in the sustainability of nonfederal forests: 1) long-term forest health and integrity;

2) policies; planning and organizing; 3) programs for the future; 4) investments for sustainability; 5) information needs for decisions; 6) diverse ownership considerations; and 7) the global context. In follow-up several organizations have begun investigating sustainable resource management on non-federal forestlands, including the National Council on Private Forests and the more recently organized National Coalition to Sustain America's Non-Federal Forestlands. The National Commission for Science on Sustainable Forestry, funded mainly by private sources, is developing a science agenda that will contribute to better understanding sustainable forest management efforts. In addition, the National Network of Forest Practitioners (NNFP) has launched an effort to improve the access of people in rural, forest-based communities to research and researchers through its National Community Forestry Center supported by USDA's Fund for Rural America (<http://nationalcommunityforestrycenter.org>).

Financing: Since 1997, federal funding for forest management at the state and federal levels has not increased. With inflation, actual federal budgets have decreased. Although specific data are not available, private sector funding has likely increased substantially over the last decade. Federal, state, and local annual spending on forest management is approximately \$6.4 billion. Internationally, debt reduction and loan/loan guarantee activities are significant. The 1998 Tropical Forest Conservation Act (TFCA) provides for relief of official U.S. debt by eligible tropical countries in return for forest conservation measures. Agreements involving 20 million in debt reduction have been signed with Bangladesh, El Salvador and Belize and several other bilateral agreements are under discussion. The TFCA builds on the 1991 Enterprise for the Americas Initiative (EAI), which links debt reduction and the generation of local funds for the environment and child survival projects in eligible Western Hemisphere countries. The United States has signed agreements with Argentina, Bolivia, Chile, Colombia, El Salvador, Jamaica and Uruguay to cancel \$875 million in official debt owed the United States; Peru signed an agreement to buy back debt owed to the United States valued at \$177 million. Local currency interest payments over the life of the agreements (expected to total \$154 million) will be/are being used within these countries to support child development initiatives, as well as environmental and conservation programs, some of which may be forest related. USAID has provided \$16 million in grants to NGOs for 17 debt-for-nature swaps in Bolivia, Cameroon, Chile, Cote d'Ivoire, Ghana, Jamaica, Madagascar and the Philippines since 1986. These swaps have retired nearly \$100 million in commercial bank debt and generated significant local currency for in-country forest conservation programs. The Overseas Private Investment Corporation (OPIC) and the Export-Import (Ex-Im) Bank of the United States are loan/loan guarantee programs. OPIC supports private U.S. investment in developing countries and countries with economies in transition, including investment in the forest sector, via loan guarantees. These guarantees may be through insured or financed private investment for such projects as reforestation, improved plantation productivity, and forest concession management, or through an environmental investment fund using insurance and guarantee authority. OPIC has adopted a policy prohibiting financing of development projects in primary tropical forests. The EX-IM Bank has Environmental Procedures and Guidelines for evaluating applications for financial support of foreign projects. Forest sector projects, mainly pulp and paper mills, are evaluated for ecological soundness and mitigation measures. Project sponsors are required to develop a forest management plan considering the impacts on water resources, endangered/threatened species, and local communities from construction and operation.

Cooperation: The United States is committed to the conservation and sustainable management of the world's forests, both at home and abroad. In June 1993, one year after the Rio Earth Summit, the United States became the first country to commit to the goal of sustainably managing its forests by the year 2000. Since then, the United States has joined more than 150 other countries in developing national level "criteria and indicators for sustainable forest management." These criteria and indicators identify for the first time the essential components of forest conservation and sustainable management and ways to assess trends in these components, which include the conservation of biological diversity, maintenance of forest health and vitality, maintenance of productive forest functions, soil and water conservation, forest contribution to global carbon cycles, maintenance of socio-economic benefits, and the policy framework needed to facilitate forest conservation and sustainable forest management. The conservation of biological diversity, particularly in the tropics, has become a major focus of U.S. activities and

investments abroad, notably through the USAID, which has undertaken significant conservation programs in Africa and Latin America, as well as parts of Asia.

Bilateral Activities: The United States provides substantial bilateral technical and financial assistance on forests, primarily through USAID. Sections 118 and 119 of the Foreign Assistance Act direct USAID to include tropical forests and the conservation of biological diversity as priority development goals. Today, USAID has a portfolio of 150 forest related projects in 95 countries around the world, including many tropical countries. These projects are undertaken in partnership with local and US-based NGOs (e.g., World Wildlife Fund) as well as government partners. They support a wide range of activities in the areas of forest protection, policy formulation, training and institution building, watershed and related land use management, natural forest management, park and wildlife management, forest regeneration, fuel wood plantations and shelter beds, and species inventory and research.

Numerous federal agencies are involved in programmes and projects that exemplify international cooperation in the forest sector. The FS, working with USAID, Peace Corps, and other government agencies, as well as the private sector and NGOs, carries out numerous programs in other countries, including training and technical assistance in special emphasis areas such as forest assessment, ecosystem management, and fire management and suppression; technical exchanges between US and international forest managers; natural disaster response; and cooperative research and scientific exchanges between US and international scientists. Additionally, the Peace Corps with USAID support, has over 900 Volunteers in 40 countries dedicated to natural resource related projects, including community reforestation, nursery development, agroforestry, park management, and environmental education. The National Science Foundation supports worldwide research on biodiversity and ecosystems. EPA has cooperative agreements for climate change research in Mexico, Brazil, and China. NASA works with other space agencies to improve remote sensing as a tool for forest inventory, for assessment and monitoring in general, and for fire detection, management and suppression; supports an international program called the Global Observation of Forest Cover by funding forest mapping and monitoring projects as well as studies on carbon dynamics in forest systems; and also supports research as part of with Brazil's Large Scale Biosphere-Atmosphere Experiment in Amazonia led by the Ministry of Science and Technology and its National Institute for Space Research. Furthermore, the FWS provides support for forest habitat and species management programs in Latin America and the Caribbean and training programs for managers of protected areas under the Reserve Manager Training Programs, as well as graduate level training, regional outreach institutes, and clearinghouses for information on biodiversity and habitat management in Latin America. And the NPS trains park managers in several countries.

The FS's FIA Program supports several key activities related to developing internationally consistent and compatible approaches to inventory and monitoring. These efforts include provision of resource specialists for the global Forest Resources Assessment (FRA) prepared by the United Nations Food and Agriculture Organization (FAO) and the Economic Commission for Europe (ECE); participation in the FAO North American Forestry Commission (NAFC) to take advantage of opportunities for collaboration and scientific exchange on forest inventory, monitoring, and assessment throughout North America in support of sustainable forest management; and financial and specialist support for the International Union of Forestry Research Organization's (IUFRO) Global Forest Information Service (GFIS), to enhance access to and provision of quality forest-related information, especially that available through electronic media. FIA also has provided inventory training, analysis or inventory design consultation in South America, Central America, Eastern Europe, the Baltics, Russia, and southeast Asia.

The Department of State (DOS) manages the U.S. Man and the Biosphere Program, which develops information inventories on forest flora and fauna in Latin America and other regions of the world. Under the former Special Fund for Global Change Research and International Cooperation, DOS funded a number of bilateral forest inventory, conservation and management projects around the world, primarily in Brazil and Russia. Currently, it supports a modest project fund under the East Asia and Pacific Environmental Initiative. This Initiative's original purpose was to combat haze and air pollution problems, and support forest management projects, in response to the catastrophic fires in Indonesia in 1997. It has since broadened its scope to include other environmental and forest-related projects in the region.

Major International Agreements, Organizations and Initiatives: The United States is active in a wide variety of intergovernmental agreements, organizations, initiatives and other fora that undertake forest related work and policy discussions. Key among them is the new United Nations Forum on Forests (UNFF), established in 2000, which builds on the work of the time limited Intergovernmental Forum on Forests (IFF) and the Intergovernmental Panel on Forests (IPF), and is intended to facilitate coordinated international action on forests. The United States is a member of the 12-country Montreal Process on C&I and hosted the 11th Meeting of the Working Group in November 1999 in Charleston, South Carolina. In 1997, the United States published its First Approximation Report on our institutional capacity to report. Now, the RSF and other stakeholders are working with the federal government on the development of a National Report on the status of the Nation's forests and progress towards sustainable forest management by 2003. The United States inspired the G-8 Action Program on Forests, which world leaders launched at the Denver Summit in 1997 and endorsed a year later. A progress report on implementation of the G-8 Action Program was submitted to leaders at Birmingham in 2000 and a final report will be submitted in 2002. The United States and the United Kingdom co-sponsored a World Bank-hosted international meeting entitled "Forest Law Enforcement and Governance: A Ministerial Regional Conference for East Asia," held in Indonesia in September 2001. The conference strengthened high-level political commitment to combating illegal logging, related illegal trade, and corruption in the forest sector, inter alia through the issuance of a ministerial declaration, which acknowledged the seriousness of forest crime and committed to taking concrete national, regional and international steps to address this issue.

The United States is a party to and has provided voluntary funding to a number of international agreements and conventions, including the International Tropical Timber Agreement, 1994 (ITTA), Convention on Trade in Endangered Species of Flora and Fauna (CITES), Climate Change Convention, Convention to Combat Desertification, Western Hemisphere Convention, and the Convention on Long-Range Transboundary Air Pollution—all of which have forest components or potential implications for forests. The ITTA is implemented through the Yokohama-based International Tropical Timber Organization with the purpose of facilitating discussion, consultation, and international cooperation on issues related to international trade in tropical timber, including sustainable management of tropical production forests. CITES has established an ad hoc Timber Working Group to consider issues related to the listing on CITES Appendices of commercially traded timber species. The UN Climate Change Convention recognizes the potential of forests to act as a carbon sink; and as such the United States, in cooperation with The Nature Conservancy, recently signed an agreement to study how changing forestry practices can effect carbon sequestration in Brazil and Belize. While the United States is not a party to the Convention on Biological Diversity (CBD), the United States has provided funding, which have forest-related mandates and, in the case of the CBD, an initial work program on forests. The United States provides substantial resources for forests, particularly tropical forests, through contributions to international organizations. As a member of the FAO, which is the specialized UN agency with responsibility for forests, the U.S. contributes to global forest assessments, community based forestry, technical assistance, and information gathering and dissemination. Other forest-related organizations and UN agencies supported by the United States include the UN Environment Program (UNEP), UN Development Program (UNDP), Center for International Forest Research (CIFOR), International Center for Agroforestry Research (ICRAF), and the World Bank.

Of special note is the Global Environment Facility (GEF), established in 1991 as a joint effort of the World Bank, UNDP, and UNEP, which funds the "incremental costs" of actions designed to achieve global environmental benefits. Two areas of project funding under the GEF, biological diversity conservation and climate change, directly relate to forests. Also, the G-8 Pilot Program to Conserve the Brazilian Rain Forest is an innovative multi-donor program administered through the World Bank to promote conservation of the Brazilian Amazon and Atlantic Rain Forest. U.S. support for the pilot program is provided through USAID and the DOS. The combination and cooperation between international and national, technical and policy initiatives has provided an action-oriented framework for reaffirming and acting upon the U.S. commitment to sustainable forest management and the spirit of Agenda 21.

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CHAPTER 12: MANAGING FRAGILE ECOSYSTEMS: COMBATING DESERTIFICATION AND DROUGHT

Decision-Making: A significant area of the United States is susceptible to desertification. Estimates of this area are as high as 37%. In addition, as USDA's National Drought Policy Commission reported in May 2000, drought occurs somewhere every year in the United States, and it extends over long periods and large areas. There are a wide variety of Federal agencies involved in combating desertification and drought in the United States. These agencies include the Bureau of Land Management, the Bureau of Reclamation, the Environmental Protection Agency, the Fish and Wildlife Service, the Forest Service, the Geological Survey, the National Oceanic and Atmospheric Administration, the National Science Foundation, and the Natural Resources Conservation Service. In 1998, the US Congress passed the National Drought Policy Act, in order to improve integration and coordination of Federal policies to prepare and respond to drought emergencies. The law established a National Drought Policy Commission to recommend a national drought policy and recommend improvements in Federal coordination of drought programs. The report, sent to the Congress in May 2000, favors preparedness over insurance, insurance over relief, and incentives over regulation. The report, *Preparing for Drought in the 21st Century*, is available at : www.fsa.usda.gov/drought. Numerous Federal, State and local land use plans have been prepared for areas susceptible to desertification. These plans generally fall into three broad categories: functional or sector-specific plans, such as highway construction plans; resource-specific plans, such as plans to reduce soil erosion; and local comprehensive land use plans. As of June 2000, 30 states have formal drought plans, 15 states have no drought plans, 6 states have plans in development, and two states (California and Florida), rather than having statewide plans, require local authorities to have drought plans.

The United States has only recently begun to undertake planning on an ecosystem-wide basis. There are few national or regional plans or strategies to combat desertification. Through its Conservation Technical Assistance Program and Small Watershed Program, the Natural Resources Conservation Service provides technical and financial assistance to private landowners and watershed groups to address a wide range of natural resource issues including mitigation of desertification. Decision-making in these programs is at the landowner level even though the programs are funded nationally. There are a significant number of State, local and tribal units of government and a wide variety of nongovernmental organizations involved in combating desertification and drought. NGO's are advisory participants at the field/grassroots level and participants at national planning and district levels. Women participate regularly at national, district and grassroots levels. Youth are involved in various ways at national or district level planning but are active participants in education programs at the grassroots level.

Programmes and Projects: The United States is not obligated to develop national programs or projects under the Convention to Combat Desertification. Although most programs and projects are developed at the local, district, or regional level, the Federal government does provide assistance through a variety of means. For example, USDA's web site (<http://www.usda.gov>) contains information about financial and other assistance, weather and climate resources, and other resources. USGS provides research and data related to water availability and quality that are critical to local, state, and regional studies related to desertification and drought. In keeping with the principle of preparedness over insurance, the Departments of Agriculture, Commerce, and Interior focus on helping farmers and ranchers defend against drought through good planning, management, and information. Through the partnership, assistance is available from the National Water and Climate Center administered by the Natural Resources Conservation Service and the National Drought Mitigation Center at the University of Nebraska, which includes weekly updates on drought conditions across the Nation. A variety of technical assistance also is available to farmers, ranchers, and communities. For example, through a joint venture of the Forest Service and Natural Resources Conservation Service, the Department of Agriculture supports a National Agroforestry Center in Lincoln, Nebraska, as well as technical specialists in regional locations to help landowners combine agriculture and forestry technologies to create more integrated, diverse, productive, profitable, healthy and sustainable land-use systems. The Center also promotes the modification of agroforestry technologies, like field windbreaks, for use

around communities to provide protection from elements, improve water quality, provide wildlife habitat and aesthetics, and afford alternatives sources of income from specialty products. Field windbreaks protect a variety of wind-sensitive row, cereal, vegetable, orchard and vine crops, control wind erosion, and increase bee pollination and pesticide effectiveness.

Prolonged drought in conjunction with heavy fuel accumulation in forested areas of the country also is threatening the safety of many homeowners and communities. Agencies in the Departments of Agriculture and Interior, along with the National Association of State Foresters, have developed a National Fire Plan to help manage the impact of wildfires on communities and the environment. The assistance includes helping communities be “firewise” by reducing hazards, designing homes and landscapes, and doing effective community planning. Information about financial and technical assistance is available on the Internet (<http://www.fireplan.gov>).

Status: The impact of improper farming techniques, poor land use decisions, natural causes and excessive water withdrawals on desertification is modest due to continued presence of technical and financial assistance to private landowners. Grazing has a moderate impact. Fuel wood collection is insignificant. Improper grazing practices in the 1800's and early 1900's resulted in the degradation of large areas of the western part of the United States. These areas have been slow to recover although improvements have been seen on private grazing lands in this region. In order to address problems identified with desertification, Federal natural resource agencies, in cooperation with State, tribal, and local governments, nongovernmental organizations, and private landowners, are gradually developing ecosystem-based approaches to restore degraded areas. Social, economic and cultural incentives exist so that farmers undertake conservation and regenerative measures. Rangeland Reform '95 reduced grazing fees for good stewardship on federally-owned grazing lands.

Capacity-Building, Education, Training and Awareness-Raising: See **Information and Cooperation**.

Information: There are approximately 25,000 hydrological monitoring stations with good coverage and adequate staff dealing with desertification issues at the Federal and State levels. There is, however, a shortage of trained field-level staff. The Natural Resources Conservation Service maintains a national Natural Resources Inventory that provides statistically valid trend data on land use and natural resource conditions on private lands of the United States. In addition, the Forest Service reports and tracks forest conditions through the Forest Inventory and Analysis and the Forest Health Monitoring programs; and the Economic Research Service periodically does assessments of the impacts of drought on agricultural producers. The Federal Government provides funding for the National Drought Mitigation Center, at the University of Nebraska-Lincoln (<http://enso.unl.edu/ndmc/index.html>) which provides web-based information on topics such as current drought conditions in the US and the world, and state drought plans.

Research and Technologies: Many U.S. land grant colleges and universities and other institutions continue to do basic and applied research related to combating desertification and mitigating the effects of drought. This information is shared through publication in scientific journals, conferences, workshops, public meetings, and other fora. A variety of drought-related research is done by the Department of Agriculture. For instance, the Agricultural Research Service (ARS) focuses on improving crop yields on drought-prone farmland through plant breeding and sustainable farming programs. More information about ARS is available on its web site (<http://www.ars.usda.gov>).

Cooperation: The United States signed the Convention to Combat Desertification in 1994; the Convention entered into force for the U.S. February 15, 2001. The Fifth International Rangeland Congress was held in July 1995. Other major international, regional and bilateral programs active in the United States include: UNESCO's Man and the Biosphere Program (MAB); National Science Foundation Long Term Environmental Research sites; U.S./ Mexico Border Environmental Issues Field Committee; and International Sonoran Desert Alliance. The U.S. Departments of State, Agriculture, Commerce, and Interior, in coordination with other U.S. agencies, actively participated in activities to negotiate the International Convention to Combat Desertification. The Department of

the Interior and the U.S. Environmental Protection Agency, in collaboration with others, cosponsored an International Symposium and Workshop on Desertification in Developed Countries in October of 1994. The departments are currently developing a number of ecosystem-based demonstration projects in the arid and semiarid areas of the United States. The Department of the Interior and the International Arid Lands Consortium, in collaboration with others, cosponsored an international symposium and workshop titled “Combating Desertification: Connecting Science with Community Action” in May 1997.

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CHAPTER 13: MANAGING FRAGILE ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT

Decision-Making: The principal mountain systems in the United States are found on the eastern and western edges, with the Rocky Mountains in the west being the largest mountain chain and the Appalachian Mountains in the east being among the oldest on Earth. Many rural mountain areas in the United States are no longer isolated from the influences of urban America's population growth, sprawl development, and recreation/tourism demands. The United States has a highly decentralized system of government with responsibilities for community development and/or resource conservation shared by federal agencies, states and their respective agencies, tribal governments, and county, municipal, and other units of local government. No federal agency focuses specifically on sustainable mountain development or on mountain regions in isolation from lowland areas; and no one agency serves as the coordinating body within the United States to take a comprehensive integrated approach to sustainable mountain development. However, many federal agencies are responsible for forests, water, mining, agriculture, education, tourism, and other activities; and several manage protected natural parks, forests, wilderness areas, or research areas in ecologically important mountain regions. A notable state example is the Adirondack Park Agency, an independent bipartisan agency, responsible for management and development of 2.5 million acres of public land designated "forever wild" within the 6 million acre Adirondack Park of public and private lands in the mountain and foothill area of upper New York State. In addition, the Appalachian Regional Commission (ARC), established by the U.S. Congress, supports economic and social development in the 13-state Appalachian Region where one in three people was impoverished in 1965 when ARC was created.

The number and diversity of non-governmental organizations in the United States concerned with sustainable development is growing rapidly; a few give special attention to mountain areas. The Appalachian Mountain Club, founded in 1876, is the oldest conservation and recreation organization in the United States. Its mission is to promote the protection, enjoyment, and wise use of the mountains, rivers, and trails of the Northeast; and has a long-term interest in activities along the spine of the Appalachian Mountains. The Mountain Institute (TMI), a non-governmental organization founded in 1971 to advance mountain cultures and preserve mountain environments, has stepped forward to help organize the disparate interests in North America in preparation for the International Year of Mountains in 2002. In April 1997, TMI along with the Pinchot Institute for Conservation and the Center for Resource Management held a planning workshop in Washington, D.C. with support from the USDA Forest Service (FS) to plan a mountain agenda conference for North America. The Lightstone Foundation, a private non-governmental organization founded in 1986, (<http://www.lightstone.org>) serves to strengthen and sustain rural mountain communities in West Virginia and Virginia, with a holistic approach to community-based development that was recognized by the UN FAO in 1998 as a global model for land stewardship and public education. More recently Lightstone received national recognition for its innovative work in fostering sustainable entrepreneurial development.

Programmes and Projects: Several federal agencies are providing leadership and taking actions within various arenas at various scales. The ARC is a unique partnership of federal, state, and local governments in a 13-state region. Its structure helps puts responsibility in the hands of citizens in the Region. Initiatives from local citizens become part of each state's annual overall plan, resulting in a "bottom up" approach to addressing local needs (e.g., water and sewer systems, work force training, adult literacy, health care, and highways). The U.S. Geological Survey (USGS) has a number of studies related to water resources of fragile mountain ecosystems varying from alpine to tropical, and is providing information that should aid in ecosystem management. For example, USGS is using meteorologic, hydrologic, chemical, and isotopic data to help evaluate the impacts of atmospheric deposition and changes in climate on sensitive Rocky Mountain ecosystems. In Puerto Rico, USGS has compared two watersheds in an undeveloped tropical forest preserve managed by the FS with two watersheds in an agricultural and urbanized basin, providing information needed to better understand the effects from human activities and episodic, hydrologic events associated with hurricanes. In addition, through a Western Mountain Initiative, the

USGS is integrating four independently developed biological resource-related research programs. The programs study global change in mountain ecosystems of the western United States to understand how the unique features determine regional ecosystem responses to climatic change and to identify how large mountain systems influence each other. Interdisciplinary teams of university and agency researchers from the USGS, National Park Service, and FS, are conducting research in four areas: Northern Mountain Ecosystems, Northern Rocky Mountains, Colorado Rocky Mountains, and Sierra Nevada.

Over a century ago public concern in the United States about clean water contributed to the establishment in 1891 of federally protected forest reserves now managed by the FS, typically in mountainous areas. Now the FS, with others, is refocusing attention on this original purpose through large-scale watershed restoration partnerships in priority places like the Blue Mountains of Oregon, the Upper Sevier River watershed in Utah, the South Platte River outside Denver, Colorado, the Conasauga and Chattooga River Watersheds in the Appalachian Mountains, and the White River in Vermont with its headwaters in the Green Mountains. Community-based approaches to collaboration across mixed ownerships are demonstrating innovative ways and new approaches to improve watersheds and forest, range, water, and habitat conditions in river basins. Many watersheds are in fire-prone ecosystems where the risk of wildland fires to people, communities, and watersheds has dramatically increased due to overly dense forest vegetation. Now, a cooperative National Fire Plan co-led by the FS, the U.S. Department of the Interior, and the National Association of State Foresters is being implemented. These two efforts link concerns about fire and water. More information is available on the FS web site (<http://www.fs.fed.us>). In addition, USGS assesses the risk of severe flooding and fire-related erosion that results when intense rain falls over small steep watersheds soon after a wildfire. Data indicate, for instance, that fire damage followed by severe flooding and erosion has been an integral pattern of such ecosystems for thousands of years; however, the data also show that the risk to people and property along river channels downstream of burned mountainous watersheds drops considerably only a few years after a fire as new vegetation is re-established and the soil infiltration is increased by wetting, frost action, and animal activity.

The Watershed and Flood Prevention Act, originally passed in, 1954, provides assistance through the USDA Natural Resources Conservation Service (NRCS) for small watershed planning activities and river basin surveys and investigations. The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries. Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance. The focus of these plans is to identify solutions that use land treatment and nonstructural measures to solve resource problems. The associated NRCS Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Non-governmental organizations carry out domestic as well as international work. For example, TMI's (<http://www.mountain.org/>) projects include a global communication network called The Mountain Forum and domestic work in three National Parks (Rocky Mountain, Mount Rainier, and Great Smoky Mountains). In a joint effort with TMI, Lightstone Foundation initiated a comprehensive community-based entrepreneurial development project in four rural mountain communities in West Virginia and Virginia, the Rural Mountain Alliance (<http://www.ruralmountainalliance.org>). Funding support for this project came from a new federal initiative to build and sustain the capacity of rural communities and NGO's, USDA's Rural Community Development Initiative (<http://www.rurdev.usda.gov/rhs/cf/cp.htm>). The Southern Appalachian Man and the Biosphere Cooperative (SAMAB) (<http://samab.org>) promotes environmental health as well as the stewardship and sustainable

development of natural, cultural, and economic resources by encouraging community-based solutions to critical regional issues through partner cooperation, information gathering/sharing, integrated assessments, and demonstration projects. Its projects include red wolf reintroduction, native plants and invasive species, environmental education, community partnerships, and watershed conservation. The Ozark Regional Land Trust (ORLT) is one of the many land conservation trusts throughout the United States. Land trusts are dedicated to helping landowners, including those owning farm, range, and forestland, sustainably manage their land and protect it in perpetuity through conservation easements and other methods. Several base their work in mountain areas of the United States. More information about land trusts in each state, as well as about land trusts in general, is available from the Land Trust Alliance's web site (<http://www.lta.org>).

Status: Currently, no one government or non-governmental entity serves as a convener/coordinator in the United States to comprehensively integrate actions and assess progress at the national and sub-national levels, but many organizations and networks have indicated an interest in aspects of sustainable mountain development. Now the TMI, through the Mountain Forum, is attempting to organize a North American coalition and identify a coordinating unit. They are using the International Year of the Mountains in 2002 as the impetus.

Capacity-Building, Education, Training and Awareness-Raising: Many agencies and organizations assist with capacity-building, provide education and training, and raise awareness of sustainable approaches to community development and resource conservation in addition to those described in other sections. Throughout the 1990s, after passage of the National Forest-Dependent Rural Communities Diversification Act by the U.S. Congress, the FS has increased its assistance to rural communities and businesses dependent on forest-based resources to help them become sustainable and self-sufficient. During the last ten years, a grassroots alliance of rural people, organizations, and businesses has emerged as the National Network of Forest Practitioners with assistance from foundations, government agencies, and others. The Network seeks to find practical ways to integrate economic development, environmental protection, and social justice. Many members are in forest-dependent communities, engaged in a wide variety of work including watershed protection and restoration, ecotourism, job training, non-timber forest products, and value-added wood manufacturing. The Network has grown to include others that support its mission including environmental organizations, rural development specialists and organizations, researchers, facilitators and mediators, and representatives from land management agencies. More information about assisting communities is available on the FS website (<http://www.fs.fed.us>) and the Network web site (<http://www.nnfp.org>).

Information: The U.S. government coordinates the use, sharing, and dissemination of geospatial data on a national basis through the interagency Federal Geographic Data Committee (FGDC) organized in 1990, with the USGS directing the Secretariat Staff. Even though the United States does not generally organize its research, information, and data by mountains, progress is being made. For example, the FS's Forest Inventory and Analysis Program consist of a systematic grid of field samples across all forestlands of the United States. This data set can be queried to develop statistics for polygons containing mountainous regions of the United States. Through the FIA, the FS is working with NatureServe (formerly known as the Association for Biodiversity Information) to develop consistent methods of presenting FIA data by vegetative alliances across broad landscapes. USGS provides information needed by Federal, State, and local agencies for specific purposes. For instance, in Colorado, the Summitville and Leadville mining districts have been the focus of extensive public attention for environmental problems stemming from open-pit mining activities; and both sites have been taken over by EPA under its Superfund Emergency Response authority. USGS provides geologic and hydrologic information about the mines and surrounding areas; and evaluates and describes the environmental condition of the mines and downstream effects on various drainage tributaries. These activities also provide needed information for future studies of inactive and abandoned mines elsewhere in the United States. And in the State of Washington, USGS scientists, in cooperation with the University of Washington, are monitoring Mount Rainier to detect precursors to eruptive activity and are mapping volcanic mudflows to guide county officials in developing and implementing hazard-area

regulations of their local land-use plan and to assist local as well as State and federal agencies in emergency response operations.

In addition, agencies collaborate with non-governmental organizations to develop needed information about mountain ecosystems. For example, in August 2000, a symposium on Western Mountain Ecosystems was convened by the Ecological Society of America, in Snowbird, Utah, to explore the implications and causes of stressors in western mountain ecosystems. Presenters represented the USGS, NPS, and Montana and Colorado State Universities. Community partnerships in thirteen large-scale watershed restoration projects in the United States promote integrated watershed development by considering the economic, social, and environmental benefits during the development of business plans. Communities determine how to develop and sustain the health of the entire watersheds, regardless of ownerships, by considering the impacts of the work to be done, how it gets done, locations, and scales of activity. Information about the watersheds, resources, and capacities to manage from the mountains to the valleys is shared through education and widespread communication. The partnerships foster capacity building and many focus on economic diversification and alternative jobs.

Research and Technologies: Many entities focus on specific themes and/or geographic areas, involving others in the government and private sectors based on the issue. For instance, a Task Force on Forests in Sustainable Mountain Development within the International Union of Forest Research Organizations (IUFRO) produced a report on “Forests in Sustainable Mountain Development: A State of Knowledge Report for 2000.” The Mountain Research Center at Montana State University develops, synthesizes, and disseminates knowledge on the natural and socio-economic processes influencing mountain ecosystems. In addressing the impacts of humans it focuses on how global changes are manifest across scales. The U.S. Global Change Research Program (USGCRP), created in 1989, integrates research carried out by a number of federal agencies. Much research depends on the use of new technologies in remote sensing, Geographic Information Systems, and modeling techniques to analyze/generate computer-based views. More information is available at the USGCRP web site (<http://www.usgcrp.gov/>). Mountains also are used as field stations for studying air quality and climate variables. For instance, EPA uses high elevation sites in the West as monitors of trans-Pacific air toxics. FS has research programs that encompass the development and management of mountain ecosystems, from the Appalachians to the Cascades, and through its research stations (e.g., Rocky Mountain Research Station) maintains research work units that support federal land management through resource inventory, monitoring, and other analytical and technological needs related to fisheries, watersheds, climate change and air resources, recreation benefits, biological diversity, ecosystem health, ecological processes, and more.

In the United States mountainous places have traditionally depended on mining, forestry, and other activities. Over time many have become dependent on recreation and tourism as an alternative source of revenue. Since 1960 the federal government has been assessing outdoor recreation participation in the United States. The 2000 National Survey on Recreation and the Environment, coordinated by the FS and the National Oceanic and Atmospheric Administration, explored outdoor recreational needs and environmental interests of the American people through a survey of 50,000 households across all ethnic groups throughout the United States. Information about the survey is available from the FS Southern Research Station web site (<http://www.srs.fs.fed.us/trends/nsre2>). (See also the Sustainable Tourism chapter).

Financing: In the United States there is no national budget within the federal government for sustainable mountain development. Rather a variety of related activities are funded through a multitude of programs administered by agencies having various missions including the ARC and USDA. Since 1965 the 13-state ARC region alone has received \$6.5 billion in special federal funding which in turn has leveraged funds from state, municipal, and other sources; and the overall poverty rate has diminished closer to the national average, two-thirds of the adults now receive high school educations, and the infant death rate has been cut in half.

Cooperation: The United States is building cooperation among government and non-governmental interests to carry out sustainable approaches to development that integrate environmental, economic, and social concerns.

International and domestic agencies of the U.S. government sponsor programs that benefit mountain areas globally. Typically initiatives do not target mountain areas only, although many projects are in mountains. Many programs financed through USAID have benefited mountain areas. For instance, programs for Kyrgyzstan have assisted Osh residents with conversion of public housing to affordable condominiums, the International Organization for Migration and Counterpart Consortium and the Kyrgyz Republic Secretary of State is designing a Plan of Action to prevent human trafficking, and the Government of Kazakhstan is adopting internationally accepted principles for insurance for life and property. A project in the Ural Mountains of Russia was devised to reduce pollution by supporting new businesses to remove mercury from light bulbs, revegetate mine tailings, introduce filters to a power and heating plant, and manufacture and install sorbents for coke operations. USAID support in Costa Rica, Jamaica, Sri Lanka, Nepal, Thailand, and Guatemala have led to better protected wildlife parks and basic facilities for nature tourism. The Parks in Peril project has improved management of mountain parks in Latin America and the Caribbean. The Albania Private Forestry Development Program was designed by USAID to increase rural household incomes and reverse the decline of Albania's mountain forests through sustainable private-sector forest management practices on privately owned lands and on communal forests and pastures. USAID's GreenCOM project with the World Wildlife Fund and others accelerates local control and management of natural resources in Nepal.

Domestic agencies also have work underway that benefit mountain areas throughout the world. For instance, the U.S. Fish & Wildlife Service has programs on argali sheep conservation, and uses Geographic Information System Technology in Conservation as part of the United States-Peoples Republic of China Nature Conservation Protocol. EPA is the focal point in the United States for the Partnership for Pollution Prevention, a pledge by Western Hemisphere nations to collectively improve environmental protection regimes and mechanisms for implementing and enforcing environmental regulations, thereby building a foundation for sustainable development and free trade. It also is cooperating with the Pan American Health Organization (PAHO) to increase the capacity at a PAHO water reference laboratory in Lima, Peru, that aims to improve access to safe drinking water and sanitation in the Americas. The United States-China Forum on Environment and Development has several joint efforts including a feasibility study on use of market mechanisms to achieve sulfur dioxide emissions reduction in China and a market development plan for methane released from active coalmines.

In partnership with many international financial institutions, the United States supports sustainable development in mountain areas. One example is U.S. participation with 45 other Western Hemisphere nations in the Inter-American Development Bank. The Bank exists to help accelerate economic and social development in Latin America and the Caribbean through loans to strengthen the lending power of local financial institutions, and regional private investment funds with special focus on investment in small and medium size enterprises. One such project involved the expansion of dehydration facilities for an apple and pepper processing plant in Chile. Financial contributions to international organizations such as the Food and Agriculture Organization, the United Nations Environment Program, and the United Nations Development Program enable U.S. assistance to mountain regions through many cooperative activities.

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CHAPTER 14: PROMOTING SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

Decision-Making: The United States Department of Agriculture (USDA) is the leading U.S. agency charged with implementing U.S. policies for the provision of food, fiber, and forest products and resources. This includes responsibility for research, development, and dissemination of knowledge about ecosystems, sustainable methods of producing products, and the development of rural economies and communities. To accomplish this mission, USDA works with many others, such as state and local governments, the National Science and Technology Council, State land-grant colleges and universities, communities, and a wide array of private sector and non-governmental organizations. In 1987 USDA recognized that farmers must have choices in their management strategies, which include systems to minimize or reduce use of purchased inputs or otherwise improve their management efficiency while being environmentally sound and socially acceptable. In that year Congress also appropriated the first research and education funds directed specifically to sustainable agriculture goals. The USDA Natural Resource Conservation Service established agency policy regarding sustainable agriculture in 1989. The 1990 Farm Bill established the Sustainable Agriculture Research and Education Program.

The President's Council on Sustainable Development released its Sustainable Agriculture Task Force Report in 1996. The Report set forth goals and policy recommendations to achieve environmentally sound and economically viable agricultural production, revitalizing rural farming communities, production of safe, high-quality food, research to better integrate productivity, profitability, and environmental stewardship, and international harmonization of intellectual property rights. In 1996 USDA established sustainable development policy, stating that USDA “will balance goals of improved production and profitability, stewardship of the natural resource base and ecological system, and enhancement of the vitality of rural communities.” A Department-wide council serves as a mechanism to integrate across agency mission areas and activities. The USDA also established a National Commission on Small Farms to gather and analyze information about small U.S. farms and ranches. The Commission recommended a national strategy to ensure the continued viability of small farms, including specific measures the public, nonprofit and private sectors can take to enhance their economic livelihood. Periodic farm legislation has provided USDA with new authority and funding to advance its evolving sustainable development mission. New initiatives and programs have been established that address many objectives set forth in Agenda 21. These programs include technical, financial, and educational assistance to local rural and urban communities, farmers, ranchers, and forest landowners to achieve locally defined conservation and development goals within a framework of national objectives. Examples illustrating the breadth of these programs and activities follow.

Programmes and Projects: (for selected Program Areas)

Food Security and Sustainable Development – In 1999, the United States released a National Action Plan of Food Security titled “Solutions to Hunger.” The plan was developed in partnership with civil society and is the U.S. government's strategy for meeting the goal to halve the number of undernourished people by 2015. The plan addresses many factors affecting food security, including an enabling economic and policy environment, trade and investment, sustainable agricultural practices, strong safety nets, improved identification of the food insecure, safe food and water. The USDA Community Food Security Initiative was created to implement domestic components of the National Action Plan to help families move from poverty to self-sufficiency. Community food security is described as a prevention-oriented concept that supports the development and enhancement of sustainable, community-based strategies to improve access to low-income households to healthful nutritious food supplies, to increase the self-reliance of communities in providing for their own food needs, and to promote comprehensive responses to local food, farm, and nutrition issues. The 1998 report of the National Commission on Small Farms, *A Time to Act*, provides policy goals to strengthen the small farm sector and a vision of competitive advantage for small farms through supportive government and private initiatives, application of appropriate research and extension, and stimulation of new marketing opportunities.

People's Participation and Human Resource Development for Sustainable Agriculture: USDA principles for rural development include: recognize the diversity of rural America and the importance of the non-farm economy in rural

policy; create an environment that will attract private investment; emphasize the need for greater education and technical skills; capitalize on the natural resource base; expand infrastructure, community facilities and technology; and coordinate involvement of all stakeholders. The National Rural Development Partnership serves a network of national, state, local and tribal partners from the private and public sectors to develop policies, programs and initiatives to address rural issues including community and economic development, housing, health and human services, transportation, small business, veteran's affairs, environmental responsibility and equity. The USDA Office of Community Development promotes self-sustaining, long-term economic and community development in low-income rural communities based on public-private partnerships, long-term planning, and holistic development. The Appalachian Regional Commission (see Chapter 13) works as an advocate for and partner with the people of Appalachia to create opportunities for self-sustaining economic development and improved quality of life. There are nearly 3,000 conservation districts—almost one in every county of the United States, helping people conserve land, water, forests, wildlife and related natural resources by coordinating assistance from all available resources to develop locally driven conservation solutions. More than 15,000 citizen volunteers serve in elected or appointed positions on conservation district boards and work directly with more than 2.3 million cooperating land managers nationwide. Their efforts affect more than 315 million hectares of land. USDA supports 350 local Resource Conservation and Development Councils (RC&DCs) which represent about 80% of the counties in the United States to foster locally led natural resource-based rural development. RC&DCs work with more than 20,000 citizen volunteers to design, fund, and implement a wide range of demonstration and capacity building projects in their communities. Councils work with natural resource conservation and community/economic development agencies as well as land-grant colleges and universities to use technical natural resource, social, and economic information in local planning and decision-making processes. They also partner extensively to leverage opportunities and achieve even greater benefits through locally led conservation and community-based development.

Farm Production and Farming Systems: USDA principles for farm policy include: recognizing a new operating environment; continually expanding commitment to open markets; committing to the future growth of the farm and food system; ensuring that farm and trade policies are fully compatible; strengthening US global leadership; accommodating and building on the U.S. farm sector's wide diversity; providing a market-oriented economic safety net for farmers; and, focusing on a broader infrastructure. National organic certification standards were published in 2000 to assure consumers of consistent, nationwide product quality; and on streamlining interstate commerce in organically grown products. Forty state and private organic certification programs conducted third-party certification of organic production in 1997. Certified organic farming systems used 1.35 million acres of cropland and pasturelands in 49 states in 1997. *Land-Resource Planning, Information and Education for Agriculture:* The United States requires federal agencies evaluate the potential for farmland loss from their projects and programs. Through the 1996 Farm Bill, Federal funds were made available to stimulate and leverage state and local farmland preservation programs. USDA also conducts a periodic survey of land use trends, and has worked with non-governmental organizations to increase awareness and understanding of these trends at local levels, where most of these decisions are made.

Land Conservation and Rehabilitation: Farmers, ranchers, and private forest landowners own and manage two-thirds of the land and are the primary stewards of the nation's soil, air and water. While the cost of stewardship on that land is borne by land managers, the benefits serve society at large. Meeting society's demands for improved environmental quality requires that we broaden our definition of "output" to include environmental amenities - such as rural land amenities, wildlife habitat, wetlands, and improved water and air quality - along with food, fiber and timber production. Environmental concerns extend beyond the farm gate and have become key considerations in policy formulation.

Conservation programs can help reduce the gap between the level of environmental quality the public demands and the level of environmental quality that farmers and forest landowners would otherwise provide. Because environmental amenities typically are not sold on a market, managers of farm and forestland have limited marketplace incentives for providing them. Conservation programs can provide that incentive and compensate land managers for the amenities they produce. USDA provides technical, financial and educational assistance to stimulate the adoption of natural resource conservation management systems on the private working lands. Erosion

control, wetlands, wildlife habitat, and water and soil quality are some of the national and local natural resource concerns addressed. In addition to direct assistance programs, USDA farm program “conservation compliance” eligibility policy protects existing wetlands on agricultural land and requires that excess erosion on highly erodible agricultural land be controlled through implementation of a conservation plan. USDA also provides various natural disaster relief programs to assist farms and ranches that have suffered losses.

Water for Sustainable Food Production and Rural Development: Through Water and Environmental Programs (WEP) USDA provides loans, grants and loan guarantees for drinking water, sanitary sewer, solid waste and storm drainage facilities in rural areas as well as cities and towns of 10,000 or less. Public bodies, non-profit organizations, and recognized Indian tribes may qualify for assistance. WEP also makes grants to nonprofit organizations to provide technical assistance and training to assist rural communities with their water, wastewater, and solid waste problems. The United States also provides communities with watershed and river basin water conservation and flood management planning and conservation implementation technical and financial assistance.

Conservation and Sustainable Utilization of Plant and Animal Genetic Resources: The National Plant Germplasm System consists of 25 sites that maintain genetic resources and is the world’s largest repository of genetic resources. Information is stored in a common database known as the Germplasm Resources Information Network (GRIN) that is readily accessible. *Rural Energy Transition:* By Executive Order in 1999 federal efforts have accelerated to develop 21st century bio-based industries that use trees, crops, and agricultural and forestry wastes to make fuels, chemicals, and electricity. A goal of tripling U.S. use of bio-based products and bioenergy by 2010 has been established which could create \$15 billion to \$20 billion in new income for farmers and rural America and reduce fossil fuel emissions by an amount up to 100 million metric tons of carbon. The 2001 National Energy Policy recommends additional research into alternative and renewable energy resources, expansion of alternative fuel tax incentives, and a new renewable energy partnership program to facilitate the purchase of renewable energy. (See also **Chapter 4**).

Status: Agriculture and rural development in the United States today is both diverse and complex. USDA, including agencies that focus on farms, natural resources, communities, research and extension, and human nutrition, are increasingly working together to comprehensively understand the economic, social, and environmental health of the agriculture, forests, and communities. USDA programs have contributed to the restoration of over 89 million hectares of grass or trees cover on vulnerable cropland; the restoration of 1.7 million hectares of wildlife habitat, restoration of over 500,000 hectares of wetlands and buffers; and preservation of over 40,000 hectares of farmland in 28 states. State and local efforts, often working in partnership with federal agencies and non-governmental organizations, have protected over 400,000 hectares of farm or ranch land, and significant additional hectares of wetlands and wildlife habitat. The 1996 Farm Bill also continued existing natural resource conservation efforts which require preservation of existing wetlands on agricultural land, and require the application of conservation plans to control erosion on highly-erodible land for landowners to continue receiving farm program benefits.

Although significant progress has been made many challenges persist. Results from the USDA National Resources Inventory indicate that on the nation's non-federal cropland, erosion decreased by 38 percent between 1982 and 1997. However, excess erosion continues on close to 30% of U.S. cropland, contributing to a loss of 1.9 billion tons of topsoil each year. Although the cropland base is fairly stable at just under 1 billion hectares, and agricultural land preservation programs are growing, more than one-half million hectares of cultivated cropland or forestland are being converted each year to urban uses. About 30% of the land developed for urban uses since 1982 has been prime farmland. In 1999 the United States reported that Integrated Pest Management (IPM) was adopted on 75% of U.S. cropland for pest scouting in fruit and vegetable crops (Green Technologies for a More Sustainable Agriculture, USDA/Economic Research Service (ERS)). Full implementation is expected in vegetable production between 2008-36, and in fruit acres by 2005. Scouting for weeds and pests has already been adopted on most field crop acreage.

The 1999 and 2000 editions of Rural Conditions and Trends released by the ERS report that while rural unemployment is falling and incomes and earnings are increasing, rural areas continue to lag urban areas in earnings and income. Trends toward increased concentration of production and marketing of agricultural commodities continue to reduce the farm and ranch share of food system profit. The number of farmers markets in the United States increased 63 percent from 1994 to 2000. The 2000 National Farmers Market Directory lists over 2,800 farmers markets. Organic farming also became one of the fastest growing segments of U.S. agriculture during the 1990s. Certified organic cropland more than doubled from 1992 to 1997, and two organic livestock sectors—eggs and dairy—grew even faster. While adoption of organic farming systems showed strong gains between 1992 and 1997 and the adoption rate continues high, the overall adoption level is still small—only about 0.2 percent of all U.S. cropland was certified organic in 1997. Obstacles to adoption by farmers include large managerial costs and risks of shifting to a new way of farming, limited awareness of organic farming systems, lack of marketing and infrastructure, inability to capture marketing economies, insufficient numbers of processors and distributors, and limited access to capital. (See U.S. Organic Farming Emerges in the 1990s: Adoption of Certified Systems (AIB-770 June 2001).

Capacity-Building, Education, Training and Awareness-Raising: The Appropriate Technology Transfer for Rural Areas program provides information to farmers and other rural users on a variety of sustainable agricultural practices that include both cropping and livestock operations. The program encourages agricultural producers to adopt sustainable agricultural practices that allow them to maintain or improve profits, produce high quality food and reduce adverse impacts to the environment. More than 40 percent of the questions received concern agricultural chemicals and 25 percent are about raising animals, including animal feeds, health, and pasture management. Sustainable production techniques, crop diversification, and marketing are the other major areas of interest. The USDA Rural Development programs provide technical and financial assistance to, individuals, corporations, partnerships, cooperatives, public bodies, nonprofit corporations, Indian tribes, and private companies. Programs help establish partnerships to build competitive businesses including sustainable cooperatives that can prosper in the global marketplace. They leverage resources to create or preserve jobs, meet business and credit needs, particularly in under-served areas, and promote a clean rural environment.

The USDA National Agroforestry Center provides agroforestry training for natural resource professionals who work with landowners to increase the integration of agroforestry practices (e.g., windbreaks and riparian forest buffers) into existing agricultural operations. Practices are promoted to reduce soil erosion, protect crops, provide wildlife habitat, and improve water quality at the watershed and landscape scales. Agroforestry systems such as alley cropping, silvopasture (timber/grazing) systems, and forest farming of specialty products are also promoted to improve and diversify farm production and farming systems. Through Sustainable Agriculture Research and Education (SARE) program grants, USDA funds projects aimed at making agriculture more profitable, environmentally sound, and good for communities. Through the program USDA publishes practical publications geared at farmers, ranchers and agricultural educators. Recent publications include information about how to use cover crops, how to improve soil quality and alternative ways to manage weeds. One resource offers close to 50 in-depth features about farmers and ranchers, from a banana grower in Hawaii to a potato farmer in Maine. SARE also awards Professional Development grants aimed at providing educational opportunities and resources to field professionals of USDA agencies.

USDA's Regional Rural Development Centers, established by the 1972 Rural Development Act, serve the nation through their unique role in linking the research and extension capacity of land-grant universities with farm, ranch, and forest communities and rural decision-makers. Changes in agriculture and more broadly in rural America present complex new challenges and opportunities. The Centers foster a holistic approach to development by encouraging simultaneous attention to human capital, community capacity, physical infrastructure, financial resources, and environmental stewardship. They support scientific, applied research on diverse issues, deliver programs to increase the capacity for holistic development, and provide leadership for harnessing telecommunications and new technologies that open new opportunities. The Centers provide comprehensive training to Extension specialists, rural development professionals, community leaders, local governments,

businesses, and entrepreneurs. EPA has released compliance assistance materials on the crop, livestock, and agrichemical industries. They explain in lay terminology major environmental issues facing agriculture including: general industry information (economic and geographic), description of industrial processes, pollution outputs, pollution prevention opportunities, federal statutory and regulatory framework, compliance history, description of partnerships, bibliography and resources for further research.

Information: The Sustainable Agriculture Network is the national outreach arm of the USDA Sustainable Agriculture Research and Education program. The Sustainable Agriculture Network disseminates information about sustainable agriculture through electronic and print publication. The National Agricultural Library (NAL), part of the USDA's Agricultural Research Service (ARS), provides world leadership in developing and applying information technologies that ensure that agricultural knowledge and information are available to those who need it. AGRICOLA (AGRICultural On Line Access), NAL's ever growing bibliographic database of over three million records, provides onsite and remote users with information. The NAL also has an information center that specifically focuses on alternative farming systems. Extension agents in virtually every county provide information and technical assistance to farmers and other citizens. Other clearinghouses serving rural and urban America are maintained by other agencies for specialized purposes (e.g., the National Agroforestry Center and the National Soil Survey and the Plants Database maintained by the Natural Resources Conservation Service).

Many government programs collect data, establish databases, and provide network access to these databases. Agricultural production and natural resource databases are developed and maintained for germplasm information, pests, pesticide and fertilizer use, production practices, soil types, forest types, insect infestations, and crop coverage/production. Economists analyze the data to compare input use and profitability of different production practices. Community and rural development databases provide data on economic and demographic trends, tools to assist planning and community decision-making, resources for enterprise development and entrepreneurial activity, land use policies, and science-based solutions and technologies. For example, USGS is investigating and providing information on the fate and occurrence of agricultural chemicals in the United States, characterizing the processes that affect dispersal of chemicals in the atmosphere, ground water, and surface water; identifying persistent degradation products; and developing methods to measure these compounds in water samples at environmentally relevant concentrations. Government regulators, pesticide manufacturers, farmers, water resource managers, and the public use results of these investigations. Many databases are accessible worldwide by research scientists, extension agents, farmers, and the general public.

Research and Technologies: Under the 1996 Farm Bill and the 1998 Agricultural Research, Extension and Education Reform Act, USDA continues its support of the national university-based agricultural knowledge system to develop science-based solutions to help farmers and ranchers and rural communities remain productive and profitable. It has also taken steps to ensure sustainable agricultural systems are developed. The Cooperative State Research, Education, and Extension System CSREES, along with the Agricultural Research Service (ARS), the Economic Research Service (ERS), and the National Agricultural Statistics Service, assess stakeholder priorities and invest time and effort to make the agricultural knowledge system responsive to public needs. These programs combine to deliver the results of research all the way to the dinner table. Competitive grant programs through CSREES support basic research and integrated research and extension projects to address critical issues in agricultural production, food systems, and economic and community systems and to develop new technology. Since 1988, the CREES Sustainable Agriculture Research and Extension (SARE) program has provided funding for approximately 2000 projects in the areas of research and education producer grants and professional development. And the National Agroforestry Center, sometimes in cooperation with SARE and EPA, has conducted research on alternatives including the design and installation of riparian forest buffers to protect water quality.

Government research and education on Integrated Pest Management (IPM) focuses on pests, pesticide resistance, biological controls, cultural controls and sterile insect release programs. The ARS conducts research on sustainable plant nutrition and increasing food production, availability, and safety. All aspects of agricultural research from germplasm conservation to human nutrition are addressed in 23 national programs. The Integrated Farming

Systems (IFS) National Program is the focal point for research activities that take a holistic approach. In addition, every ARS project is rated on its contribution towards sustainable agriculture using seven criteria, resulting in an increasing number of projects that directly contribute. USDA, EPA, and the Department of Energy (DOE) have supported numerous research, demonstration, and pilot projects on producing alternative energy from agriculture and forests, including, for example, methane capture from livestock operations, production and use of biomass crops, and solar and wind power generation.

Financing: The federal budget appropriates funds to various agencies to carry out their authorized programs. Agencies use a variety of methods to ensure effective fund utilization. Cost share payments for conservation practices, land rental payments or conservation easement purchases to preserve farmland, or restore grasslands, woodlands, or wetlands, often leveraged with matching state and local funds, are a few of the instruments used in the natural resource and land conservation programs. Local farmland protection programs also make use of a variety of other financing options, often cooperating with non-governmental organizations to, for example, purchase development rights on farmland, or establish land trusts. To help rural Americans build globally competitive businesses and cooperatives, the USDA administers a variety of business programs including grants, commercial lending and revolving loan funds as well as technical assistance, which are usually leveraged with commercial, cooperative, or other private-sector lender resources. Guarantees or direct loans are available for businesses that create or maintain employment and improve the economic and environmental climate in rural communities. USDA also finances the backbone rural utility infrastructure, covering electricity, telecommunications, and water delivery systems, necessary for rural economic development. The Regional Rural Development Centers, in partnership with other federal agencies, non-governmental organizations, and philanthropic organizations, has provided funding for applied, timely research. The research informs policy making, builds the knowledge base for new approaches to rural development, and encourages in integration of agricultural innovations with community and economic development and environmental stewardship.

Cooperation: The United States participates in the international exchange of scientific personnel for education, training, and cooperative efforts related to sustainable agricultural and forestry practices in developing countries. It also provides international scientific, technical and educational assistance addressing a wide array of issues. USAID has supported sustainable practices through the International Agriculture Research Centers (IARCs) that receive funding through the Consultative Group on International Agriculture Research. The United States also has worked at FAO to support greater diffusion and action on programs that promote sustainable agricultural and forestry practices. DOE is helping to promote rural development internationally through a public-private partnership entitled Village Power 2000. Village Power 2000 taps the resources of U.S. companies to bring clean and affordable energy to the hundreds of millions of rural people throughout the world who do not have access to electric power. Wind, solar, and biomass technologies have been used in projects in Mexico, The Dominican Republic, Chile, China, Russia, Bolivia, and Uganda.

The African Sustainable Tree Crops Project (STCP) project supported by the US Geological Survey is a capacity building venture designed to increase tree productivity and quality, enhance environmental quality, and improve socio-economic return for small landholders. Tools are provided to help producers improve degraded land, improve product quality, improve market efficiency, enhance and protect biodiversity, and conserve resources. USGS and other Federal and international agencies, responded immediately and aggressively in the aftermath of Hurricane Mitch by providing humanitarian relief and hazard mitigation in high-risk areas. That support has continued and expanded during the past two years, in the form of the USGS Hurricane Mitch Program, which supports reconstruction activities in 4 major categories: providing basic information in the form of topographic maps, aerial photography, and satellite imagery, as well as biological and hydrological assessments; monitoring and assessing risk from floods, landslides and debris flows; developing geographic information systems products for use by national and local officials in disaster mitigation and urban planning; and capacity strengthening of Central American national agencies and local governments to monitor and assess hazards and develop strategies for risk reduction and disaster response. In addition, the USGS has been instrumental in creating the Hurricane Mitch

Clearinghouse Activity, an integrated network of computer servers that houses vast amounts of digital spatial data relating to the Hurricane Mitch disaster. The network is formed of five Clearinghouse nodes; one node is found in each Mitch-affected Central American country (Honduras, Nicaragua, El Salvador, and Guatemala) while the fifth is located at the USGS.

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CHAPTER 15: CONSERVATION OF BIOLOGICAL DIVERSITY

Fifteen years ago, only six condors remained in the wild. In 2001, after substantial research, changes in management plans, and a successful reintroduction program, a condor chick once again was born in the wild. As Secretary of the Interior Gale Norton stated when an additional 5 condors were released into the wild:

“I have the great pleasure of helping to return five of these grand birds born and raised in captivity back into one of the world's most beautiful areas. Just as inspiring, for the first time in 15 years, on March 25th, a biologist spotted a condor egg laid in the wild. Hand-in-hand with many partners, we are pulling this majestic bird back from the brink of extinction... Saving the California condor is a model of what we can do -- and what we must do - to save our endangered wildlife. I believe there are good ideas all over America - just like this captive breeding program. I believe in the value of developing partnerships and listening to people. “

This achievement is the result, as Secretary Norton points out, of substantial work in public and private organizations to improve conservation of biological diversity in the United States and the world. The United States has been working in many areas: to build the proper conditions for conservation and sustainable use; to work to improve scientific understanding of biodiversity and ecological issues; to use this science for better and more informed decision making; to develop programs and projects more effectively manage and respond; and to expand the general public's, the media's, and the government's understanding of the issues. Research, programs, policy and strong public-private partnerships are providing examples for future management choices.

Decision-Making: Biological diversity, commonly shortened to “biodiversity,” has been widely accepted as an ecological principle applicable to managed landscapes. Biodiversity is based on the concept that a monoculture of one or a few species is much more susceptible to sudden and catastrophic decline from disease or parasitism than a diverse assemblage of plants and animals. In numerous federal, state, and local governments; non-governmental entities; and scientific organizations the promotion of diversity has been instituted as good public policy. A vast array of government agencies, conservation and environmental groups, universities and research organizations, legal institutions, and others support biodiversity conservation in the United States and throughout the world. There are hundreds of state and federal laws and programs and an extensive system of federal and state wildlife refuges, marine sanctuaries, wildlife management areas, recreation areas, parks, and forests that promote biodiversity. The federal government has broad responsibility for managing the terrestrial, freshwater and marine biodiversity of public lands (approximately one-third of the U.S. land area), and coastal waters. State governments have broad responsibilities for regulating uses of land and natural resources (e.g., hunting and fishing) not subject to federal regulation. State and local parks and reserves are important in biodiversity conservation. In addition, non-governmental organizations (NGOs), private institutions and landowners protect large numbers of tracts, maintain significant ex-situ facilities such as arboreta and zoological parks and play an increasing role in conservation.

Maintenance of biodiversity benefits restoration of essential ecological functions of plant and animal communities, promotes management of landscapes for sustainable use, and protects relatively wild and unmarked plant and animal communities. Management of rare and declining species and invasive species has received considerable attention in public policy. At the federal level the Endangered Species Act and the National Invasive Species Council address these issues. Numerous state and local laws support the federal effort and coordinate with Federal Clean Air and Water Acts and other laws to promote sustainable use of natural resources in the economy. Coordination among Federal agencies, especially Interior and Agriculture, supplements state and local agricultural policy to promote biodiversity and sustainable use of natural resources.

Programmes and Projects: Although it is not possible to provide an exhaustive list of programs and projects in

support of conservation and sustainable use of biodiversity in the United States, many federal land management agencies manage federal lands to meet biodiversity objectives among others; many also have cooperative responsibilities to work with States, private landowners, and others to develop plans and implement practices on the land they manage that protect wildlife, recreation, water, wetlands, and soil. The National Wilderness Preservation System includes over 100 million acres administered by the U.S. Forest Service, National Park Service, Fish and Wildlife Service and Bureau of Land Management. The U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service administer the Endangered Species Act. Under the National Wildlife Refuge System the U.S. Fish and Wildlife Service administer critical habitats and ecosystems. The Farmland Protection Program and the Forest Legacy Program, administered by U.S. Department of Agriculture (USDA)'s Natural Resources Conservation Service (NRCS) and Forest Service (FS), respectively, focus on maintaining a working landscape that includes farms and forestlands for environmental, economic, and social reasons.

A February, 1999 Executive Order established the National Invasive Species Council, made up of 10 Federal Agencies, to direct and coordinate the work of the U.S. government agencies on this issue. The Council has recently finalized the first National Invasive Species Management Plan. Among many Federal efforts are the USGS Invasive Species Program, which focuses on developing information, methodologies, and tools for understanding and predicting pathways of introduction, identifying and assessing new invasions, determining impacts of invasions and habitat susceptibility, and developing approaches to control or eliminate populations of invasive species. The Plant Conservation Alliance, a consortium of ten federal Agencies and over 145 non-federal cooperators representing various disciplines in the conservation field, awards matching grant funding for on-the-ground conservation and restoration projects through the National Fish and Wildlife Foundation.

Biodiversity conservation efforts are underway in states throughout the United States. For example, Maryland's Green Infrastructure Assessment and Network is designed to protect and link remaining ecologically valuable lands, including large contiguous tracts of forestlands, wildlife habitats, wetlands, riparian corridors, and areas that reflect key elements of the State's biological diversity. At the national level the work of the States, and other localities is being highlighted through a Green Infrastructure Working Group of government agencies and non-governmental organizations that seek to illustrate that identifying and planning for an interconnected network of the nation's natural life support system of land and water is smart conservation and smart growth.

The USDA has a variety of programs to provide technical and financial assistance to private landowners and managers to promote the enhancement of wildlife habitat and the protection of biodiversity on the private lands of the United States, which account for at least 75 percent of the landmass. These assistance programs are often implemented in partnership with local, state and other federal agencies as well as with NGOs. We have witnessed a strong growth in the development of initiatives, such as land and conservation conservancies and trusts that expand the privately held land being used for conservation and sustainable use of biological diversity. Our government and private organizations are conducting research around the country and the world to better understand the fundamental principles of biodiversity and ecology. They are working to increase the availability of the findings and data for better decision making at the local, regional and global level. For example, the Smithsonian conducts research on biodiversity globally and develops information and knowledge bases fundamental for effective policymaking and implementation. In the case of the Smithsonian Marine Station in Fort Pierce Florida has developed the Indian River Lagoon Species Inventory, an area of high biological diversity, and high human impact. This data will feed into coordinated management plans along the fragile coast. The Smithsonian also maintains the national clearinghouse for ballast water releases impacting marine and riparian alien species releases.

Status: Post-UNCED domestic policy has focused on promoting partnerships among Federal, state and private programs concerned with biological diversity, coordinating government-wide research, information management systems, technology development, technical and financial assistance for private working land, demonstrations of ecosystem-based management approaches, strengthening protected areas, maintaining ex-situ repositories for genetic resources, controlling invasive species, and improving public education. The US government funds training and research on all of the major issues covered by biodiversity concerns, including the path-breaking NSF

Partnerships for Enhancing Expertise in Taxonomy (PEET) program. Federal systems of national parks, forests, grasslands and arid lands, wildlife refuges, marine sanctuaries, wilderness areas, and other management categories and special designations play a major role in in-situ conservation of biodiversity. Since 1992, six new marine sanctuaries have been created, protecting precious indigenous species. The USGS Gap Analysis Program (GAP) identifies the degree to which native animal and plant species are present within conservation lands. The GAP program provides broad geographic information on the status of species and their habitats. Federal programs and facilities (National Plant Germplasm System within USDA) play a major role in collection and ex-situ preservation of crop germplasm and other genetic resources of potential or actual economic importance.

Forest fragmentation, especially in urbanizing areas, is one of the biggest concerns facing sustainable forest management in the United States. This includes fragmentation within a contiguous forest block, but also how forestlands are being lost or converted to other uses. A national conference in Annapolis, Maryland, in 2000, helped to highlight the issues and raise awareness about its magnitude. In addition, efforts to prevent the introduction and control of the spread of invasive species in the U.S. continue to face a number of challenges domestically and internationally. Smithsonian Center for Tropical Forest Science work on forest fragmentation and dynamics in the tropics have greatly expanded our understanding of these key ecosystems during the past decade. Cooperative efforts involving various levels of government and the private sector are underway to implement the biosphere reserve concept in several regions. For example, in the diverse forest ecosystem of the southeastern highlands, the Southern Appalachian Man and the Biosphere (SAMAB) Program is being implemented as a joint undertaking of the SAMAB Cooperative and the SAMAB Foundation. The former organization includes representatives from Federal and state agencies, and the latter from private institutions, NGOs, and local communities. The non-governmental Nature Conservancy (TNC) has pioneered development of methods and data systems to support biodiversity conservation. Expansion of assistance to private landholders and managers to improve the wildlife values of their land has been a key factor in significant improvement in the range and quality of wildlife habitat in the US.

Capacity-Building, Education, Training and Awareness-Raising: There are numerous programs in support of capacity education, training and awareness in the areas of conservation and sustainable use of biodiversity, wildlife management, biosafety, marine, coastal and terrestrial land management and other areas. As one example, the Smithsonian Institution Monitoring and Assessment of Biodiversity Program (SIMAB) is an international leadership program to provide support and training to biodiversity monitoring and assessment projects in developing countries. Other Smithsonian programs train taxonomists, ecologists and policy makers on key issues. Domestically, agencies provide incentives for private forest and agricultural landowners and for landscape-level planning involving farmers, ranchers, and forest landowners. Extension programs on agriculture, sustainable forestry, chemical-use reductions, and watershed management have greatly enhanced capacity nationally and internationally.

A non-governmental example is forest management certification initiatives that have developed over the past ten years. Forest certification systems are voluntary, market-based conservation tools that recognize and promote responsible forest management on private and public forestlands: these systems have been instrumental in raising awareness about improving forest conditions, including biodiversity, through sustainable resource management. The Forest Stewardship Council as well as Sustainable Forestry Initiative, administered by the American Forest and Paper Association, promotes sustainable forest management through the implementation and monitoring of certification and verification standards that incorporate economic, environmental, and social components. The Tree Farm Program's American Tree Farm System and the National Forestry Association's "Green Tag Forestry" programs work with small, private landowners to implement sustainable forest practices. The Forest Stewards Guild promotes certification by providing educational resources and continuing education for forest resource managers, assisting in the development of certification standards, offering financial assistance to landowners seeking certification, and promoting and networking for certification systems. The United States has expanded its informal education on biodiversity greatly. All of the major natural history museums in the country have developed

major exhibitions and education programs to bring the range of concerns to the general public. Our media and the Internet have expanded information access and issue understanding throughout the country and the world.

Information: The Biological Resources Division (BRD) of the US Geological Survey administers the National Biological Information Infrastructure (NBII), a meta-database, information clearinghouse and national information server linking biodiversity information throughout the federal government. In 1995 NBS issued a baseline study, “Our Living Resources: A Report to the Nation on the Distribution, Abundance, and Health of U.S. Plants, Animals, and Ecosystems.” In 1999, *Status and Trends of the Nation’s Biological Resources* looked at critical biodiversity issues in different ecological regions of the country and provides the first large-scale assessment of the nation’s plants, animals and ecosystems. There are many sources for information such as National Biodiversity Databases on Ecosystems that include: National Wetlands Inventory, National Coastal Wetlands Database, Wetlands Creation and Restoration Database, Gap Analysis Database, Global Ecosystems, Biospherics Program, Earth Resources Observation Systems, Data Atlases (Coastal/Marine Ecosystems) and the National Estuarine Inventory. Starting in 2001, information on the national biological collections housed at the Smithsonian (the world’s largest collections) is being placed online, available through the World Wide Web. This data will link with data from museums and collections around the world and enable global, regional and local initiatives, such as the Global Biodiversity Information Facility and the Inter-American Biodiversity Information Network, to develop more effective forecasting and management tools. Such tools are being prototyped by the Species Analyst program developed at the University of Kansas and the San Diego Supercomputer Center, and supported by the North American Biodiversity Information Network, US agencies and the National Science Foundation.

The Association for Biodiversity Information (ABI) exists to develop, manage, and distribute authoritative information critical to the conservation of the world’s biological diversity. ABI is a new non-profit formed in July 1999 when The Nature Conservancy and the Natural Heritage Network of data collection centers jointly established an independent organization of existing databases, staff, and methods to achieve mutual goals. Its key activities include developing information products to guide conservation decision-making, comprehensive databases for at-risk species and ecological communities, standards for biological inventory and data management, and more. The information is used by a variety of interests for multiple purposes (e.g., conservation groups and government agencies to establish priorities, developers and businesses to comply with environmental laws, and private landowners to make management decisions). The United States has provided key information and data on geographic information systems to enable managers around the world be more effectively monitor and assess conditions and develop methods to model and forecast changes.

Research and Technologies: Within the Federal Government, the USGS, National Park Service, Agricultural Research Service, the Fish and Wildlife Service, the Smithsonian and NOAA’s National Marine Fisheries Service all have applied programs of field research and are involved in research and development of new techniques for conservation. Academic research is carried out in private and land grant universities, botanical and zoological parks, and by environmental NGOs. USGS expertise in conservation genetics provides an indispensable suite of tools and fundamental information about biological resources that assists managers and administrators in making critical natural resource decisions addressing the status, health, and future of the nation’s wild animal and plant populations. The USDA Forest Service has research and development programs that assess biodiversity and provide the science for conserving and managing biodiversity.

Financing: The principal agencies that support major R&D programs in environment and natural resources include the Department of Agriculture, The Department of Commerce’s National Oceanic and Atmospheric Administration (NOAA), the Department of Defense (DOD), the Department of Interior, the Department of Transportation, EPA and the National Science Foundation. A review of the major funding opportunities for environmental R&D is compiled by the Committee on Environment and Natural Resources Research of the National Science and Technology Council, which provides an annual overview of all-federal funding for environmental research. US

AID provides substantial funding for environmental, agricultural and educational programs around the world. In 1998 the Senate gave the President authority to conduct debt-for-nature swaps involving NGOs working on forest conservation. The Tropical Forest Conservation Act (TFCA) is a unique and valuable mechanism that funds activities to protect tropical forests in developing countries through debt relief agreements (see also Chapter 11, Financing). Congress has also recognized the need to protect migratory bird habitat outside of the US, through the passage of the Neotropical Migratory Bird Conservation Act in 2000. The Act establishes a matching grants program to fund projects that promote the conservation of neotropical migratory birds in the United States, Latin America, and the Caribbean.

Cooperation: In response to global concerns about the Earth's biodiversity, a variety of government and non-government efforts are underway. Through the International Cooperative Biodiversity Groups Program, the National Institutes of Health and the National Science Foundation collaborate to award grants to U.S. and developing country partners for discovering bioactive agents for the pharmaceutical industry while encouraging sharing of the benefits arising out of the use of genetic resources. The United States expanded participation in international programs to support the conservation of native migratory species that require seasonal habitats in multiple countries through the Partners in Flight Program and the North American Bird Conservation Initiative. In 1994, the United States, Canada, and Mexico signed an update to the North American Waterfowl Management Plan that expanded their commitment to restoring continental waterfowl populations and conserving the biological diversity of critical wetlands. The Department of State, as part of the National Invasive Species Council, is working regionally and internationally to raise awareness of this critical issue, including through sponsoring a series of workshops in collaboration with the Global Invasive Species Program.

The State Department led the U.S. Agencies in coordinated global development of the International Coral Reef Initiative launched in 1995 to build domestic and international partnerships, coordinate and integrate existing and new activities, and develop the technical and human resources needed to conserve, protect, and manage coral reef ecosystems in the United States and the world. The Biodiversity Conservation Network funded by USAID, works with NGO and private sector partners in host countries to develop and implement economically viable approaches for conserving biodiversity at the local level. In cooperation with the World Bank, USAID in 1994-1995 helped establish funding mechanisms to strengthen country institutions and support biodiversity activities in Indonesia (Indonesia Biodiversity Foundation) and Mexico (Mexican Conservation Fund), and recently provided a \$3 million grant to Conservation International to conduct rapid biodiversity assessments in the Andean region of South America and insular Southeast Asia and the Pacific. Another long-term USAID initiative is the Central African Regional Program for the Environment (CARPE) created to address the issues of deforestation and biodiversity loss in the Congo Basin forest zone. The USDA Forest Service is one of many partners representing CARPE and is providing technical assistance to address sustainable forest management, the bush meat crisis, and non-timber forest products.

In 1993, the Commission for Environmental Cooperation (CEC) was created to address regional environmental concerns in North America. The CEC helps prevent potential trade and environmental conflicts, and promotes the effective enforcement of environmental law, all as part of its mandate under the North American Agreement on Environmental Cooperation, the side agreement to the North American Free Trade Agreement (NAFTA). The CEC Conservation of Biodiversity Program has facilitated cooperation between Mexican, Canadian, and U.S. governments, NGOs, institutions, and local communities through several projects. Examples include projects on shared and migratory marine and terrestrial species, development of a North American Biodiversity Information Network, and cooperation on mapping marine and estuarine ecosystems. Since 1996, CEC has given 142 grants totaling US\$5.4 million to community-based initiatives contributing to the conservation, protection and enhancement of the North American environment.

In 1995, as an endorser of the Santiago Declaration, the U.S. agreed to use the Montreal Process Criteria and Indicators for the Conservation and Management of Temperate and Boreal Forests (C&I) as a common framework to work with government and non-governmental interests in the U.S. and in the participating countries. The first criterion focuses on the conservation of biological diversity and includes nine indicators dealing with ecosystem

diversity, species diversity, and genetic diversity. In the United States a national multi-stakeholder forum known as the Roundtable on Sustainable Forests exists to share information and perspectives about sustainable forest management in the U.S. using the C&I as a common language and framework. In 2003 each of the Montreal Process countries will be reporting on the state of their nation's forests using the C&I framework.

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CHAPTERS 16 AND 34: ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY AND TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY, COOPERATION AND CAPACITY-BUILDING

ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY

Decision-Making: The United States takes a vertical or sectoral approach to the regulation of biotechnology products. Under this approach, articulated in the 1986 document “Coordinated Framework for Regulation of Biotechnology,” products of biotechnology are regulated using existing product-specific statutes. The Environmental Protection Agency (EPA) (e.g., the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act), the Department of Agriculture (USDA) (e.g., the Plant Protection Act, the Virus, Serum, Toxin Act), and the Food and Drug Administration (FDA) (e.g., the Federal Food, Drug, and Cosmetic Act) administer the statutes primarily used to regulate biotechnology products. The U.S. regulatory agencies coordinate their activities, with each other and with U.S. agencies with interests in biotechnology issues (e.g., Department of State), through both informal and formal mechanisms. Formally, the agencies coordinate through a high level group, the Agriculture Biotechnology Coordination Working Group.

Programmes and Projects: The United States ensures the environmentally-sound management of biotechnology products. The emphasis within the U.S. government has been scientifically based regulation, which incorporates consideration of the degree of uncertainty of evidence and conclusions in the context of individual decisions. All regulated products, both traditional and those produced through biotechnology, are therefore subject to review and assessment by the Agency with the appropriate expertise, as described above. This range of products includes, but is not limited to: human and animal pharmaceuticals and biologics, pesticides, commodity and specialty chemicals, foods and food additives (e.g., rennin for cheese-making) and products of agricultural biotechnology (e.g., crop plants and food from such plants).

Status: The United States has implemented regulations where necessary under existing statutes, and thus currently has in place a regulatory system to ensure the sound use of products derived through biotechnology. The United States continues to evaluate its regulatory system with respect to new products of biotechnology. Panels of scientific experts are regularly convened to advise the respective regulatory agencies, and new scientific information is consistently incorporated into the decision-making processes.

Capacity-Building, Education, Training and Awareness-Raising: The U.S. agencies responsible for the sound use of biotechnology products regularly holds public meetings in order to facilitate the exchange of information and opinions. In addition, a large amount of data is made available to the public through various media (described below). Internationally, USAID provides funding for the Agricultural Biotechnology Support Program, which assists developing countries in the development and management of the tools and products of agricultural biotechnology. HIV/AIDS projects in biotechnology extend from encouraging research to biosafety regulation training and raising public awareness. In 1999, the USDA established the African Biotechnology Initiative to help the development and use of biotechnology in Sub-Saharan Africa. Several Offices within the USDA (e.g., the Foreign Agricultural Service, Agricultural Research Service, Animal and Plant Health Inspection Service) also serve as information resources throughout the world.

Information: The U.S. agencies responsible for ensuring the environmentally sound use of biotechnology products have established sites on the Internet where large amounts of background information on any decisions reached are made readily accessible to the public. For example, the EPA information base can be accessed at: <http://www.epa.gov/pesticides/biopesticides/>, the USDA information base can be accessed at: <http://www.aphis.usda.gov/biotech/>, and the FDA information base can be accessed at:

<http://www.cfsan.fda.gov/~lrd/biotechm.html>. The U.S. agencies have established links between their various Internet sites. In addition, information on regulatory decisions, including a large amount of background information, is publicly available through a docket system, as well as through publication in a daily journal, The Federal Register. Internationally, the United States will participate in the Biosafety Clearinghouse established under the Biosafety Protocol of the Convention on Biological Diversity, and is contributing resources towards its formation.

Research and Technologies: A number of U.S. Federal agencies fund research on biotechnology-related projects. For example, the Department of Energy (DOE) is conducting research on microbial ecology and the genomics of environmental organisms to increase the understanding of carbon sequestration and the microbial degradation of hazardous contaminants to help address air, surface and water pollution. USDA has led in efforts to determine the genomic DNA sequences of major crop plants. It is expected that the knowledge gained through these efforts will lead to improved plant varieties and more suitable insect and disease resistance in both conventional and engineered plant varieties. In addition, EPA is conducting research on microbial and phyto-remediation to address hazardous contaminations of pesticides, insecticides and herbicides, and both USDA and EPA are creating and managing initiatives to address developing environmental questions pertaining to products derived through biotechnology.

Financing: The United States government agencies are financed through the federal budget, which is determined annually by the U.S. Congress in conjunction with the Executive Branch. Each agency is responsible for its own budgeting, but designates resources specifically for biotechnology, detailing portions for regulatory processes and initiatives, as well as for research.

Cooperation: The United States participates actively in international cooperation and agreements on the bilateral, regional and international level to ensure human health and environmental protection. For example, the United States has bilateral discussions with the European Union on biotechnology issues (e.g., within the U.S.-E.U. Transatlantic Economic Partnership). The United States also actively cooperates regionally with Canada and Mexico (e.g., with the North American Free Trade Agreement committees on standards-related measures and environmental cooperation, and on the Sanitary-Phytosanitary Agreement). The United States also works within the Organization for Economic Cooperation and Development to harmonize approaches to regulation of biotechnology products, and with international organizations such as the United Nations Environment Program and the United Nations Food and Agriculture Organization (e.g., International Plant Protection Convention, the Convention on Biodiversity). Through Codex Alimentarius, a joint Food and Agriculture Organization/World Health Organization food standards program, the United States is participating in international efforts to ensure appropriate safety assessment of foods and food ingredients derived from biotechnology.

*TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY,
COOPERATION AND CAPACITY-BUILDING*

Decision-Making: No single U.S. federal agency is responsible for the transfer of environmental technologies, technology cooperation, or capacity building. The Environmental Trade Working Group (ETWG), a multi-agency body charged with enhancing the export of U.S. environmental goods and services, coordinates federal-level efforts to promote environmental technologies. However, the ETWG's focus is limited to trade promotion/assistance activities and does not encompass all of the U.S. government's efforts related to environmental technologies, technology transfer, or capacity building.

Programmes and Projects: In 1993, EPA launched the U.S. Technology for International Environmental Solutions (U.S. TIES) initiative. This three-year, US\$22 million program brought together the U.S. public and private sectors to address environmental objectives overseas. U.S. TIES projects included the demonstration of sulfur and nitrous oxide control technologies, assistance in the development of renewable power resources, training

in pollution prevention for key industries, and numerous others. Projects were viewed as having multiple benefits: industrializing countries could profit from access to U.S. experience in environmental technologies and services; U.S. technology developers could benefit from international exposure of their goods and services; the U.S. public could benefit from reduced pollution from sources beyond our borders. In 1995, EPA initiated its Environmental Technology Verification (ETV) Program to assess the environmental performance characteristics of commercial-ready technologies through the evaluation of objective, quality-assured data. With such data, purchasers and permittees are better able to select cost-effective environmental technologies. International interest in verification has grown rapidly over the past six years. In 1998, EPA hosted an Asia-Pacific Economic Cooperation forum meeting on the uses of environmental technology verification, and, in October 2000, convened the first international workshop on verification, with participation from Malaysia, Thailand, India, and the Philippines. Through these meetings and through its World Wide Web site, the EPA has been able to disseminate the technology test protocols, test plans, and quality assurance plan which form the basis of the ETV Program. Several foreign countries have used these standards when developing technology review and testing regimes. Technology demonstrations and technology assistance projects have helped to transfer improved environmental technologies to developing countries. Most notable is the recently completed Murmansk initiative where the EPA worked with the governments of Russia and Norway to upgrade and expand a prototype low-level liquid radioactive waste (LLW) processing facility in Murmansk, Russia. Since the mid-1990s, the EPA has also run technology demonstration/technology assistance programs in the Argentina, China, Ecuador, Mexico, and other countries.

DOE has negotiated several key international clean energy technology agreements, involving 95 countries that either directly or indirectly promote cooperation in the development and deployment of clean energy technologies. Recently, the DOE, the Department of Commerce (DOC), and the AID initiated an effort to establish the Clean Energy Technology Exports Initiative (CETE). One of this program's goals is to launch clean energy technologies into international markets by improving the government role in clean energy research, development, demonstration, and deployment. DOC, the International Trade Administration, the Export-Import Bank (Ex-Im Bank), the Overseas Private Investment Corporation (OPIC), and the Trade and Development Agency (TDA) have all put in place programs to support and sustain private sector activity and involvement in sustainable development. The Office of Environmental Technologies Industries (ETI) at Commerce provides information, advocacy, trade promotion and trade development support for U.S. producers of environmental technologies, goods, and services. The Ex-Im Bank, the OPIC, and the TDA have developed specific programs to address sustainable development issues and requirements. The ETI/Commerce and EPA co-chair the Environmental Trade Working Group, an interagency effort to coordinate international commercial programs focused on the environment. For more information on these programs, refer to Chapter 2.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: The actual transfer of technology is usually only one component of the U.S. Government's efforts to promote the use of environmental technologies. Capacity building, education, training, and awareness-raising are essential to ensure that the identification, assessment, and proper use of new technologies are part of a holistic solution to environmental problems. The U.S. Government works with its partners (foreign governments, NGOs, industry groups, etc.) to promote such an integrated approach. DOE's international activities often lead to further cooperation and capacity building among nations, and they frequently provide a channel for the transfer of environmental technologies. Descriptions of a number of climate technology cooperation projects undertaken by the DOE and other U.S. agencies can be found on the World Wide Web at: http://www.usaid.gov/environment/climate_technology_cooperation_activities.pdf.

Technology transfer is usually one component of EPA's international capacity-building programs. EPA's capacity-building projects strengthen legal, regulatory and enforcement regimes while driving the demand for improved monitoring technologies, cleaner production systems, and improved waste treatment. Technical assistance projects and training courses enhance skills in selecting, using, and maintaining technologies. Verification programs,

databases, and demonstration projects also help industrializing countries to identify improved technologies and select the most cost-effective solutions to pressing environmental problems.

Information: EPA has created several electronic information resources that assist government and industry representatives worldwide in identifying environmental technologies or improved processes. These resources include:

- The International Cleaner Production Cooperative (<http://es.epa.gov/cooperative/international/>), an on-line portable to best practices and technologies for industrial re-engineering and pollution prevention.
- REACH-IT (<http://www.epareachit.org/index3.html>), a Web site which allows users to search, view, download, and print information about innovative remediation and characterization technologies.
- Design for the Environment (<http://www.epa.gov/opptintr/dfe/>), a program that helps businesses incorporate environmental considerations into the design and redesign of products, processes and technical management systems. Though the program's Web site, users worldwide can obtain detailed environmental, economic, and performance information on traditional and alternative manufacturing methods and technologies.
- Environmental Technology Verification (ETV) Web site (<http://www.epa.gov/etv>) includes all testing protocols, test plans, and verification reports from the EPA's program, which assesses the performance of environmental technologies.

The United States Geological Survey (USGS) provides long-term national, regional, and global data on the flow of materials in the U.S. economy. It also provides information and analyses essential for development of sustainability indicators and for resource conservation and recycling to government agencies, industry, academia, and the public. The USGS (1) monitors and analyzes trends in domestic international mineral exploration activities; (2) analyzes and reports on emerging technologies, societal shifts, and government policies which affect materials availability; (3) works with the World Resource Institute to examine the materials basis of industrial economies; (4) analyzes materials use in the U.S. and the world; (5) works with the Interagency Working Group on Industrial Ecology, Material and Energy Flows to better coordinate Federal government activities in industrial ecology and materials flow issues; (6) develops indicators of sustainable development of mining and energy resources; and (7) trains the U.S. Department of State's Regional Reporting Officers to familiarize those who collect information on industrial activities, including mining, and assist U.S. citizens in geology and mineral resources and the international mineral extraction industry who are posted throughout the world. The USGS's work is accomplished through collaboration with the USDA, DOE, EPA, and the Executive Office of the President, Council on Environmental Quality. The USGS publishes its data in various media -- including CD-ROM and through digital databases on the Internet -- and in various journals.

Research and Technologies: Research activities are underway and technology developed and transferred in a number of federal agencies. The EPA maintains a Small Business Innovative Research program, which makes awards to small, high technology firms for research and development of cutting-edge technologies. The program is intended to spawn commercial ventures that improve the environment, create jobs, and improve the international competitiveness of the U.S. environmental technology industry. DOE, one of the largest sponsors of basic and applied research in the United States, supports research, development, demonstration, and deployment activities across all fuel sectors and all sectors of the economy, leading to technology cooperation activities in all regions of the world.

Financing: No information available.

Cooperation: This report contains innumerable examples of the cooperative efforts undertaken by U.S. agencies to assist countries access technologies. Please refer to individual chapters of this report for this information.

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CHAPTER 17: PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES

Decision-Making: The National Security Council (NSC) Policy Coordinating Committee on Global Environmental Affairs, which includes all U.S. maritime, marine and coastal agencies, has primary responsibility for interagency coordination of ocean policy. Members of the National Oceans Policy Coordinating Committee, led by the Department of State, work together to develop recommendations for U.S. oceans policies and activities. Domestic coastal and oceans affairs are handled by numerous agencies, principally the National Oceanic and Atmospheric Administration (NOAA), U.S. Environmental Protection Agency (EPA), U.S. Coast Guard (USCG), National Parks Service, Fish and Wildlife Service, Minerals Management Service, and the U.S. Geological Survey (USGS). Additionally, non-governmental organizations have an advisory role in the national and local agenda-setting processes. These organizations include various private sector organizations representing industry, environmental interests, small-scale artisanal fishermen, indigenous people and many other interested groups. Under the Coastal Zone Management Act, activities within the U.S. Exclusive Economic Zone (EEZ) that affect the coastal zone must be consistent with coastal zone management plans developed by the states. Prior assessment of the impact of major federal actions on the marine environment is required under the National Environmental Policy Act, and is specifically made applicable to activities on the outer continental shelf by the Outer Continental Shelf Lands Act. Other significant U.S. laws regulating activities in the ocean include: the Clean Water Act, the Marine Protection, Research and Sanctuaries Act, the Marine Mammal Protection Act, the Oil Pollution Act, the Toxic Substances Control Act, the Federal Insecticide, Fungicide and Rodenticide Act and the Clean Air Act. Most recently, the Oceans Act of 2000 has established a Commission that, in coordination with the States, a scientific advisory panel and the public, will develop a National Oceans Report by October 2002. The President will respond to this report with a comprehensive “National Oceans Policy” that will be submitted to the U.S. Congress in February 2003.

With respect to the regulation of ocean fisheries in the U.S. EEZ, the Secretary of Commerce, through NOAA, has primary decision-making responsibility in conjunction with eight Regional Fishery Management Councils. NOAA also administers fisheries management programs covering highly migratory species. Public input is sought and incorporated at many stages of the decision-making process. The Magnuson-Stevens Fishery Conservation and Management Act and the Sustainable Fisheries Act provide the legislative basis for U.S. fisheries management. At the global level, the U.S. has ratified the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, as well as the 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas. Since 1992, the United States has become a party to several regional fisheries management agreements, including the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries, the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, the North Pacific Anadromous Stocks Convention, the Inter-American Sea Turtle Convention and the Agreement on the International Dolphin Conservation Program.

The United States also is an active participant in global environmental management activities for the ocean. Examples of significant international agreements for the U.S. include: the London Convention, the Convention for the Prevention of Pollution from Ships (MARPOL 73/78), the Cartagena Convention and its protocols, the South Pacific Regional Environmental Program (SPREP), the Convention for International Trade in Endangered Species (CITES), the Convention on Persistent Organic Pollutants (POPs), the Global Plan of Action on Land-Based Sources of Marine Pollution (GPA), the International Coral Reef Initiative (ICRI), the Arctic Council and regional agreements with Canada, Mexico, and Central America. The U.S. is working with international partners through

the International Maritime Organization (IMO) to develop new global agreements on harmful anti-fouling agents and invasive species introduced through the discharge of ballast water.

Programmes and Projects: The primary marine fisheries legislation for the U.S. EEZ and continental shelf is the Magnuson-Stevens Fishery Conservation and Management Act and the Sustainable Fisheries Act. 1996 amendments emphasized and strengthened its provisions, mandating a program of rebuilding overfished stocks and managing for sustainability. The amended law is fully complementary to the UN Straddling and Highly Migratory Fish Stocks Convention, providing the United States with the tools necessary to manage fisheries for sustainability. The U.S. Coast Guard enforces laws protecting fisheries and marine species.

Land-based sources of pollution are managed under U.S. domestic and international programs, such as the Coastal Zone Management Program, National Pollutant Discharge Elimination System Permit Program, the Dredge and Fill program, the National Estuary Program, the Beach Program, the National Fish and Wildlife Contamination Program, the Invasive Species Program, the Global Climate Change Program and the Air Deposition Initiative. These programs include measures and procedures to protect watershed areas, coastal resources and ocean areas from point source and non-point sources of pollution. Other Federal programs include the Water Quality Standards and Criteria Program, which provides guidance on water quality criteria to protect the nation's surface waters, management of the Great Waters Program to reduce deposition of pollutants from air emissions and collaborative interagency programs, such as the National Dredging Team, Coastal America, the U.S. Coral Reef Task Force, the Marine Debris Program and the Invasive Species Council. A number of Federal agencies participate in these programs to provide coordinated leadership in protecting environmental coastal and ocean resources. The Oil Pollution Act of 1990 includes a broad range of programs and regulatory requirements to improve prevention, response preparedness, containment and recovery from spills. The Act strengthened liability and compensation tools and created a clean-up trust fund.

In 2001, responding to recommendations from a U.S. Presidential Panel on Ocean Exploration, the United States initiated a program to undertake new activities to explore the oceans. The goal of NOAA's Ocean Exploration Program will be to discover new species, ocean processes, cultural antiquities and artifacts and biological and mineral resources. The program encourages discovery-based science, and promotes collaboration between multiple partners and across disciplines. By undertaking coordinated expeditions employing a full array of modern ocean technology, these explorations will survey, characterize and define diverse and previously unexplored marine environments.

The U.S. Government manages large-scale regional programs, in cooperation with States and local stakeholders, to protect some of the nation's outstanding environmental resources including: the Great Lakes, the Chesapeake Bay, the Gulf of Mexico, the San Francisco Bay, CALFED Bay-Delta Program and Southern California Bight Program. The United States works with its international partners to manage land-based sources of pollution in the Wider Caribbean Region, the U.S.-Mexico Border area, the South Pacific and the Arctic. The international community has identified the need to improve its capacity to monitor the state of the world's oceans. The Global Ocean Observing System (GOOS) has been under development with substantial U.S. participation in response to that need. Eight agencies of the U.S. government established in 2001 a central "Ocean. US" Office to provide information related to observation, communication, and data management associated with the study of oceans world-wide. The focus of this effort is on developing an integrated ocean observing system as a U.S. contribution to GOOS. GOOS provides a framework that when implemented will ensure that the nations of the world are able to document the changes in the physical, chemical and biological state of the ocean. GOOS are sponsoring a Global Ocean Data Assimilation Experiment and a major enhancement of the ocean floats (Argo) that collect data from the upper ocean.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: NOAA's National Marine Fisheries Service, with the facilitation of the U.S. Department of State, regularly provides training to developing countries to promote

measures to reduce by-catch of protected species in fisheries operations, including training in the design, installation and use of sea turtle excluder devices. Public education about marine environmental protection is provided through the USCG's Sea Partners campaign at www.uscg.mil/hq/g-m/nmc/seapart.htm. The U.S. Agency for International Development (USAID) capacity-building programs in the area of coastal management is described below in the section on cooperation. NOAA's Ocean Explorer website (<http://oceanexplorer.noaa.gov>) chronicles and documents missions supported by the Ocean Exploration Program. All principal investigators and mission participants in the Ocean Exploration Program are required to provide materials for this site. Investigators also are required to facilitate additional education and outreach activities that may entail such things as arranging an at-sea experience for a classroom teacher or educator/media person.

EPA maintains several websites with information on capacity building, education, training and awareness-raising related to watershed, coastal and ocean issues. The website (www.epa.gov/owow) includes important interactive resources such as: the Watershed Academy with online and linked resources, the Watershed Information Network that provides a roadmap to information and services, the Surf Your Watershed website that allows users to map environmental information, and a host of other websites and information about significant, national, environmental issues. In addition, EPA offers access to information links to premier scientific research activities in the field of coastal and marine environmental evaluations (www.epa.gov/ord).

Information: The U.S. government actively develops and disseminates vast amounts of information related to the protection of oceans and coastal regions. Among these many activities are the development of socio-economic and environmental indicators, systematic observation systems, watch programs and clearing-houses, as well as capacity building and training programs. Several comprehensive databases (National Estuarine Inventory, National Coastal Discharge Inventory, National Status and Trends Program, etc.) are used by the U.S. Government, private sector or universities and cover all relevant issues in coastal zones. In addition, the USGS is compiling a nutrient concentrations database for estuaries, and in conjunction with NOAA has developed an interactive model providing hydro-meteorological information for spill prevention and cleanup that can be accessed at <http://sfbay.wr.usgs.gov/access/wqdata/>. Since the 1972 enactment of the Coastal Zone Management Act, environmental assessments of coastal and marine areas are undertaken at least every two years. The United States is able to measure improvements and changes in the coastal and marine environment primarily through the National Status and Trends Program. U.S. capacity to measure change will be strengthened with the full implementation of GOOS. The U.S. government provides many types of information on fisheries, such as the publication series *Our Living Oceans and Fisheries of the United States*. This information and more can be found at www.noaa.gov websites.

Research and Technologies: The United States helped launch a process to establish a multinational initiative for an International Research Institute (IRI) and network dedicated to world-class scientific research and education on forecasting on year-to-year climate variability. It took the lead on developing the clearinghouse activity called for in the GPA. The United States plays a significant role in the Intergovernmental Oceanographic Commission (IOC), Intergovernmental Panel on Climate Change, World Weather Watch, Earth Watch, International Mussel Watch, International Council for the Exploration of the Sea (ICES) and the North Pacific Marine Science Organization (PICES). The United States notes the importance of paragraph 17.118 of Agenda 21 that calls for the UNGA to provide for regular consideration within the UN system on general marine and coastal issues, including environment and development items.

EPA manages the Environmental Monitoring and Assessment Program (EMAP). EMAP is a research program to develop the tools necessary to monitor and assess the status and trends of national ecological resources, including oceans and coastal regions. EMAP's goal is to develop the scientific understanding for translating environmental monitoring data from multiple spatial and temporal scales into assessments of ecological condition and forecasts of future risks to the sustainability of our natural resources. EMAP's research supports the National Environmental Monitoring Initiative of the Committee on Environment and Natural Resources (CENR). EMAP objectives are to advance the science of ecological monitoring and ecological risk assessment; guide national monitoring with

improved scientific understanding of ecosystem integrity and dynamics and demonstrates the CENR framework through large regional projects.

The USGS is engaged in coastal and wetlands research in many of the U.S. coastal regions, addressing such topics as assessing saltwater intrusion into freshwater aquifers, ground-water discharge into coastal ecosystems, and the effects of nutrients, pollutants, and invasive species in coastal waters. It is developing methodologies for coastal wetland restoration that address land subsidence, coastal and estuarine fisheries and shellfish nurseries, habitat for waterfowl and coastal wildlife, and hypoxia in the Gulf of Mexico. The USCG is also conducting research on how coastal wetlands are keeping pace with current and predicted rates of sea-level rise, which critical processes control elevation change, and how current management practices affect elevation and vulnerability to submergence. In addition, the USGS is conducting research on vulnerable coral reefs in U.S. waters, mapping reef tracts, studying recovery following hurricane damage and examining the effects of reefs on sediment transportation and beach erosion. From 1984 to 1991 the USGS mapped the U.S. EEZ by using a long-range sidescan-sonar system called GLORIA. The resulting imagery is available in a CD-ROM from USGS.

Financing: No information available.

Cooperation: The United States cooperates with other countries both globally and regionally to protect the ocean and coastal regions. It has not yet ratified the UN Convention on the Law of the Sea, but as a matter of policy acts consistent with its provisions concerning traditional uses of the oceans. The Convention serves as a comprehensive framework with respect to the uses of the oceans. It creates the structure for the governance and protection of all marine areas, including the air space above and the seabed and sub-soil below. The United States signed the accompanying Agreement Relating to the Implementation of Part XI of the Convention on July 29, 1994, and indicated its intent to apply the Agreement provisionally pending ratification (although provisional membership in the International Seabed Authority ended in November of 1998). The United States hosted the UNEP-organized conference on land-based sources of marine pollution in 1995, which resulted in a Global Plan of Action to deal with this serious problem. It also spearheaded international efforts in 1993/94 to call for a ban on all radioactive waste dumping at sea and the related 1996 protocol to the London Convention. The United States has also actively supported negotiations for, and entry into force of, the 1995 UN Fish Stocks Agreement and the 1993 FAO Compliance Agreement.

Internationally, the United States promotes sustainable development of freshwater, coastal and marine resources through USAID's Water and Coastal Resources Program. USAID, along with other federal agencies, provides leadership to international efforts to address the needs for integrated coastal and freshwater resources management, preservation of aquatic biodiversity and reduction of pollution from land-based activities. USAID actively supports the ICRI and the sustainable management of mangrove and other coastal ecosystems. Since 1992 the United States has provided bilateral and multilateral financial assistance to implement activities to address the sustainable development of small islands and developing states. The U.S. Coast Guard cooperates with other nations in preparing for response to oil spills and provides technical assistance in responding to major oil spills. The United States cooperates in the implementation of numerous fisheries agreements. It implements the Code of Conduct for Responsible Fisheries, a guideline for achieving sustainable fisheries, within the U.S. EEZ, as well as the four International Plans of Action adopted under FAO auspices in 1999 and 2001 to address fishing capacity, sharks, seabird by-catch and illegal, unregulated, and unreported fishing. It also supports efforts to protect and conserve endangered species of sea turtles, including as a party to the Inter-American Sea Turtle Convention and as a signatory to the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and Southeast Asia. In addition, the United States cooperates with other States regarding living marine resources in a wide variety of international institutions, fora and arrangements.

NOAA has been extensively involved in the development and execution of a number of cooperative Large Marine Ecosystem (LME) projects around the world to meet the needs of developing countries. Presently, there are eight Global Environment Facility-financed LME projects underway involving 60 developing countries, with eight more

projects under development. NOAA has developed the “5 Module” approach to these LME projects (productivity, fisheries, pollution and ecosystem health, socio-economics, and governance). Within the United States, EPA’s National Coastal Assessment Program, known as Coastal 2000, is a five-year effort to evaluate assessment methods that have been developed to advance the science of ecosystem monitoring for estuaries and offshore ocean waters. The strategy for Coastal 2000 focuses on a strategic partnership with all 24 U.S. coastal states. Each state will conduct the survey and assess the condition of its coastal resources. The results will be aggregated to assess the conditions at regional bio-geographical and national levels; this information will be available for international efforts. Coastal 2000 is the result of cooperative coastal management planning between EPA, other Federal agencies, the 24 coastal states and tribes under the National Coastal Research and Monitoring Strategy. Coastal America, a program of the U.S. Coast Guard, joins federal, state and private entities to promote the protection and restoration of coastal areas in the United States, including through public education.

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CHAPTER 18: PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES.

Decision-Making: Twelve standing committees in the House and Senate have direct jurisdiction over various components of federal water resource policy. The complex federal executive responsibilities for water resources reflect the multiple congressional legislative responsibilities, which in turn mirror the multiple competing interests for water in the United States. Most decisions relating to surface water uses are made at the state level in the United States according to a variety of common law, federal law, and state statutory approaches that differ greatly from state to state. All citizens have extensive legal rights to fully participate in rule making and decision-making under federal and state laws in the United States. The principal law governing pollution of the nation's waterways is the Federal Water Pollution Control Act, or Clean Water Act (CWA). Under the Oil Pollution Act of 1990, a number of agencies participate in preparing for response to spills of oil and require private entities such as pipelines, vessels, marine terminals, and oil refineries to plan for response, and similar requirements are in effect to minimize impacts of hazardous materials spills. The U.S. Coast Guard is responsible for our national marine safety program, and ensures that inland navigable waters are protected from spills.

To commemorate the 25th anniversary of the Clean Water Act, the White House asked federal agencies to develop and implement a comprehensive plan that would help revitalize the nation's commitment to our valuable water resources. The result was the Clean Water Action Plan in February, 1998. The key actions described in this Action Plan focus on achieving cleaner water by strengthening public health protections, targeting watershed protection efforts at high priority areas, and providing communities with new resources to control polluted runoff and enhance natural resource stewardship. The Department of Agriculture, Environmental Protection Agency, Department of the Interior, Department of Defense (including U.S. Army Corps of Engineers), Department of Commerce (through the National Oceanic and Atmospheric Administration), Tennessee Valley Authority, Department of Energy, Department of Transportation, and Department of Justice have been working with tribal, state, and local partners to implement the 111 key actions in the Action Plan and build a new framework for watershed protection.

Programmes and Projects: The major law that controls the quality of drinking water in the United States is the Safe Drinking Water Act (SDWA). The Environmental Protection Agency (EPA) implements a wide range of programs to protect the nation's freshwater resources. The core of these is a series of regulatory programs to protect the quality of the nation's waters under the CWA. Implementation of the CWA is primarily carried out at the state level, but EPA and states jointly participate in compliance monitoring and enforcement activities in support of the regulatory program. EPA and the states similarly share responsibilities for compliance monitoring and enforcement of the SDWA. EPA has an active, well-established compliance and enforcement program to ensure that water resources are protected from contamination and that all citizens are supplied with safe drinking water. This program uses the full range of tools to promote compliance ranging from compliance assistance to civil and criminal enforcement. The U.S. Army Corps of Engineers (Corps) is the nation's principal public water resources development and management agency, providing approval for most work in waterways and wetlands. These responsibilities include the operation and management of numerous existing water resource projects that reduce flood damages, support inland and coastal navigation, produce hydropower, provide storage for municipal and industrial water supply and irrigation, and provide for water related recreation activities. EPA has primary responsibility for compliance and enforcement of the Corps' wetland protection program. The Department of Energy operates four regional power authorities that manage water reservoirs, dam sites, electric power generation from water and other fuels, and power grids. U.S. Department of Agriculture's Natural Resources Conservation Service's (NRCS) programs focus on upland watershed protection and management and on improving water management on farms, in rural areas, and in small communities. Since 70 percent of America's lands are privately owned, much of this work is accomplished by encouraging voluntary efforts by landowner's rather than by regulation. Financial and technical assistance helps farmers and ranchers to preserve and restore wetlands, reduce

erosion, and improve irrigation water use efficiency and water quality. The Bureau of Reclamation (Reclamation) is the principal water manager in 17 western states, much of which is arid land.

The U.S. Geological Survey (USGS) has the principal responsibility to provide the hydrologic information and understanding needed by others to achieve the best use and management of the nation's water resources. Snow Survey and Water Supply Forecasts run by the NRCS provide western states and Alaska with information on future water supplies. NRCS field staff collects and analyzes data on depth and water equivalent of the snowpack at more than 1,200 mountain sites and estimate annual water availability, spring runoff, and summer stream flows. Individuals, organizations, and state and Federal agencies use these forecasts for decisions relating to agricultural production, fish and wildlife management, municipal and industrial water supply, urban development, flood control, recreation power generation, and water quality management. Additionally, NRCS conducts a National Resources Inventory that consists of 300,000 primary sample units and 800,000 points in the United States to monitor the status and trends of the nation's soil, water, and other natural resources. The data from this annual survey serves as the foundation for policy changes relating to natural resources.

In addition, USGS scientists performed a National Water Quality Assessment, which collected and analyzed data and information in more than 50 major river basins and aquifers across the United States. Along with assessing current conditions, USGS is examining how they are changing over time, and differentiating between effects from human activities and natural features. USGS provides data related to source-water protection and information related to the behavior of toxic substances in water to United States regulators, resource managers, industry, and the public in order to improve decision-making and understanding of environmental contamination problems, conducts research into water-quality related processes and develops new field and laboratory methods. Information from these studies is provided to local, state, and national water-resources managers or is released in the scientific literature, as appropriate; much of the information is available via the Internet. Some recent new methods that have been developed include:

- new and refined hydrologic and geochemical USGS computer models that are used throughout the world;
- techniques to use environmental compounds that are found in water as hydrologic tracers. Thus, stable isotopes are being used to determine the source of specific compounds, such as nitrate in the water; contaminants such as sulfur hexafluoride and freon are being used to determine the age of relatively recent ground water in order to help identify vulnerable ground water resources; and heat is being used to trace the interaction of surface and ground-water; and
- new techniques for high-resolution logging that integrate subsurface geophysics and hydrology, being used to better understand the regional flow of ground water.

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) includes the forecasts in their river forecasting function. The NWS is required to provide river and flood forecasts to water resources managers and to flood management organizations at the federal, state and local level. The Tennessee Valley Authority (TVA) is a wholly owned federal government corporation established in 1933 to build and manage a system of dams in the Tennessee River basin for flood control, electric power, navigation, and recreation. The U.S. Fish and Wildlife Service (FWS) and NOAA's National Marine Fisheries Service, working with the other federal agencies, states, tribes, and private organizations is responsible for conserving, protecting, and enhancing fish and wildlife and their habitats. USAID is the primary institution within the U.S. government responsible for providing financial support and technical assistance to further global sustainable economic development.

Status: Accomplishments of the actions in the Clean Water Action Plan (www.cleanwater.gov) include:

- Focusing on Watersheds - The first national, coordinated assessment of watershed conditions and statement of priorities by states and tribes. Funding and technical assistance available to local communities to build capacity for watershed restoration actions. National awards for innovative watershed projects.
- Protecting Public Health - A strategy to reduce health risks from toxins, such as mercury, in fish.

Federal agencies working together to assist states, tribes, and local governments as they work to assess and protect sources of drinking water. An emergency response plan to coordinate federal assistance to state and local governments to respond to outbreaks of harmful algal blooms, such as *Pfiesteria*. A beach action plan to improve beach water quality programs.

- Expanding Citizens' Right to Know - A watershed information network on the Internet that describes watershed programs and services and the health of more than 2,000 watersheds: <http://www.epa.gov/win/> A new Internet database listing beach closings, advisories, and unmonitored Areas: BEACH Watch website: <http://www.epa.gov/OST/beaches/>
- Controlling Polluted Runoff - A national strategy to minimize threats to water quality and public health caused by animal feeding operations. An additional \$100 million in Clean Water Act funding to curb polluted runoff and help implement watershed restoration action strategies. Twenty-nine coastal state polluted runoff management programs have been conditionally approved. New controls of storm water runoff from smaller storm sewer systems in urban areas and smaller construction sites.
- Incentives for Private Land Stewardship - Installation of more than 720,000 miles of protective buffers under the National Conservation Buffer Initiative. More than \$1 billion in federal financial incentives to eight states to remove sensitive lands from agricultural production and encourage use of conservation practices. A user-friendly technical assistance manual on stream corridor restoration technology. Recognition of twelve stream corridor showcase watersheds around the country that demonstrate sound techniques for restoring the natural ecology of rivers and streams.
- Protecting Public Lands - A program to improve or restore 25,000 miles of stream corridors by 2005. A unified policy to strengthen watershed health on federal lands. An increase in projects to clean up rivers and stream polluted by coalmine drainage. Major clean-ups of watersheds polluted by abandoned hardrock mines.
- Restoring and Protecting Wetlands - A strategy to achieve a net increase of 100,000 wetland acres per year by 2005. Restoration and enhancement of nearly 15,000 acres of wetlands in high priority watersheds together with private partners. Federal support for the Five Star Restoration Program for citizens, organizations, corporations, youth groups, landowners, and government agencies to work together to restore wetlands and river corridors.
- Future Actions - Watershed roundtables around the country to support and help develop community-based watershed efforts across the nation. Watershed restoration action strategies for high priority watersheds. Numeric criteria for nutrients (i.e., nitrogen and phosphorus) in water bodies. A report on the progress of national watershed restoration.

Broadly stated, federal water development policy is viewed as being successful in economic and social terms. As a nation, the United States is using less water today. End-of-pipe water pollution has been greatly decreased as a result of federal control and financing during the last 25 years, although it remains a serious problem in many areas. Soil erosion and associated non-point sources of water pollution from agricultural land have been reduced by 38% since 1982. Net loss of wetlands has also declined dramatically from about 185,000 hectares per year in the 1950's and 1960's to about 13,000 hectares per year in the 1990's. However, agricultural erosion control has leveled off and erosion persists at close to 2 billion tons soil loss each year. Non-point source water pollution from suburban development, and urban runoff has grown rapidly in recent years and is not regulated at the federal level, although States regulate through federal programs, e.g. National Pollutant Discharge Elimination System (NPDES), Nonpoint Source Program and the Coastal Zone Act Reauthorization Amendments (CZARA). The States report that nearly 40 percent of the rivers and lakes remain polluted to varying degrees; groundwater in many areas is subsiding; many of the fish and wildlife are endangered; developers and, while progress has been made, private citizens continue to build homes and businesses in the path of devastating floods; new water supplies are limited; sewage systems need improvement and increased capacity, and public funds are becoming increasingly scarce for new water project development and for ongoing management of existing freshwater resources. Cleaning up the past water resource problems is expensive and will continue into the foreseeable future in the United States.

The design capacity of all the publicly owned wastewater treatment facilities in the United States in 1996 was 160 thousand cubic meters per day. The average flow treated per day in 1996 was 122 thousand cubic meters. Based on USGS information in the United States, about 3-5 percent of all the wastewater flows are recycled. Under the Clean Water Act all discharges to surface waters of the United States must be treated to the level of secondary treatment. In 1996 about 72 percent of the U.S. population received publicly owned central collection and wastewater treatment. The wastewater from more than 90 percent of the population receiving collection was treated to at least secondary treatment level.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: Approximately 1,100 sources of water-related information are presently available across the nation. The USGS manages one of the primary federal databases, the National Water Information System (NWIS). This database provides water quantity and/or quality information at approximately 1.5 million sites (80 percent are wells) including water quality information at 338,000 sites and streamflow information at 21,000 - many in real-time. The USGS also collects, compiles, and reports on water data at 5-year intervals. NOAA's National Weather Service (NWS) provides weather, water and climate forecasts to the nation daily. NOAA also collects, and posts on the Internet, meteorological data from a variety of sources including automated surface observations and meteorological satellites. Over 850,000 river and flood forecasts are produced annually and used by federal, state, regional and local organizations. Weather, water and Climate data forecasts can be obtained at the NWS website www.nws.noaa.gov.

EPA has a water information data storage and retrieval system (STORET), which contains water quality and quantity data for more than 750,000 sites around the nation. EPA also maintains the Permit Compliance System (PCS) that contains information on the compliance status of facilities that discharge wastewater regulated by the NPDES permitting system. Data on compliance with drinking water regulations are collected by state agencies and aggregated by EPA in a system denoted as the Safe Drinking Water Information System (SDWIS). EPA's Community Water System Survey collects financial, administrative and managerial data on public systems every few years. Infrastructure needs are also surveyed periodically. EPA has also created an Internet site (www.epa.gov/surf) that allows anyone to obtain information about any watershed in the United States. EPA's Office of Water is located on the Internet at: www.epa.gov/water. Efforts are under way to link the vast water data bases so that water information can be used for decision making at all levels of government. NOAA administers another water-related data system for managing meteorological information central to the hydrological cycle and data related to coastal waters through partnerships with 34 States through the Coastal Zone Management Act. The USDA NRCS conducts the National Resources Inventory that tracks the conditions and trends of the nations private land natural resources. More information on this inventory as well as other relevant data including water and climate information can be found at <http://www.nrcs.usda.gov/TechRes.html>.

Research and Technologies: No information available.

Financing: Today the United States uses in excess of 1.8 million liters of freshwater per capita per year that is currently made available at a low price averaging 5 cents per 1000 liters, and most of the water goes to agriculture. Costs to the typical U.S. household for drinking water are higher due to expenses for treatment and distribution, yet they are still affordable and represent only about one percent of median household income. Most of the spending on non-capital expenditures goes to maintaining and upgrading an aging water infrastructure. Most of the budgets of the traditional infrastructure agencies are now going to operations and maintenance. Under the Clean Water State Revolving Fund (SRF) the federal government provides grants to the states to capitalize these revolving loan funds, with a 20 percent matching fund requirement from the states. The SRF provides low-interest loans to municipalities to construct and upgrade wastewater treatment works. The federal government has provided \$68

billion from 1972 through 1998 for this program. From 1972-1998 under CWA federal funds provided nearly \$68 billion in federal assistance for the construction of local wastewater treatment systems; and state and local governments contributed more than \$20 billion. A portion of these federal funds helped poorer communities provide basic sewage treatment.

Since 1990, EPA's State Revolving Fund has provided low interest loans for the construction of wastewater facilities. Privately owned water systems in the United States represent a major financial component of the utility business, with over \$14 billion in annual revenues in 1995. Over the next twenty years it is expected that the percentage of the U.S. population receiving central wastewater treatment will increase from 72 percent (1996) to about 88 percent (2016). The cost needed over this period to reach this level of treatment is \$120 billion in 1996 dollars. In addition, USDA's Rural Utilities Service (RUS), Water and Environmental Programs (WEP) provides loans, grants and loan guarantees for drinking water, sanitary sewer, solid waste and storm drainage facilities in total areas and cities and towns of 10,000 people or less. Public bodies, non-profit organizations and recognized Indian tribes may qualify for assistance. WEP also makes grants to non-profit organizations to provide technical assistance and training to assist rural communities with their water, wastewater, and solid waste programs. In Fiscal Year 1997, a total of \$1.3 billion was obligated in loans and grants, including \$936,000 in Emergency Community Water Assistance Grants, \$2.4 million in Solid Waste Management Grants, \$11.9 million in Technical Assistance and Training Grants (TAT), and \$8.6 million in Rural Alaskan Village Grants. For more information, visit <http://www.usda.gov/rus/water/index.htm>.

Cooperation: The United States is party to two bilateral agreements concerning the use of international watercourses: the U.S.-Canada International Joint Commission (IJC) (www.ijc.org) under the Boundary Waters Treaty of 1909, and International Boundary and Water Commission (IBWC) (www.ibwc.state.gov) under the U.S.-Mexico Water Treaty of 1944. In addition, EPA is undertaking additional actions on the Mexican Border Infrastructure under the North American Free Trade Agreement.

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CHAPTER 19: ENVIRONMENTALLY SOUND MANAGEMENT OF TOXIC CHEMICALS, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN TOXIC AND DANGEROUS PRODUCTS

Decision-Making: The U.S. Government has taken an active role in seeking to ensure protection of human health and the environment, and has effectively responded to public awareness and concern over environmental threats to human health posed by toxic chemicals and substances, including pesticides. It has promoted public awareness and involvement as an important element in this process, involving numerous constituent and participating groups at the national, regional, and local levels. At the national level, the federal agencies - including the Environmental Protection Agency (EPA), the Department of Labor's Occupational Safety and Health Administration (OSHA), and seven different agencies within the Department of Health and Human Services (HHS), the Department of Agriculture (USDA), and the Department of Transportation -- play a large role in defining and pursuing environmental health goals pertaining to toxic chemicals and substances through research, administration, and service programs, as well as through appropriate regulatory and enforcement activities. These agencies also provide valuable assistance to state and local environmental departments and health agencies since; while establishment of standards and oversight of their implementation is a federal responsibility, primary implementation and enforcement is a state and local responsibility. The scope and responsibilities of state and local agencies are quite diverse, and vary from state to state. Industrial and environmental NGOs are actively involved as partners in national and local debates involved in governmental efforts aimed at addressing problems posed by toxics.

Programmes and Projects:

- 1) The Chemical Right-to-Know (CRTK) initiative consists of three major components: the High Production Volume (HPV) Chemical Challenge Program; the identification of appropriate release/emission thresholds for persistent, bio-accumulative, and toxic (PBT) chemicals; and the Voluntary Children's Chemical Evaluation Program. EPA is actively implementing each of these initiatives in innovative ways, including cooperative efforts among stakeholders from government, industry, and NGOs. For more information on these CRTK programs, visit <http://www.epa.gov/oppt/chemrtk/index.htm>.
- 2) The United States played a major role in the development of the Stockholm Convention on Persistent Organic Pollutants (POPs Convention) as a part of our commitment to furtherance of Chapter 19 of Agenda 21. EPA Administrator Whitman signed the treaty for the United States, on May 22, 2001, and the President has indicated his intent to submit it to Congress for ratification. The POPs Convention establishes goals and obligations to eliminate or significantly reduce the release into the environment of certain chemicals that are toxic, persist in the environment, bio-magnify as they move up through the food chain, and travel long distances from their source of origin where they can accumulate in the ecosystem at levels which are likely to lead to significant human, wildlife, and environmental effects. For a fact sheet on POPs and the treaty visit <http://www.epa.gov/oppfead1/international/pops.htm>
- 3) The United States is a signatory to the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, and is in the process of developing plans for ratification. As have the other signatories, the United States agreed to implement the PIC Agreement on an interim basis, and has participated in the Interim Chemical Review Committee, the leading technical body on PIC implementation. Once fully implemented by all Parties, the PIC Agreement will move the international community closer to achievement of the objectives of Chapter 19: intensified information exchange on chemical safety, as well as chemical risks, and strengthening of capacities to control trade in banned and restricted products. Additional information on PIC is located at <http://www.epa.gov/oppfead1/international/pic.htm>
- 4) EPA initiated the Design for Environment (DfE) program, which helps businesses incorporate environmental considerations into the design and redesign of products, processes, and technical and management systems. This is accomplished through voluntary partnerships with industry, universities, research institutions, public interest groups, and other government agencies. For more information on DfE, visit <http://www.epa.gov/dfe/>

5) Green Chemistry is the design, manufacture, and use of environmentally benign chemical products and processes that prevent pollution and reduce environmental and human health risks. EPA's Green Chemistry Program fosters the research, development, and implementation of innovative chemical technologies that accomplish pollution prevention in a scientifically-sound and cost-effective manner. To accomplish these goals, the Green Chemistry program recognizes and promotes chemical technologies that reduce or eliminate the use or generation of hazardous substances during the design, manufacture, and use of chemical products and processes. The United States has been a leader in introduction of this concept in the work of the OECD, where it is known as sustainable chemistry, and in its member countries. More about Green Chemistry can be found at

<http://www.epa.gov/opptintr/greenchemistry/>

6) The Emergency Planning and Community Right-to-Know Act (EPCRA) set up networks of local and state-level committees with the mission to develop plans to prevent, prepare for, and respond to chemical accidents.

7) EPCRA also established the Toxics Release Inventory (TRI), which is a publicly available national database of routine annual emissions of over 650 toxic chemicals to air, water, land and off-site disposal. Early in 1993, the President ordered previously exempted federal facilities, including military installations, to report TRI emissions as well as stockpiles of chemicals stored on-site. TRI, complemented by related voluntary programs, has, in many instances, resulted in greater reductions in environmental risk than more traditional command-and-control approaches. For additional information on TRI, go to <http://www.epa.gov/tri/>

8) A significant change in the Federal Hazardous Substances Act (FHSA) since UNCED has been the inclusion of guidelines for evaluating chronic hazards from the exposure to carcinogenic, neuro-toxic, and those toxic substances having reproductive or developmental effects. These guidelines facilitate better interagency and international coordination of policies regarding exposure to such substances. Additional information on FHSA is at <http://www.cpsc.gov/businfo/fhsa.html>

9) The Pollution Prevention Act established a bold national objective that "Pollution should be prevented or reduced at the source whenever feasible". For more information on pollution prevention, visit <http://www.epa.gov/p2/>

10) The foundations of the chemicals control programs in the United States are the Toxic Substance Control Act (TSCA) and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Non-pesticide chemical uses are covered by TSCA, which requires pre-manufacture notification and testing in some cases. FIFRA requires the registration, based on the review of testing data, of the domestic use of any pesticide. A related statute, the Federal Food, Drug and Cosmetic Act (FFDCA) establishes tolerance levels for pesticides residues on foods, including imported foods. For more information on TSCA and FIFRA, visit <http://www.epa.gov/opptintr/> and <http://www.epa.gov/pesticides/>

11) EPA has an active, well established compliance and enforcement program to ensure implementation of TSCA, FIFRA, and EPCRA. This program uses the full range of tools, ranging from compliance assistance to civil and criminal enforcement, to promote compliance.

12) In 1996, the Food Quality Protection Act (FQPA) was adopted, amending FIFRA. The new law establishes a single, health-based standard for pesticide residues in all foods: "a reasonable certainty of no harm." The new standard eliminates long-standing problems posed by different standards for pesticide residues in raw and processed foods. FQPA requires EPA to consider all dietary, drinking water, and non-occupational exposures when setting residue tolerances for and registering a pesticide, and to consider exposure to other pesticides with a common mechanism of toxicity. EPA is reassessing the risks of pesticides that had residue tolerances in 1996 against the new standard, which is to be completed by 2006. In some cases, EPA will assess the cumulative exposure of groups of pesticides, such as organophosphates, with common mechanisms of toxicity. FQPA also requires EPA to reassess all the tolerances (legal residue limits, equivalent of MRLs) for pesticides on food and feed commodities that were in existence as of passage of the Act in 1996. Over 9,500 tolerances will be reassessed under this mandate.

13) The Consumer Product Safety Act (CPSA) and the Federal Hazardous Substances Act (FHSA) address consumer exposure to hazardous chemicals and products, including those manufactured abroad. The Occupational Safety and Health Administration's Hazard Communication Standard requires chemical manufacturers and

importers to evaluate the hazards of all chemicals they produce or import, and transmit hazard information and protective measures to employees through labels on containers and safety data sheets. The United States has actively participated in Program Area B of Agenda 21, Chapter 19 of the UNCED agreements, which addresses the international harmonization of these and other U.S. chemical information requirements. The Globally Harmonized System for Hazard Classification and Labeling is nearing completion, and will soon enter the implementation phase.

14) U.S. Geological Survey (USGS) provides information for sound management of toxic chemicals through research and monitoring of contaminant exposure and effects in the environment. Studies of fish, wildlife, and other organisms, their habitat and ecosystems, provide useful information on such issues as nutrients, sediments, pesticides, industrial chemicals, endocrine disruptors, immune suppressors, acid rain, pharmaceuticals, oil spills, petroleum products, lead shot, mine waste and metals, radio-nuclides, runoff and drain water from urban and agricultural areas, explosives, drilling mud, and fire retardants. USGS studies integrate physical, chemical and biological stressors to discern their influence relative to other factors at a wide range of scales. USGS conducts studies of contaminated habitats, endangered or declining species, or national scale issues such as UV radiation, climate change, atmospheric deposition, water quality and land use change. Investigations of contaminated habitats may develop methods for determining effects, elucidate restoration goals, assess damage to natural resources or monitor restoration progress.

15) The Occupational Safety and Health Act and the Mine Safety and Health Act address occupational exposures to hazardous chemicals.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising: EPA has extensive programs and activities for capacity-building in developing countries and countries with economies in transition. In some cases, these efforts enhance U.S. capacity as well. One of these, co-chaired with UNEP, is the Internet Access Project (known internationally as the Chemicals Information Exchange Network) (<http://www.unitar.org/cwm/>), in which courses have so far been delivered in a number of African countries, thereby enabling authorities to access internet-based information needed for sound management of chemicals at the local level. This effort is being extended to other parts of Africa and other regions of the globe.

Information: The TRI's national emissions database model has been adapted to the unique political and economic situations in many countries, where it is more generically known as the Pollutant Release and Transfer Register (PRTR). The CRTK initiative, mentioned above, ensures that the public is informed in such a way as to make possible its effective participation in protection of human health and the environment. For additional information on TRI, visit <http://www.epa.gov/tri/>

Research and Technologies: No information available.

Financing: No information available.

Cooperation: The United States is actively engaged in international toxic chemical and pesticide work in numerous fora, including OECD, UNEP, UNECE, IFCS, and the North American Commission on Environmental Cooperation. The United States has played a leading role in development of an international system to classify chemicals for their health and physical hazards, and to prepare appropriate labels and material safety data sheets to communicate the hazards to those who may be exposed. The system will be implemented in the United Nations, and a representative of the OSHA has been designated to represent the U.S. government in this new structure.

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CHAPTERS 20 TO 22: ENVIRONMENTALLY SOUND MANAGEMENT OF HAZARDOUS, SOLID AND RADIOACTIVE WASTES

Decision-Making: The majority of waste programs are delegated to the States for implementation with EPA playing an oversight and technical assistance role. The Agency interacts with other federal and state agencies, associations from the waste management industry, engineering and legal firms, communities, tribes, industry, and environmental advocacy organizations in implementing its goals. This interaction takes many forms, including publishing proposed regulations and cleanup plans for public comment, providing technical assistance, conducting training, writing national policies and guidance documents, conducting public meetings on proposed actions, and consulting with industry, engineering and legal firms. Community involvement coordinators and project managers are made available as points of contact to address questions and issues about the decision-making process.

Hazardous wastes: At the federal level, EPA continues to pursue the environmentally sound management of hazardous wastes under key laws, including the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) also known as Superfund. EPA provides policy, guidance, and direction in waste management, provides technical assistance to all levels of governments to establish safe practices, and encourages innovative technologies to address contaminated soil and groundwater.

Solid wastes: State and local governments in the United States continue to have the primary responsibility for municipal solid waste management. At the federal level, the United States continues to pursue the environmentally sound management of solid wastes through implementation of key federal laws including RCRA and the Clean Air Act. Solid waste management is typically regulated by State governments and provided by local governments.

Radioactive wastes: Major legislation governing U.S. radioactive waste policy includes: the Atomic Energy Act; the Marine Protection, Research and Sanctuaries Act; the Energy Reorganization Act; the Department of Energy Organization Act; the Uranium Mill Tailings Radiation Control Act; the Low-level Radioactive Waste Policy Act; the Nuclear Waste Policy Act (as amended); the Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act; the Energy Policy Act; CERCLA; the Federal Facilities Compliance Act; and RCRA. The Federal agencies involved in radioactive waste issues are the Department of Energy (DOE), the U.S. Nuclear Regulatory Commission (NRC), and EPA. States have overall responsibility for ensuring disposal capacity for commercially-generated low-level waste. Environment NGOs, business, industry, and scientific and technological communities are involved at various levels of debate (i.e., local, state and national).

Programmes and Projects:

Hazardous wastes: RCRA is a nationwide program to protect human health and the environment from the risks of improper management of hazardous and non-hazardous solid waste. CERCLA is designed to promote clean-up of sites where past disposal of hazardous substances may now pose a threat to human health and the environment. Some specific programs under these two acts include:

- The RCRA hazardous waste program establishes a comprehensive framework for tracking and regulating hazardous waste from generation to final treatment and disposal;
- the RCRA Brownfields Initiative integrates redevelopment opportunities and RCRA cleanup goals to expedite cleanups and provide environmental and community benefits at abandoned, idled, or under-used industrial and commercial facilities;
- the Corrective Action Program requires RCRA facilities to address the investigation and cleanup of releases of hazardous waste pollutants into soil, ground water, surface water, and air (RCRA Cleanup Reforms is EPA's comprehensive effort to spur progress toward our national 2005 RCRA cleanup goals);
- the Superfund redevelopment initiative supports more widespread use of cleaned up sites by issuing policy and guidance on the integration of cleanup and future uses, by conducting pilots with local governments at 50 sites, and by developing partnerships with private organizations that can help communities turn site use into a reality;

- the Federal Facilities Restoration and Reuse Office (FFRRO) works with Federal entities, like the Department of Defense and the Department of Energy, to help them develop creative, cost-effective solutions to their environmental problems;
- the Office of Underground Storage Tanks (OUST) develops and implements a regulatory program for underground storage tank (UST) systems; and
- the Chemical Emergency Preparedness and Prevention Office (CEPPO) provides leadership, builds partnerships, and offers technical assistance to prevent and prepare for chemical emergencies; respond to environmental crises; inform the public about chemical hazards in their community; and share lessons learned about chemical accidents.

EPA also has an active, well-established compliance and enforcement program to ensure that past contamination is cleaned up, that government costs spent cleaning up sites are recovered where possible, and that future contamination is prevented through proper management of hazardous and non-hazardous solid wastes. This program uses the full range of tools to promote compliance ranging from compliance assistance to civil and criminal enforcement. Finally, since UNCED, EPA has also focused RCRA initiatives on environmental justice through siting, permitting, and public involvement; and identifying disproportionate impacts and Native American tribal issues.

Solid wastes: State and local governments, which have the lead role in waste management in the United States, use integrated waste management strategies that include a mix of waste reduction, recycling, composting, waste-to-energy combustion, and land filling. Currently in the United States, 27 percent of municipal solid waste is recovered and recycled or composted, 17 percent is burned for energy recovery in combustion facilities, and the remaining 55 percent is disposed of in landfills. EPA establishes the regulatory framework for land disposal and combustion of municipal solid waste, and provides information, guidance, and support to State and local governments and the private sector on a wide range of solid waste topics. For example, all organizations in the United States may join WasteWise, which is a free and voluntary EPA program through which organizations eliminate costly municipal solid waste, benefiting their bottom line and the environment. It allows participants to design their own solid waste reduction programs tailored to their needs. With respect to sewerage issues, the federal response continues to focus on implementation of the Clean Water Act. In 1991, the U.S. ceased dumping sewerage sludge in coastal waters.

Radioactive wastes: United States policy continues to emphasize safe disposal of nuclear waste. For spent nuclear fuel and high-level radioactive waste, the Federal Government and commercial nuclear utilities continue to safely store these materials while awaiting the development of a permanent geologic disposal site. As authorized by the Nuclear Waste Policy Act, as amended, the U.S. Department of Energy (DOE) is continuing its efforts to develop a permanent geologic repository, which is an integral part of a permanent management solution for the disposal of spent nuclear fuel and high-level radioactive waste from both civilian and government facilities. Finally, under the Low-level Radioactive Waste Policy Act, states continue to have the overall responsibility to dispose of commercial low-level radioactive waste. The Federal Government continues to manage its low-level radioactive wastes from defense activities.

Status:

Hazardous wastes: During the past 20 years, the United States has made great strides in protecting human health and the environment through safely managing the nation's solid and hazardous wastes and preventing, preparing for, and responding to chemical and oil spills. The accomplishments have made communities more livable by protecting people, ensuring cleaner land, and safeguarding groundwater, the country's primary source of drinking water. This has been accomplished by continually improving and reinventing the way waste management laws are carried out. By simplifying unnecessarily complex regulations, allowing greater flexibility in the means used to protect the environment, and reducing costs and burden to both regulated entities and regulators, greater environmental protection has been achieved in a more common sense fashion. By taking a holistic approach to solving environmental problems, U.S. actions will ultimately make communities more livable.

The Superfund program continues to make progress in cleaning up hazardous waste sites to protect human health and the environment. Since 1980, the national program, along with State and Tribal partners, has made clean up decisions at nearly 85% of 43,546 sites it has assessed. To date, 32,575 sites (75%) have been removed from the Superfund inventory. Since the inception of the Brownfields program, the brownfields pilots have leveraged over \$3.4 billion and 12,000 jobs in cleanup, construction, and redevelopment. Out of 399 awarded assessment grants, a total of 2,600 properties have been assessed with pilot and leveraged funds. Finally, Compliance monitoring and enforcement continue to be a critical component of the hazardous waste program at both the state and federal level.

Solid wastes: Although the United States still records the highest rate of municipal waste generation (2 kg/person/day) among OECD countries, the United States has made great progress in controlling the rate of increase in waste generation and in promoting recycling. More than 40 States have quantitative recycling targets for municipal solid waste ranging from 20 to 70 percent. 2001 marks the seventh year of the WasteWise program. Since its inception in 1994, WasteWise has grown to more than 1,100 corporations, government agencies, universities, hospitals, and other organizations committed to cutting costs and conserving natural resources through solid waste reduction, recycling, and the use of recycled materials. Once a State has put into place the means to oversee and enforce RCRA rules, it may petition the federal government for the right to operate the RCRA program. To date, 46 States have received this right.

Radioactive wastes: The Federal Government has recently made significant progress in addressing radioactive wastes. The United States is operating the world's first deep geologic repository, the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico, to dispose of transuranic defense related-waste. In 1998, USEPA certified WIPP to begin acceptance of transuranic defense-related waste from Department of Energy facilities, and the Department of Energy began disposal operations in 1999. The Federal government is proceeding with the investigative science-based program required under law to determine if Yucca Mountain, Nevada, is suitable for further development as a permanent geologic repository for the disposal of commercial and defense spent nuclear fuel and high-level radioactive waste. The Department of Energy is conducting the scientific and technical work and developing the required documentation to support a Presidential decision whether to proceed towards the licensing phase of a repository development program.

EPA has issued public health and environmental radiation protection standards for the proposed spent nuclear fuel and high-level radioactive waste repository at Yucca Mountain, as required under the Energy Policy Act of 1992. NRC will follow suit by revising its Yucca Mountain licensing criteria in the near future, adopting the EPA's standards. Pollution prevention efforts have significantly reduced the generated volumes of commercial low-level radioactive waste. EPA and NRC have issued joint guidance regarding testing samples of radioactive and hazardous wastes.

Capacity-Building, Education, Training and Awareness-Raising:

Hazardous wastes: EPA has many activities for furthering efforts in this category, including a website (<http://www.epa.gov/oswer/>) with general information on EPA's management of hazardous and solid wastes. More specific activities include:

- RCRA Cleanup Reforms Success Stories, which are posted at <http://www.epa.gov/correctiveaction> and which demonstrate the use of creative and innovative approaches to cleanups;
- RCRA Brownfields Training and Outreach Workshops, which ensure that RCRA program implementers, facilities and other stakeholders understand this priority and are aware of the tools available to achieve expedited cleanup and beneficial reuse;
- Targeted Training Partnership Initiative, which is aimed at developing and implementing a variety of approaches and tools that project managers can use to increase the efficiency of cleanup projects;
- Environmental Response Team, which offers educational programs in emergency response, hazard assessment, the sciences, and cleanup efforts and is primarily aimed at first responders like firefighters and emergency medical services personnel (the Environmental Response Team has also provided technical assistance to the international community when an emergency has arisen); and
- The RCRA, Superfund & EPCRA Call Center, which is a publicly accessible service that provides

up-to-date information, including answering questions, on RCRA, underground storage tanks, CERCLA, the Oil Program, and the Emergency Planning and Community Right-to-Know Act (EPCRA). The Call Center also responds to requests for relevant documents.

Solid wastes: The federal government is helping States and localities plan for safe and cost-effective waste prevention, recycling and disposal by facilitating information exchange, providing technical assistance, setting minimum standards governing the safe disposal of municipal waste, as well as other support for efforts to promote source reduction and recycling.

Radioactive wastes: EPA, DOE, and NRC all have extensive outreach programs to inform the public about activities at WIPP and Yucca Mountain. Programs include printed material (fact sheets, posters, brochures, and newsletters, some of which are multilingual), public meetings, information hotlines, and Web sites (for example, www.ymp.gov). EPA is developing an extensive program to help raise awareness and improve technical capabilities of Tribal groups affected by uranium mining and other legacy radiation issues.

Information:

Hazardous wastes: EPA manages two major national information systems to support its RCRA hazardous waste program: (1) RCRAInfo, which allows cradle-to-grave waste tracking of many types of information (including facility status, regulated activities, and compliance histories) about the regulated universe of RCRA hazardous waste handlers; and (2) Biennial Reporting System (BRS), which is a national system that collects data every two years on the generation, management, and minimization of hazardous waste. EPA is currently reassessing its hazardous waste information needs as well as the needs of states, tribes, and public and private sector customers under the Waste Information Initiative (WIN). Under WIN, EPA is seeking to improve data quality and to meet stakeholders' needs for timely and accurate information about hazardous waste management. For its Superfund Program, EPA maintains a number of databases at the following website: <http://www.epa.gov/superfund/resources/database/index.htm>. These include a compilation of Record of Decision (ROD) abstracts and database of Superfund sites that can be searched by factors such as geographical location and contaminants of concern.

Solid wastes: EPA distributes without charge and without copyright restriction more than 170 different publications on municipal solid waste management practices. In addition to providing hardcopy publications, all publications are available in electronic format on CD-Rom or through the website: <http://www.epa.gov/msw>.

Radioactive wastes: EPA is developing data and representational (Geographic Information System) information on abandoned uranium mines. NRC provides information on spent fuel storage at nuclear power plants (www.nrc.gov/OPA/drycask/sfdata.htm). DOE provides information on waste management across the DOE complex (www.em.doe.gov/em30/wastrept.html) and on shipments of radioactive material generally (ntp.doe.gov) and to WIPP in particular (www.wipp.carlsbad.nm.us/transport.htm). EPA provides information on mixed (radioactive and hazardous) waste management to generators and the public via a web site, which includes full text regulations, guidance, and policies. (www.epa.gov/radiation/mixed-waste/)

Research and Technologies:

Hazardous wastes: The United States is generally recognized as a world leader in the development and utilization of advanced technologies associated with both pollution prevention and hazardous waste treatment. EPA's National Risk Management Research Laboratory conducts research into ways to prevent and reduce risks from pollution that threaten human health and the environment. The laboratory investigates, among other things, methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; and remediation of contaminated sites, sediments and ground water. EPA's Technology Innovation Office (TIO) acts as an advocate for new technologies. TIO's mission within the Superfund program is to increase the applications of innovative technologies for the characterization and treatment of contaminated waste sites, soils, and groundwater. EPA also has the Superfund Innovative Technology

Evaluation (SITE) Program, which encourages the development and implementation of innovative treatment technologies for hazardous waste site remediation and monitoring and measurement.

Solid wastes: EPA is currently conducting extensive research on the operation of municipal solid waste landfills as bioreactors. By recirculating leachate and/or adding additional liquids, biological stabilization is accelerated. This has the potential of increasing gas recovery efficiency, enabling more effective leachate treatment, increasing total site capacity, and achieving a stable site more quickly.

Radioactive wastes: DOE continues to conduct extensive research in site remediation, radioactive waste treatment, and disposal technologies. For Yucca Mountain, DOE is developing innovative methods for repository construction, engineered barrier design (including long-lived waste packages), and performance assessment. WIPP is the only operating deep geologic disposal facility in the world.

Vitrification of high-level radioactive waste is currently being applied within the DOE complex. At CERCLA sites, EPA is conducting studies to further the use of onsite radiation measurement technologies that will reduce costs while ensuring protectiveness.

Financing:

Hazardous wastes: The Superfund law created a \$1.6 billion federal trust fund, financed by taxes on chemical and petrochemical industries. Funding was increased by \$8.5 billion when the law was reauthorized in 1986. Authority to collect taxes expired in 1995, and the Superfund program is now financed in good part through general revenues and cost recovery from responsible parties. The RCRA hazardous waste national program is funded through general federal revenues, while individual state hazardous waste programs are funded by a mix of general state revenues, fees imposed on companies that generate hazardous waste, and federal grants. The costs of complying with hazardous waste regulations are borne by industry.

Solid wastes: Under current policy, it is estimated that the RCRA programme will cost \$234 billion between 1990 and 2020. Municipal solid waste management funding is supported by locally collected user fees and some State and local tax revenues.

Radioactive wastes: NRC's regulatory oversight activities are funded through license and other fees. DOE's activities at Yucca Mountain are funded in part through the Nuclear Waste Fund, to which commercial nuclear power reactor operators contribute. Other DOE and EPA activities are funded through general tax revenues.

Cooperation:

Hazardous wastes: The United States signed the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in 1990, but has not yet ratified it. The United States cooperates in the IAEA, the London Convention, the NEA, and under numerous bilateral cooperation agreements. It also actively participates in many working groups of the OECD, including the Working Group on Waste Prevention and Recycling.

Solid wastes: The United States cooperates with its neighbors, Canada and Mexico, in addressing solid waste and sewage-related issues as they may arise. Also, USAID strives to alleviate problems arising from poor sanitation and contaminated drinking water by assisting local governments in developing countries and in countries with economies in transition to improve and expand urban environmental services and related infrastructure, primarily water supply, sanitation and drainage, and solid waste management.

Radioactive wastes: The United States cooperates in the IAEA, the London Convention, the NEA, and under numerous bilateral cooperation agreements. It also assists other nations in assessing and addressing radiation issues, including legacy contamination from nuclear research. Federal agencies also are active in non-proliferation efforts.

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CHAPTERS 24 TO 32: STRENGTHENING THE ROLE OF MAJOR GROUPS

Women: Decision-Making: There are a variety of federal statutes prohibiting discrimination by recipients of federal funds based on gender and other criteria. The U.S. Women's Educational Equity Act Program promotes educational equity for women and girls, including those women and girls who suffer multiple discrimination based on gender and race. The United States pursues a national policy to promote equality of opportunity and treatment in respect of employment and occupation. To the extent that women still confront bias, discrimination and glass ceiling barriers, they have recourse to the civil rights laws, enacted mainly in the 1960's, 1970's, and 1980's, that make discrimination illegal. Enforcement of laws against discrimination in employment is conducted primarily by the U.S. Equal Employment Opportunity Commission (EEOC), an independent agency, and the Office of Federal Contract Compliance Programs, Employment Standards Administration, Department of Labor. Assessment of the implementation and impact of laws, policies, and programs on women is an ongoing process in which private groups and individuals, the Congress, and other Federal, State, and local government agencies play a role. Programmes and Projects: In fiscal years 1999 and 2000, the U.S. Department of Labor's Women's Bureau (WB) conducted a number of leadership development programs for various groups of women to address real-life employment issues and educate women about the laws that protect them in the workplace. Status: Women in the United States have made significant progress during the 1990's in terms of equal access and rights in the labor force, in education, and in other aspects of society. For example, women accounted for 26 percent of executive, administrative, and managerial workers in 1991, and 45 percent in 2000. Similarly, the natural scientists increased from 26 percent in 1991 to 33.5 percent in 2000, while women farm operators and managers increased from 16 to 25 percent in those same years. In 1991, there were two women Senators and one woman Supreme Court Justice; today's numbers are 13 and two, respectively. Women composed 10 percent of the total U.S. Congress in 1991, but today more than 13 percent. Since 1991, 22 women have been appointed to Cabinet posts. Cooperation: The Convention on the Elimination of All Forms of Discrimination Against Women was signed in 1980 and sent to the Senate for advice and consent to ratification, but has not yet been ratified. Similarly, International Labor Organization (ILO) Convention No. 111 concerning discrimination in employment and occupation was sent to the Senate for its advice and consent to ratification in May 1998, but has not yet been acted upon.

Children and Youth: Decision-making: There is no one agency dealing specifically with children's issues. Federal child labor laws, administered by the United States Department of Labor (DOL) apply to minors under age 18. These laws include restrictions on occupations and hours of work, and prohibitions on employment of minors in farm and non-farm occupations declared by the Secretary of Labor as being hazardous for minors to perform. Every state has additional child labor laws. Programmes and Projects: The U.S. Department of Agriculture (USDA), through 4-H youth development programs of the Cooperative State Research Education and Extension Service (CSREES) enrolls more than 5 million youth each year in programs dealing with such issues as environmental stewardship, environmental education, earth sciences, and natural resource conservation. The government has also sought to reach out to children and youth through environmental education programs such as GLOBE (Global Learning and Observation to Benefit the Environment), which was launched in 1994. DOL enforces the child labor provisions of the Fair Labor Standards Act through comprehensive education and outreach programs directed at young workers, parents, educators, and employers; the development of partnerships with other governmental and non-governmental entities to promote compliance with the child labor laws; public education efforts to foster awareness of and support for child labor provisions, and directed and targeted investigations of employers of young workers. Status: The number of young workers whose employment was found to be in violation of federal child labor provisions dropped substantially over the last decade, and the number of workplace injuries and fatalities to young workers has also continued to decline. Youth unemployment (16-19 years old) was 20.1% in 1992 and 13.1 % in 2000. The Department of Health and Human Services' Agency for Children and Families (ACF) also provides a significant amount of support to children and youths. ACF is responsible for some 60 programs which provide services and assistance to needy children and families, administers the new state-

federal welfare program, temporary assistance to needy families, administers the national child support enforcement system, and the Head

Start program, provides funds to assist low-income families in paying for childcare, and supports state programs to provide for foster care and adoption assistance.

Indigenous People: Indigenous peoples¹ of the United States have an historical relationship with their lands and are generally descendants of the original inhabitants of such lands. In the context of this chapter the term “lands” is understood to include the environment of the areas that the people concerned traditionally occupy. Over many generations, indigenous peoples have developed holistic traditional scientific knowledge of their lands, natural resources and environment. Indigenous peoples and their communities shall enjoy the full measure of human rights and fundamental freedoms without hindrance or discrimination. Their ability to participate fully in sustainable development practices on their lands has tended to be limited as a result of factors of an economic, social and historical nature. Decision-Making: Between 1990 and 1999, the American Indian, Eskimo, and Aleut population increased by 16 per cent from 2.1 million to 2.4 million persons, 1.6 million of whom reside on federal Indian lands totalling more than 56 million acres. These numbers show both that tribes must play a significant role in sustainable development, and that the United States’ pursuit of sustainable development must include consideration of tribes and Indian land. Since 1924, the U.S. Constitution has protected Native Americans when they are not on their own reservations. When on their own reservations, Native Americans are subject to Tribal law, the Indian Major Crimes Act, the Indian Civil Rights Act which sets forth the essential protections of the Bill of Rights of the United States Constitution, as well as many codified federal laws dealing specifically with Indian affairs, and various other federal laws which include special provisions for Indians. The protections afforded to Native Americans while on their own reservations are consistent with U.S. constitutional guarantees. It is important to note that tribal members have the right to vote in local, state, and national elections, just like any other U.S. citizens. Therefore tribal members have access to the U.S. political process.

A special relationship exists between the U.S. Government and tribes. While the diversity of the indigenous North American population makes generalizations difficult (there are more than 550 federally recognized American Indian and Alaskan Native tribes and groups, speaking more than 150 different languages), many tribes and native groups enjoy considerable governmental autonomy on reservations or other Indian lands and Alaska villages. The provision of federal recognition reflects the principle of government-to-government relations founded under the U.S. Constitution and subsequent statutes or treaties. Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, signed in 2000 built upon the consultation policy of five earlier administrations dating back to 1970, as well a 1995 Executive Memorandum. Today, the Bureau of Indian Affairs (BIA) government-to-government consultation policy signed on December 13, 2000 is highly regarded as the best framework from which to develop agency-specific and geographically specific consultation procedures. Although the consultation policy only proscribes federal governmental actions, it nevertheless impacts state and local governments through federal involvement in non-federal activity, such as federal cost-sharing or rights-of-way across federally managed public lands. Thus, where such state or local governmental actions involve federal actions or funding, formal tribal government-to-government consultation is initiated. Programmes and Projects: Due to the federal protections guaranteeing the integrity of Indian lands, the full range of U.S. environmental law dating back to 1970 is applied on federal Indian lands, including the National Environmental Policy Act (NEPA), the Clean Air Act, and the Clean Water Act. In addition to federal standards, some tribal governments have implemented their own environmental standards, which can be more rigorous than federal standards. A number of federal agencies, including the Environmental Protection Agency, the Federal Emergency Management Agency, the Federal Communications Commission and the Departments of Agriculture, Energy, Commerce, Defense, Health and Human Services, Housing and Urban Development, Justice, and Labor have established offices or points of contact specifically to

¹ Current U.S. policy is that indigenous peoples have a right to negotiate their political status within the framework of the nation-state and the freedom to pursue their economic, social and cultural development. In exercising their right to internal self-determination, indigenous peoples have an internal right to autonomy or self-government in matters relating to local affairs, their own priorities, maintain their own political institutions, and participate and be consulted on matters that affect their lives.

address issues affecting or opportunities benefiting Native Americans and their lands and resources. Also, many of these agencies have developed agency-wide policies, based on the concepts of self-governance, the federal trust responsibility, consultation and the government-to-government relationship to guide their work with Indian tribes. For example, the Natural Resources Conservation Service (NRCS) has established 65 full and part time offices on Tribal Reservations to provide ongoing conservation technical assistance to Tribes. The NRCS also has helped Tribes establish 22 Tribal Conservation Districts (an agreement with the Secretary of Agriculture recognizing the district as a unit of the Tribal Government) to support cooperation and assistance to achieve common natural resource conservation goals and objectives. The Indian Self-Determination and Education Assistance Act of 1975 provided the BIA with the authority to contract Bureau operated programs directly to Indian tribes rather than hire additional BIA employees to accomplish those program goals. This contracting provides tribes with opportunities to develop technical capability and governmental capacity to manage their own development programs then paved the way for the 1994 Tribal Self Governance Act (TSGA). The TSGA was amended twice in subsequent years to further streamline and improve the provision of federal resources to participating tribes. Today virtually all tribes participate voluntarily, to some degree, in self-governance compacting and self-determination contracting for programs such as education, community services, and natural resource management. The United States greatly benefited tribes with the passage of the Indian Land Consolidation Act Amendments of 2000, 25 U.S.C. 2201. The stated purpose of the Act is to authorize tribes to sell or exchange any tribal lands or interest in lands for the purpose of eliminating fractional interests in Indian trust or restricted lands or consolidating their tribal landholdings. The Act fosters sustainable development, as it requires tribes to develop acquisition plans, which will also serve as land use planning tools.

Generally, through the federal consultation policy, tribes inform federal officials about what actions are culturally or socially inappropriate; thereby the negative impacts of proposed federal actions can be avoided or mitigated. This goal is embodied in federal laws such as NEPA and the American Indian Religious Freedom Act (AIRFA), and Executive Order 13007 on the Protection of Sacred Sites. The courts have interpreted AIRFA to require that federal departments, agencies, and instrumentalities obtain and consider the views of Indian leaders when a proposed land use might conflict with traditional Indian religious beliefs or practices, and that these federal actors avoid unnecessary interference with Indian religious practices during project implementation. On 24 May 1996, Executive Order 13007 clarified AIRFA and furthered the federal government's commitment to the legislation's goals.

The Indian Health Service (IHS) is an agency within the U.S. Department of Health and Human Services and is responsible for providing federal health services to American Indians and Alaska Natives. The provision of health services to members of federally recognized tribes grew out of the special government to government relationship between the federal government and Indian tribes. The IHS supports a network of 37 hospitals, 60 health centers, 3 school health centers, 46 health stations, and 34 urban Indian health centers to provide services to nearly 1.5 million American Indians and Alaska Natives of 557 federally recognized tribes. Since 1995, several agencies of the U.S. Department of Agriculture (USDA) have also implemented an extensive outreach effort with the Intertribal Agriculture Council (IAC) to increase awareness of USDA services available to American Indian and Alaska Native communities. Primarily through the Natural Resources Conservation Service and the USDA Forest Service, USDA has cooperatively established with Indian tribes 33 full-time offices and 73 part-time offices at tribal headquarters to help tribes to manage, conserve, improve, and develop soil, water, forests, and related natural resources on tribal lands.

U.S. investment in conservation and management of salmon in the U.S. Pacific Northwest is evidence of U.S. implementation of Agenda 21 commitments to recognize that traditional and direct dependence on renewable resources and ecosystems, including sustainable harvesting, are essential to the cultural, economic and physical well-being of indigenous peoples and their communities (Ch 26, v.). The United States has allocated hundreds of millions of dollars annually in an ongoing effort that involves all levels of government. To complement the federal effort, the Northwest Treaty tribes are pooling their resources and staff and co-manage the fisheries. The U.S. effort is not just motivated by the science of preserving species, but also by the importance of salmon to the physical, spiritual, and cultural well-being of the fishing tribes in the region. By adjudicated treaty reserved right,

these tribes are co-managers of the fisheries and are therefore jointly responsible for assuring a sustainable harvest. Tribes also have combined their resources by establishing two inter-tribal fisheries commissions with fisheries expertise equal to that of state and federal agencies. Similarly, six tribes from Wisconsin, two tribes from Michigan, and three tribes from Minnesota have joined together to form the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) to assist the tribes in addressing states' concerns for preserving their resources. GLIFWC's goal is to manage effectively the fish, wildlife, and other natural and renewable resources upon which the tribes depend to exercise their treaty rights and maintain their traditional way of life. The courts have recognized the tribes' rights to protect and manage their resources. Capacity-Building, Education, Training and Awareness-Building: Several U.S. agencies conduct ongoing outreach and education about the special U.S./tribal relationship, noting the intrinsic value of tribal participation and partnership in all levels of American government. To this end, some agencies such as the Department of the Interior's Office of American Indian Trust (OAIT) maintain Internet websites. The OAIT website at www.doi.gov/oait links to useful reference materials explaining the role of tribes and, at the same time, encouraging readers to learn more about indigenous peoples in their studies. With regard to tribal capacity building, EPA maintains a permanent American Indian Environmental Office (AIEO). The AIEO coordinates the Agency-wide effort to strengthen public health and environmental protection in Indian Country, with a special emphasis on building tribal capacity to administer their own environmental programs. AIEO oversees development and implementation of EPA's Indian Policy and strives to ensure that all EPA Headquarters and Regional Offices implement their parts of the Agency's Indian Program consistent with both the Administration's policy of working with tribes on a government-to-government basis and EPA's trust responsibility to protect tribal health and environments. Other responsibilities also include:

- Providing multi-media program development grants to tribes;
- Negotiating tribal/EPA Environmental Agreements that identify tribal priorities for building environmental programs and also for direct, EPA program implementation assistance;
- Developing tools to assist tribal environmental managers in their decisions on environmental priorities;
- Developing training curricula for EPA staff on how to work effectively with tribes; and
- Working to improve communication between the Agency and its tribal stakeholders in a number of ways, including assistance to Agency offices as they consult more closely with tribes on actions that affect tribes and their environments, and support for regular meetings of the Agency's Tribal Operations Committee.

Executive Order 13021, issued on 21 October 1996 addressed capacity building. The Order called upon federal agencies to ensure that tribal colleges and universities are more fully recognized as accredited institutions and that they should have access to the opportunities afforded other institutions and have federal resources committed to them on a continuing basis. Among other objectives, the Order also called on the Federal Government to promote access to high quality education opportunities for economically disadvantaged students and the preservation and revitalization of American Indian and Alaska Native languages and cultural traditions. Today, tribal community colleges also have an expanding curriculum on natural resources and the environment and community planning.

Outside the university setting, Bureau of Indian Affairs' Indian Youth Water Resources Technician Training Program has provided nearly 1,000 high school graduates with a wide variety of natural resources technical skills. Following completion of the course, the students serve their tribal government for a full year where they apply their newly acquired knowledge. Since the start of the course in 1992, a significant number of students have gone on to universities and now hold elected offices. The program's success is even more remarkable considering that prospective students were targeted because of their poor high school marks and lack of vision for their own future. As more than one student has said of the training program, "it brought us hope." Research and technologies: U.S. appreciation for indigenous knowledge and science (IKS) is expressed through ongoing U.S. participation in the Convention on Biological Diversity. Though the United States is not yet a signatory to the Convention, it has nonetheless sought to protect IKS as a corollary to its solemn obligation to preserve the physical, intellectual, and spiritual well-being of tribes. In 1998, the United States conducted regional consultations and took notice of a number of case studies where tribes have addressed biodiversity and ecosystems with a view toward sustainable development. Case studies included:

- 1) The 1992 Zuni Conservation Project, 1992, established by Public Law 101- 486, enable the creation of the Zuni Indian Resource Development Fund. Principal from the Fund is expended to formulate a resource development plan and interest from the Fund is used to support implementation of this Plan.
- 2) Hualapai and Southern Paiute Consortium Ethnobotany and the Glen Canyon Dam Beach/habitat Building Test Flow, 1996.
- 3) Elwha River Ecosystem and Fisheries Restoration, a study leading to the removal of a dam and the restoration of a river ecosystem.
- 4) Exxon Valdez Oil Spill Restoration Program, 1997, incorporating indigenous knowledge and involving three biogeographic regions of Alaska. The case study focused on the restoration of Prince William Sound, Kenai Peninsula, and Kodiak Archipelago/Alaska Peninsula, encompassing three primary ecosystem divisions (Terrestrial, Coastal and Marine).
- 5) The U.S. Minerals Management Service incorporation of “traditional knowledge” in planning for off-shore development.
- 6) The Human Genome Diversity Project and Its Implications For Indigenous Peoples, 1995, by Debra Harry, Northern Paiute Nation, Nevada.
- 7) Patenting Of Life and Its Implications For Indigenous Peoples, 1995, by Debra Harry, Northern Paiute Nation, Nevada.
- 8) Colorado River Indian Tribes (CRIT) Reservation farming, and protection and maintenance of natural resources, 1997.
- 9) The Interior Columbia Basin Ecosystem Management Project, 1997, Richard C. Hanes, Ph.D., U. S. Bureau of Land Management, tribal involvement.
- 10) Concerns of the Confederated Salish and Kootenai Tribes of the Flathead Reservation, 1997.
- 11) Submission to the United States Department of State from the Hopi Tribe Regarding the Convention on Biological Diversity, statement of concerns, 1997.
- 12) The United States Government’s scientific efforts to implement the Convention on Biological Diversity. The International Cooperative Biodiversity Groups (ICBG), 1997, consideration of Indigenous peoples.

Cooperation: The U.S. government has a special legal relationship with federally-recognized Indian tribes where it typically holds legal title to Indian lands in trust status for the benefit of those Indians. Tribal natural and other resources are also held in trust. As directed by substantive federal law, the federal government also has a specified trust responsibility to both protect and make productive Indian property and resources. In fulfillment of this responsibility, the federal government may take legal action on behalf of Indian tribes against third parties. The government does so to protect tribal resources, such as land, water, as well as other rights; to seek compensation for or prevent damage by third parties to tribal resources; and to recover both tribal property and to honor the exercise of rights of which tribes or tribal members have been deprived in the past. In addition, Congress charged the Indian Claims Commission (ICC), established in 1946, with jurisdiction over a variety of pre-1946 claims by tribes against the United States, including those based on treaties and other federal laws, as well as claims based upon fair and honorable dealings that are not recognized by any existing rule of law or equity. 60 Stat. 1049, 1050. The ICC heard and resolved hundreds of tribal claims before 1978 when it was dissolved and its remaining docket was transferred to the Court of Claims. As of 1986, the ICC and the Court of Claims have awarded over \$800 million based on claims filed before the ICC. In addition to this claims process, the United States and tribes participate in settlement negotiations regarding land and water claims. These are formal negotiations that occur in compliance with particular federal rules and negotiated agency guidelines and must comport with due process. More than a dozen significant land and water claims have been concluded since 1990.

Non-Governmental Organizations: Decision-Making: The United States political system gives non-governmental organizations extremely broad access to decision-makers at every level of government and almost every stage of policy making. In addition to the informal access to decision-makers provided by the Constitutional structure of the U.S. political system, laws, regulations, and specific policies often specify formal roles and relationships. Public participation and efforts to facilitate cooperation among interested non-governmental

organizations play a fundamental role in sustainable development. Such efforts can be carried out in a variety of formal and informal structures. Coordinating and collaborating with local governments, regional organizations, sovereign nations, local entities (such as indigenous groups), and other stakeholders strengthen the ability of people and societies to meet their sustainable development goals and facilitate public involvement in policy development and adoption. In addition, partnerships with and among governmental and private/non-governmental entities can promote and facilitate community-based action, voluntary initiatives, and the role of local organizations; and, thereby, make an important contribution toward the achievement of sustainable development goals. There are many formal ways that the Federal Government includes NGOs in policy decision-making processes. Pursuant to U.S. law on Administrative Procedures, or to individual statutes, agencies generally must put rules and regulations through a rulemaking process that provides opportunities for public review and comment before a rule comes into effect. Usually, the agency will develop and publish a proposed rule or regulation in the U.S. Federal Register for public review and comment. The proposed rule will describe a number of aspects of the proposed action, and also contain the text of the draft rule, and will set forth specific indications of how the public may review and submit comments upon the proposal. In general, an agency is required to take these comments into consideration in developing the final rule, and provide an explanation of how specific relevant comments were or were not addressed in the final rule. The process for developing environmental impact assessments builds in public participation at all key stages. Long-term strategic and program planning documents, which identify priority objectives for action and important steps needed to realize objectives, are subject to public review and comment, e.g. the programmatic land and resource management plans, such as required by the National Forest Management Act and the metropolitan and statewide transportation system plans. Stakeholder groups, governments, and the general public must be consulted in plan development, as a condition to receiving Federal funding for transportation programs and projects. Planning documents should be publicly available on Internet sites, public libraries, government offices and elsewhere. Another effective mechanism to solicit public participation is a consultation process with interested stakeholders prior to the publication of a proposed rule – in effect, to seek to negotiate through important issues with such stakeholders at the early, pre-publication stage. This process is helpful in resolving issues on highly controversial rule proposals. To better integrate environmental concerns into U.S. trade policy, in 1994 USTR created the Trade and Environment Policy Advisory Committee (TEPAC). The TEPAC, comprised of 35 representatives of environmental, industrial, agricultural, labor and consumer non-governmental organizations, provides policy advice to the U.S. Trade Representative on issues involving trade and the environment (see also **Chapter 2**). Programmes and Projects: One of the most successful approaches to public participation is establishing mutually productive dialogue at the national level between governments and non-governmental organizations and their self-organized networks in a formal, permanent fashion. The National Rural Development Partnership works to strengthen rural America through collaborative partnerships. It brings together partners from local, state, tribal, and federal governments as well as from the for- and not-for-profit sector. Together, 40 State Rural Development Councils form the primary component of the Partnership to address critical community concerns and opportunities. Each Council creates its own mission, structure, operating guidelines, and action plan; and hires its own executive director. The Partnership's administrative center is a National Partnership Office housed within the U.S. Department of Agriculture. In Washington, D.C., a National Rural Development Council consists of senior program managers from over 40 federal agencies as well as national organizations. More information about the Partnership is available on its web site <http://www.rurdev.usda.gov>. Capacity-Building, Education, Training and Awareness-Raising: Many mechanisms encourage non-governmental organizations to play their partnership role. Two examples include the Network of Forest Practitioners, a grassroots alliance of rural people, organizations, and businesses that have emerged as the National Network of Forest Practitioners with funding and other assistance provided by foundations, government agencies, and others. The Network, now a non-profit organization, exists to find practical ways to integrate economic development, environmental protection, and social justice. Many of its members are in forest-dependent places and are engaged in a wide variety of work including watershed protection and restoration, ecotourism, job training, non-timber forest products, and value-added wood manufacturing. The Network has grown to include others that support its mission including regional and national environmental and rural development organizations, rural development specialists, researchers,

facilitators and mediators, and representatives from land management agencies. More information about the Network is available on its web site (<http://www.nfp.org>). Another example is the National Campaign for Sustainable Agriculture, which is dedicated to educating the public on the importance of a sustainable food and agriculture system that is economically viable, environmentally sound, socially just, and humane. It supports a network of national and grassroots organizations working on agriculture, family farm issues, whole farm planning, land loss prevention, farm and minority workers, food access and security, rural development, and more. The National Campaign works with others, including the Community Food Security Coalition, to bring about lasting changes by promoting community-based solutions. Through education, information exchange, and action alerts it builds understanding about national policy and legislative initiatives underway. More information about the National Campaign is available on its web site (<http://sustainableagriculture.net>). A final example is the 348 Resource Conservation and Development (RC&D) Councils that have been designated by USDA to receive technical assistance to carry out their strategic plans. The RC&D Councils are incorporated as nonprofit organizations and include local elected and public officials and civic leaders representing a specific geographic area (typically 5 to 7 counties). The RC&D Councils must address environmental, economic, and community sustainability issues important to the people they serve. RC&D Councils undertake a wide array of projects, ranging from wildlife habitat improvement to providing emergency home repair assistance to low-income populations or job training or business and job creation. RC&D Councils successfully leverage the modest USDA technical assistance to produce millions of dollars of benefits to their communities. About 80% of the United States is included within designated RC&D Areas nationwide. **Status:** The government has included representatives of NGOs in the National delegation to every session of the UN Commission on Sustainable Development (CSD) as well as to other major international meetings. The government also collaborates with international non-governmental organizations and other institutions in national and regional sustainable development programs. Major group organizations participate occasionally in national and local impact assessment projects and the design and implementation of national sustainable development agenda setting. NGOs participate in a wide range of environmental, economic, and social activities that contribute to and promote sustainable development in the U.S. and abroad. The USTR's Trade and Environment Policy Advisory Committee (TEPAC) provide policy advice on issues involving trade and the environment. **Information:** NGOs and governments work together to establish mutually productive dialogue at the national level. One such example is the Roundtable on Sustainable Forests - a national multi-stakeholder forum of government and non-governmental interests convened and facilitated by the Meridian Institute. As stated in its initial charter, dated February 24, 1999, "the purpose of the Roundtable is to serve as a forum to share information and perspectives that will enable better decision making regarding sustainable forests." According to its charter, the initial focus "is to implement and promote utilization of the Criteria and Indicators (C&I) contained in the Santiago Declaration of the Montreal Process as a means of measuring national progress towards achievement of this goal." The Roundtable has federal and non-federal co-chairs and carries out its activities through Technical and Communication and Outreach Work Groups. Similar national-level Roundtable processes using the C&I as a common framework for sustainable resource management have emerged related to rangelands as well as mineral and energy interests. More information about the Roundtable on Sustainable Forests is available from its web site (<http://www.sustainableforests.net>). **Cooperation:** The Government interacts with international NGOs and other international organizations in sustainable development programs internationally, mostly through the work of USAID. There are also several bilateral and multilateral collaborative initiatives with international major groups in national and regional sustainable development programs.

Local Authorities: Environmental management in the United States is a complex and dynamic system. States, cities, villages, towns, townships, boroughs, counties, parishes, special districts, multi-state commissions, international commissions, and recognized indigenous organizations all share with the federal government responsibilities for environmental management. This structure is the result of the federal system, the nation's belief in the dispersal of authority and responsibility, and in public (citizen) involvement in the exercise of governmental functions. The U.S. Constitution defines the formal roles and responsibilities of the states and the federal government. Generally, states and their own constitutions define local responsibilities. Local and state Government

is made up of 50 states, and large cities and mega-metropolitan communities, as well as hundreds of medium size communities, and thousands of small communities. For thirty years, with the creation of the Environmental Protection Agency (EPA), the U.S. government has joined states and many localities in regulating environmental activities. In states, many different governmental agencies manage, regulate, and promote environmental protection policies and practices; commonly, these are health departments, agricultural agencies, environmental and natural resource agencies. While relations between states and federal agencies have always been characterized by compromise born of necessity, Congress and the public expect a federal (national) agency to maintain adequate stewardship of its responsibilities. They expect states to share substantially in managing many of the activities. Adding to the management challenges are two facts (1) states are not monolithic, in their organizations, approaches, or traditional environmental responsibilities; and, (2) federal agencies cannot force states to adopt particular organizational or management systems.

The state-local relationship is different from the federal-state relationship, although there are some similarities. Generally, States are the definers of the role of local governments in their states and the activities that they may engage in. Since the federal government tends to deal first with the state government and then only secondarily with localities, the federal relationship with local governments in environmental activities is more indirect. At the local government level, environmentally-related activities traditionally have been the provision of public services (such as wastewater treatment, drinking water, and trash removal) and the regulation of land use and personal safety (such as zoning and building codes). Today, local governments are also involved in the regulation and management of activities that affect the environment, such as district-wide air pollution regulation, industrial pretreatment for wastewater discharges, storm water controls, public health protection, and sanitation regulation. In recent years, local governments have been important and active participants in the development of sustainable processes and techniques in their daily operations. At the state level, much of the national environmental program is managed under contractual agreements termed delegations. These agreements define areas of state acceptance of management responsibility for national programs and activities. In addition, many states have independent state laws and responsibilities to carry out. Since the passage of the nation's basic environmental laws thirty years ago, the national government has actively built partnerships with states and localities to carry out the laws' intent.

Management of federal environment programs requires a strong cooperation between all levels of government and the private sector. Within the multi layers of environmental protection, competition surfaces, innovation flourishes, and non-governmental intervention is inspired. Federal stewardship is often achieved through a combination of federal financial support for new activities, and national oversight and enforcement of statutory requirements. Likewise, State and local success is often marked with new approaches and new efficiency born of practical adaptation. Decision-Making: Many people and groups are coordinating and collaborating with state and local governments and other local entities, such as conservation districts, tribal organizations, and groups representing indigenous people and other stakeholders to develop and achieve sustainable development goals and facilitate public involvement in decision-making. Cooperative efforts supplement the endeavors of many private businesses, individuals, and voluntary associations engaged in addressing environmental and social problems, enhancing economic dynamism, and extending economic opportunities. These efforts are both formal and informal; they include knowledge-sharing, public-private partnerships, use of financial incentives and technical assistance to encourage actions by private businesses and landowners, intergovernmental cooperation, and public support for community-led activities. The United States has extensive mechanisms for engaging and including private individuals and organizations in formal decision-making processes. Most environmental statutes, for example, include specific provisions for public participation in the formal decision processes. These avenues of participation are anchored in the nation's fundamental belief in the independence and autonomy of local governments and institutions and the right of private citizens to express freely to their government their concerns. Since the concerns of sustainable development spread beyond the arbitrary lines of political jurisdiction, the President's Council for Sustainable Development (PCSD) created the Metropolitan and Rural Strategies Task Force. The mission of this task force was to encourage and support local and regional collaboration among Federal, State, and local government agencies; public interest and community groups; and businesses to advance sustainable development in metropolitan and rural communities. The PCSD, in 1997, recommended that all levels of government should

ensure substantial opportunity for public participation in all phases of planning and decision making to allow those affected by decisions to have a voice in the outcome.

Basic to any understanding of the United States' environmental management system is the role of private individuals and organizations in formal processes. These avenues are found in most environmental statutes and are anchored in the nation's fundamental belief in the independence and autonomy of local governments and institutions, and the right of private citizens to express freely to their government their concerns. Concepts of more recent vintage, the "maximum feasible participation" of citizens and communities in the decisions affecting their lives and the obligation of the government to share with its citizens information affecting them (citizens' "right to know") figure prominently. These elements of governance are most pronounced at the local government level, but also apply nationally and the state level as well. The United States is a country of organizations and action groups. NGO's, private business organizations, industry councils, and representatives of regulated interests, and organizations representing the elected and appointed officials of states and localities abound. In environmental programs and activities there is involvement and consultation in matters of policy and regulatory development. Federally there are statutorily chartered advisory committees at the national level for citizen-public agency interaction, statutory provision for petitioning and intervention in regulatory and permitting processes and executive orders and statutes that require consultation with states and local governments on issues that affect these entities. These efforts are utilized for issue advocacy, citizen vigilance and accountability of governmental decision making, and for development of litigation and legal advocacy.

Individual citizen involvement and participation is a key element in most environmental programs and activities. Agencies, such as EPA, have established policies to promote these interactions. Generally, these participation policies reaffirm a commitment to early and meaningful public involvement, ensure that environmental decisions are made with an understanding of the interests and concerns of affected people and entities, promote the use of a wide variety of techniques to create early, and when appropriate, continuing opportunity for public involvement in Agency decisions, and establish clear and effective procedures for conducting public involvement activities.

Programmes and Projects: Three examples that demonstrate role and importance of local authorities in implementing Agenda 21 initiatives are: 1) National League of Cities' Institute for Youth, Education and Families; 2) National Association of Counties' American County Platform; and 3) International City/County Management Association's International Resource Cities Program. National League of Cities (NLC)'s Institute for Youth, Education, and Families (YEFInstitute) (http://www.nlc.org/nlc_org/site/programs/institute_for_youth_education_and_families/index.cfm) helps local authorities to implement and monitor programs aimed at ensuring that youth are represented in decision-making, planning and implementation processes. The YEF Institute was launched in January 2000 to strengthen the capacity of municipal leaders to enhance the lives of children, youth, and families. The YEF Institute encourages the inclusion of youth in policy making and other governmental activities at the local level by emphasizing ongoing research and dissemination efforts regarding local youth advisory councils and through youth involvement in NLC activities. Youth delegates aged 15-18 now participate in NLC's December Congress of Cities and March Congressional City Conference.

National Association of Counties (NACo) represents county governments nationally in Washington, D.C. to both the U.S. Congress and federal agencies, and provides insight into legislative and regulatory efforts through the American County Platform. The American County Platform serves as its public policy program and a basis for policy resolutions that address specific concerns of counties. Policy issues being addressed in the 2001-2002 were brought forward by its steering committees include: 1) agriculture and rural affairs; 2) community and economic development; 3) environment, energy and land use; 4) finance and intergovernmental affairs; 5) health; 6) human services and education; 7) justice and public safety; 8) labor and employment; 9) public lands; 10) telecommunication and technology; and 11) transportation. For more information on these steering committees and the American County Platform, visit <http://www.naco.org/leg/platform/httoc01.cfm>. NACo's Platform also is informed by the work of other committees and caucuses, including a Sustainability Leadership Team established in 1993 to examine county government's role in sustainable development. It is now dedicated to researching county-level sustainable development initiatives and making the information available to other counties and interested

organizations. Also NACo, in partnership with the United States Conference of Mayors, established a Joint Center for Sustainable Communities to foster economic development, environmental stewardship, and equity among all citizens through collaborative, cooperative efforts of cities and counties and to provide mayors and county officials nationwide with the tools, resources, and support they need to more effectively serve their constituents. International City/County Management Association (ICMA), in cooperation with USAID, administers the International Resource Cities Program (IRCP). Under this initiative, U.S. cities, counties, or associations are partnered with counterparts in developing and transitional countries to provide technical assistance in improving professional municipal management; supporting participatory and inclusive governance; supporting economic development; promoting sound financial management; and improving delivery of environmental services. Under this initiative, over 30 U.S. cities have been partnered with cities and counties overseas to provide technical assistance. For more information on this program, visit <http://www.icma.org/>. Domestically, ICMA also facilitates partnerships through a variety of efforts including the Smart Growth Network in which ICMA serves as the organizational home and runs its membership program. **Status:** The number of local authorities developing programs to address sustainable development is expanding rapidly. Examples of programs include: Kentucky Sustainable Practices Initiative, Minnesota Sustainable Development Initiative, Colorado Sustainability Project, Sustainable Maine Project, Missouri Sustainability Projects, Montana Consensus Council, Sustainable North Carolina Project, Virginia Task Force on Sustainable Development, Delaware Estuary Program, Governor’s Commission for a Sustainable South Florida, New York Sustainable Development Initiative, Southern California Council on Environment and Development, and Sustainable Wisconsin. In addition, many communities are now monitoring and tracking change through the use of indicators that measure sustainable progress. **Information:** The amount of information sharing is continually expanding through e-government efforts. The National League of Cities (NLC) defines e-government as “the ability of local governments to deliver services and information electronically to customers (residents or businesses) 24 hours a day, seven days a week. This includes: 1) service delivery functions such as ticket payments, bicycle and dog registrations, parks and recreation registrations; 2) economic activity such as business permitting and online procurement; and 3) “Digital democracy” such as council meetings with online civic forums.” Through the NLC-IBM-State Municipal League “Total-e Government” Program (http://www.nlc.org/nlc_org/site/programs/e-government/index.cfm), NLC and interested state municipal leagues, in collaboration with IBM and its e-government partners, will offer a “menu” of e-government services to cities. The program will offer specific e-government applications, education and training programs, and unique opportunities for cities to help shape the development of future e-government services and applications. The initial web services creation application is currently being “pilot” tested by 12 state municipal leagues and more than 60 cities nationwide. For more of information of other e-government efforts, visit Public Technology Inc.’s website at <http://www.pti.org/>. **Cooperation:** Two organizations that promote international cooperation to facilitate the advancement of local authorities implementing Local Agenda 21, cooperating with other local authorities, and enhancing the goal of exchanging information and experience among local authorities are the International Union of Local Authorities and the International Council for Local Environmental Initiatives. The International Union of Local Authorities (IULA) works to promote and unite democratic local government worldwide. Currently, IULA includes more than 400 members in more than 110 countries, and in more than half of these countries, at least one national association or section of local/regional government is active. IULA members have adopted the Worldwide Declaration of Local Self-Government in 1993 and are currently working on a World Charter of Local Self-Government. IULA North America (IULA-NORAM) is one regional section of IULA, whose present Secretariat is held by the National League of Cities in Washington D.C. IULA-NORAM is working towards enhancing the linkages between section members and providing a forum for representatives from member organizations to come together; organizing and conducting special educational programs for local governments in the region, and defining a unique role in fostering trade and economic development in the hemisphere. For more information on IULA, visit <http://www.iula.org> and for more information on IULA-NORAM, visit <http://www.iula-na.org>. The International Council for Local Environmental Initiatives (ICLEI) is an organization for local governments, whose mission is “to build and serve a worldwide movement of local governments to achieve tangible improvements in global environmental and sustainable development conditions through cumulative local actions.” Currently, there are

more than 350 cities, towns, counties, and their associations from around the world that are full members of the Council, with hundreds of additional local governments participating in specific ICLEI campaigns and projects. ICLEI initiatives include Cities for Climate Protection, Freshwater Management, and Local Agenda 21 (LA21). The LA21 initiative works with local governments worldwide that are initiating LA21 planning by undertaking a consultative process to prepare, implement, and monitor local sustainable development action plans. In June 2001, the City of Ann Arbor, Michigan hosted a preparatory conference for the World Summit on Sustainable Development that included 120 visitors from cities, towns, counties, federal government agencies, and non-governmental organizations from North America. For more information on ICLEI, visit <http://www.iclei.org>.

Workers and Trade Unions: Decision-Making: Efforts to promote sustainable development have implications for the workforce and workplace of today and tomorrow. Agenda 21 recognized that workers and their trade unions have an essential role to play in facilitating the achievement of sustainable development. The right to freedom of association is implicit in the U.S. Constitution. The rights of association and organization are supplemented by legislation, including the Railway Labor Act (1926), the Norris-La-Guardia Act (1932), the National Labor Relations Act (1935), the Labor-Management Relations Act (1947), the Labor-Management Reporting and Disclosure Act (1959), the Postal Reorganization Act (1970), and the Civil Service Reform Act (1978), as well as State and local legislation. Status: Workers take some part in National Agenda 21 discussions and implementation. Since 1992, the United States has ratified a number of International Labor Organization (ILO) conventions, including Convention 182 on the Worst Forms of Child Labor; Convention 176 on Mine Safety and Health; Convention 150 on Labor Administration: Role, Functions, and Organization; and Convention 105 concerning the Abolition of Forced Labor.

Business and Industry: Building support for sustainable development among a diverse business community, from small entrepreneurs to large multinational companies is a challenge the United States takes very seriously. Market-driven technologies and innovative approaches developed by the private sector create viable paths to economic and environmental sustainability. Advice from the business community and ongoing cooperative efforts between business and government sectors are critical to the policy-making process and achieving sustainable development. A growing number of U.S. businesses are voluntarily adopting internal sustainable development business plans and are setting the trend for others to follow. Decision-Making: U.S. Congress established the private sector advisory committee system in 1974 to ensure that U.S. trade policy and trade negotiation objectives adequately reflect U.S. commercial and economic interests. Congress expanded and enhanced the role and objectives of this system in three subsequent Trade Acts. This system is arranged in three tiers: the President's Advisory Committee for Trade Policy and Negotiations (ACTPN); seven policy advisory committees; and 26 technical, sectoral, and functional advisory committees. The Office of the U.S. Trade Representative and the Department of Commerce share in the supervisory responsibilities of the Advisory Committee Process. The President appoints 45 ACTPN members for two-year terms; membership must broadly represent key economic sectors affected by trade. The committee considers trade policy issues in the context of the overall national interest. Representatives are drawn from the agriculture, business, labor, environmental and consumer communities. The seven policy advisory committees are the Intergovernmental Policy Advisory Committee (IGPAC), the Trade Advisory Committee on Africa (TACA), the Industry Policy Advisory Committee (IPAC), Agricultural Policy Advisory Committee (APAC), Labor Advisory Committee (LAC), Defense Policy Advisory Committee on Trade (DPACT), and Trade and Environment Policy Advisory Committee (TEPAC). Each committee provides advice based upon the perspective of its specific sector or area. The 26 sectoral, functional, and technical advisory committees are organized in two areas: industry and agriculture. Each sectoral or technical committee represents a specific sector or commodity group (such as textiles or dairy products) and provides specific technical advice concerning the effect that trade policy decisions may have on its sector. The sector specific advisory committees represent each industry broadly, and representatives range from small entrepreneurs to large, multinational companies. The four functional advisory committees provide cross-sectoral advice on customs, standards, intellectual property and electronic commerce issues. Apart from the formal advisory process, U.S. industry trade associations play an active role in furthering

sustainable development goals on a voluntary, informal basis. For example, trade associations representing the energy, chemicals, and forest sectors have actively promoted sustainable development models, goals, and programs among their member companies. These trade associations often cooperate with U.S. government officials in identifying and promoting sustainable business opportunities around the world. In particular, Federal interagency groups working on international sustainable energy development have established and carried out such cooperative efforts with trade groups. As trade has developed and broadened, and awareness of sustainable development goals has permeated U.S. decision-making, the composition of these official advisory bodies has grown to better reflect society's interests in the trading system. In fact, recently the United States began the process of including qualified representatives from the environmental community on two of the Industry Sector Advisory Committees - forest products and chemicals. Programmes and Projects: Throughout the United States, business and industry are involved in local, state, national and international programs and projects, which further sustainable development objectives. Volunteer efforts at the community level are the heart of implementing Agenda 21 goals. At the other end of the spectrum of implementation are several coalitions of businesses, which are interested in the goals of sustainable development. Two of these are the Business Round Table (BRT) and the United States Council for International Business (USCIB). The Business Round Table, an organization of 140 CEOs of major corporations whose members have embraced the trend toward sustainability through a wide variety of tangible actions. While many of these actions have been undertaken in cooperation with governmental bodies, they are primarily voluntary actions that demonstrate how social objectives can be aligned with sound economic judgments. One example is an international voluntary effort by industry to collect health and safety information about the "high-production volume" chemicals in commerce and place that information in the public domain. The BRT developed *Blueprint 2001* – a set of recommendations directed at senior policymakers. BRT members have spearheaded the use of a variety of innovative manufacturing techniques that employ cutting edge technologies for efficient use of energy and water resources across the globe. The United States Council for International Business (USCIB) addresses a broad range of policy issues with the objective of promoting an open system of world trade, finance, and investment in which business can flourish and contribute to economic growth, human welfare, and protection of the environment. With a membership of 300 global corporations, professional firms and business associations, USCIB is the U.S. affiliate of the International Chamber of Commerce, the Business and Industry Advisory Committee to the OECD and the International Organization of Employers.

USCIB has followed and advocated sustainable development issues since the run-up to the 1992 Earth Summit through the USCIB's Environment Committee, whose current chair is the Director of Sustainable Development for a major U.S. corporation. The Committee works to:

- Promote the use of voluntary, cooperative approaches and the exchange of best practices;
- Support sound environmental policies that are scientifically based and economically justified;
- Advance environmental protection and economic development as reinforcing endeavors fundamental to sustainable development; and
- Foster awareness of industry's accomplishments in improving environmental policy and management through voluntary guidelines and programs.

In its ongoing involvement in the U.N. Commission on Sustainable Development and UNEP, USCIB has promoted voluntary initiatives and public-private sector partnerships to improve management practices, products and services from environmental and social perspectives, demonstrating that economic growth and activity need not be equated with environmental impact. USCIB members are demonstrating their commitment to good corporate practice and responsible business conduct through principles developed by companies and through participation in the U.N. Global Compact and other initiatives, such as the Global Sullivan Principles. The USCIB is active both globally and regionally through participation and comment on existing and proposed policy, including OECD environmental guidelines and urging the OECD to integrate sustainable development into its work. The USCIB has also represented U.S. business in the NAFTA environmental institutions, at both the national and tri-national level.

Research and Technologies: Numerous cooperative efforts between the U.S. government and industry are actively advancing sustainable development goals. One such example is the Forest Products Laboratory (FPL) publishes

research findings useful to the general public, industry, regulatory agencies, state and private foresters, educators, and other government agencies. FPL provides technical assistance to those seeking adaptation or adoption of new and/or low cost technologies that will aid in the development of value-added enterprises. Examples of value-added forest products that are being produced from thinnings removed to reduce hazardous fuels while providing sustainable business opportunities for rural, forest-based communities include: Douglas fir flooring in Hayfork, California, and Juniper/plastic signs in Mountainair, New Mexico. More information about research and technology transfer efforts is available on the Forest Serve web site (<http://www.fs.fed.us>). Cooperation: The United States has one of the most comprehensive regulatory systems in the world but also relies substantially on voluntary initiatives to achieve our sustainable development goals. In this respect, government regulators work closely with industry to cooperate in reaching sustainable development goals. For example, EPA's Office of Policy works with selected industries to devise new and better ways to reduce pollution and conserve resources. EPA's mission is to help provide incentives and remove barriers for companies to continuously improve their environmental performance, while easing the costs and burdens of regulation. Most of EPA's work with industry sectors is done through the Sustainable Industry Program. As of January 1999, EPA was working with six different industries: metal finishing, specialty/batch chemical manufacturing, meat processing, metal foundries and die casting, travel and tourism (focusing now on mountain resorts), and photo processing. EPA plans to add new sectors to the program on an ongoing basis.

Scientific and Technological Community: Decision-Making: The U.S. scientific and technological community is a vital segment of American society and its economy. The rapid growth and application of technology in the United States has become an unprecedented multiplier of the channels through which scientific information is available to the American people, demonstrating the complementary roles that can be played by the government, the academic community, and private enterprise. The Internet, cable and satellite television offer numerous channels and sites dedicated to scientific content, which are readily accessible by the public. At the same time, hundreds of diverse academic and popular scientific journals are published annually in the United States. Many non-academic newspapers and news magazines regularly offer science columns and report on scientific events and on technology. U.S. federal agencies that support scientific and technical activities relevant to sustainable development rely on and work closely with researchers in the relevant disciplines who are affiliated with academia, industry, research institutions and professional societies. These scientists and engineers provide independent advice to the agencies on a wide variety of matters. Examples include: governing boards that oversee an entire agency; advisory committees recommending future directions for federal support of research; committees of visitors evaluating current programs; the peer-review process whereby research proposals competing for federal funding receive multiple independent evaluations by scientists with in-depth expertise in the particular topic. Broad questions may be referred to the National Research Council/ National Academy of Sciences, which draws upon its membership, the preeminent scientists and engineers in their fields, to prepare responses, which are generally accepted as definitive statements of the relevant scientific knowledge to date. In 1999, the National Research Council's Board on Sustainable Development, comprising 25 members with background in natural and social sciences and engineering, and with experience in industry and government as well as academia, released a report, *Our Common Journey*, identifying goals and priorities for action for human society to make the transition to sustainability. Other examples of engagement by the scientific community include the U.S. National Academy of Sciences' cooperation with approximately 80 other Science Academies of the world in the InterAgency Council (IAC) to draw upon the best science expertise to provide expert advice on matters relevant to sustainable development to international decision making bodies, such as the UN, the World Bank and other institutions.

A number of independent organizations actively work on sustainable development issues, hold meeting, and inject views into the U.S. WSSD preparation process. An example of this is the National Council for Science and the Environment (NCSE) which held a two-day conference/workshop on Science, Policy and the Environment, Sustainable Communities: Science & Solutions in Washington D.C. in December 2001. Recommendations from breakout workshops were delivered to State Department officials and the WSSD IWG. Another recent example, the development of the National Science Board's report on *Environmental Science and Engineering for the 21st*

Century: The Role of the National Science Foundation, serves to illustrate the process of involving scientists and engineers and other groups in articulating issues, needs, and recommendations. The Board's Task Force on the Environment conducted hearings and town meetings in different parts of the country; solicited input from scientists, government agencies, and the private sector; reviewed hundreds of reports and documents related to environmental research, education and assessments; and sought suggestions through a public web site. Hundreds of suggestions and recommendations were received and considered. Scholars in every scientific discipline participated. Information from these sources was considered by the task force and synthesized into an Interim Report, which was then released publicly and posted on the web site. During the next several months, almost 7,000 hits were recorded for the web site. Comments were received from community groups, local and Federal agency officials, nongovernmental organizations, the private sector, and concerned citizens, in addition to comments from professional organizations representing thousands of environmental scientists, engineers, and educators. These comments were taken into account in producing the final Report. The report now serves as the vision guiding the National Science Foundation in its mission of advancing the fundamental knowledge to address environmental issues. The 2001 USDA Food and Agriculture Policy, *Taking Stock for the New Century*, recognized the critical role of science and scientists in implementing sustainable development objectives. It states that no authorized program, no mandate, no request or emergency need can be carried out unless the appropriate research base, scientists, laboratories, methods, data and information, institutions, and technologies are available. New science is needed to ensure that any new regulations, in food safety, animal and plant health, environment, or other areas, are sound and cost-effective. The latest technologies are needed to support integrated programs and systems. A cadre of highly trained and actively practicing scientists, economists, and other analysts provides a necessary foundation for rapid response across subject areas and programs.

Further it recognizes that collaborations involving public agencies, private companies, universities, and consumers are an important means for meeting the interests of various groups while advancing the public good. As the private sector is playing an ever larger role in agricultural research and information provision, limited public sector research funding needs to be devoted to fundamental scientific discovery and questions that the private sector has no incentive to pursue, but that could lead to the betterment of society. The scientific and technical community is represented on various USDA Advisory Committees, which provide national level policy recommendations on key issue areas such as agricultural biotechnology and small farms. The 1996 Farm Bill established State Technical committees, in which the state's technical and scientific community is represented, to advise on criteria and priorities for conservation programs administered by USDA at the state level. Programmes and Projects: USDA's higher education mission is carried out in strong alliance with States, universities, and the private sector. Recognizing the significance of this alliance, the Food and Agriculture Act of 1977 designated USDA as the lead Federal agency for higher education in the food and agricultural sciences. Through the Cooperative State Research Economics and Extension Service (CSREES) Office of Higher Education Programs, USDA has implemented the charge with a broad array of initiatives to link teaching, research, and extension and improve the training of food and agricultural scientists and professionals. Most of these efforts were informal until 1984, when the Department initiated the National Needs Graduate Fellowships Grant Program to develop expertise in areas with shortages of scientists. This role was expanded significantly in recent years by implementation of the Higher Education Challenge Grants Program, the 1890 Institution Teaching and Research Capacity Building Grants Program, Multicultural Scholars Program, Tribal Colleges Equity Education Program, Native American Endowment Fund, and Hispanic Serving Institutions Education Grants Program, all of which are intended to strengthen the quality of education programs at U.S. colleges and universities. Cooperation/Training/Capacity-Building: Development will not be sustainable without a healthy population, capable of being educated and productive. The National Institutes of Health within the Department of Health and Human Services supports a broad agenda to build research capacity in poor nations while advancing critically needed research on global health issues of concern to both collaborating partners. Through training programs in communicable diseases, including AIDS, tuberculosis and malaria, and other emerging and reemerging infectious diseases, young scientists from the developing world gain the tools needed to better understand and ultimately control these diseases, while preparing them to return home to build

much-needed national capacity. New programs that target the growing burden of non-communicable disease in the developing world, such as mental illness, also link clinical research with the necessary operational and health services research to ensure that new knowledge will quickly be translated into public health policy and practice.

Farmers: Decision Making: USDA establishes formal advisory committees, which include representatives from the farming and ranching community, that develop national level policy recommendations for USDA on issues of concern, such as agricultural biotechnology, research, and small farms. USDA also holds periodic meetings with stakeholders on a variety of issues, such as meeting with farmers to improve applied research projects. Programmes and Projects: Conservation districts and Farm Services Agency (FSA) county committees, each representing local farmers and ranchers, have a role established by the 1996 Farm Bill, in the implementation of USDA conservation programs. State Technical Committees, which include membership of the FSA State Committee, as well as the representatives of conservation districts and other farm and ranch groups offer advice on establishing criteria and priorities for conservation programs at the State level. Conservation Districts which conduct local conservation program outreach, convene local work groups to partner with the Natural Resources Conservation Service, FSA, and FSA county committee, provide leadership for the assessment of natural resource conditions and needs, identify program priorities and resources available, develop proposals for priority areas, and make program policy recommendations. The 1985 domestic agricultural legislation (the Farm Bill) passed by the U.S. Congress authorized USDA to establish the Sustainable Agriculture Research and Education (SARE) Program. SARE provides funding for research, demonstration, education, and extension projects carried out by scientists, farmers, educators, and private sector representatives.

The SARE mission is to increase knowledge about and help farmers and ranchers adopt sustainable practices that are profitable, environmentally sound and beneficial to society. Status: Farms in the United States vary widely in size, structure, and financial characteristics. In 1999, rural residence farms (gross sales less than \$250,000 with farming as the secondary activity for the farm operator) comprised 62% of all farms and 13 percent of the total value of production; intermediate farms (gross sales less than \$1250,000 with farming as the major occupation) comprised almost 30 percent of the number of farms and 42 percent of the value of production; and commercial family farms, while at 8 percent was the smallest percentage of the number of farms and acreage owned, accounted for 68 percent of the total value of production. The small farmers – or intermediate and rural residence farmers – account for nearly 85 percent of all land retired for conservation purposes. The rural residence farms also get most of the payments from the Conservation Reserve Program – a land retirement product – but a small portion of other farm program payments including commodity program and disaster payments. Women are operating a growing share of U.S. farms, increasing from 5 percent in 1978 to 9 percent by 1997. Financing: Fiscal Year 2000 funding for SARE totaled \$11.4 million. By awarding more than 250 new grants each year, SARE continues to explore options that meet current farming challenges and contribute to long-term solutions. Periodic farm legislation has increased farmer involvement in conservation assistance program implementation as well by ensuring farm and ranch representation on newly established local and state technical advisory committees that determine conservation funding priorities.

Cooperation: USDA supports collaboration and partnerships to solve problems, recognizing that the complexities of many contemporary agricultural issues cross the boundaries of traditional programs. Partnerships are pursued with consumers, farmers, landowners, industry, non-governmental organizations, volunteers, and others.

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CHAPTER 33: FINANCIAL RESOURCES AND MECHANISMS

Decision-Making: Over the past decade, sustainable development issues have been at center stage not only at the leading agency for bilateral development assistance, the U.S. Agency for International Development (USAID), but also at the U.S. Departments of State, Treasury, Commerce, Agriculture, Interior as well as Ex-Im Bank, Overseas Private Investment Corporation, Trade and Development Agency, U.S. Trade Representative, Office of Management and Budget, and the White House National Security Council. Previous chapters have noted some of sourcing of financing domestic implementation of Agenda 21. This chapter focuses on U.S. assistance made available for advancing sustainable development goals internationally. Additional information on assistance in specific programs is found throughout the other chapters of this profile. While USAID, Treasury and State have the lead on different aspects of U.S. development assistance policy, they, along with other U.S. government agencies, work closely to develop and implement a coherent U.S. administration approach to sustainable development. USTR, for example, focuses trade negotiations on win-win approaches to eliminate subsidies and other measures that both negatively affect the environment and distort trade and investment flows. USAID achieves its economic development assistance goals through a number of ways including through partnerships and capacity building. It is the lead agency internationally in the areas of health, gender/women, crisis response and humanitarian assistance. The Treasury Department has the lead for key international financial institutions (IFIs) and multilateral development banks (MDBs), as well as the Global Environment Facility (GEF). In addition to being responsible for coordinating U.S. international development effort and ensuring consistency with broader foreign policy interests, the State Department has the lead on U.S. relations with the United Nations and a number of its specialized agencies (e.g., UNDP, UNAIDS, UNHCR, UNICEF). Under the U.S. Constitution, Congress has the power to authorize and appropriate funding for foreign development assistance (subject to presidential veto). With this authority, Congress exerts considerable influence on U.S. international development policy, particularly through the work of both the Senate and House Foreign Relations Committees (and relevant finance subcommittees). For example, Congress may push to impose sanctions on a particular country, which may in turn significantly limit the development policy options available to an Administration (through, for instance, mandated votes at the multilateral development banks).

Programmes and Projects: U.S. development programs and projects reflect the U.S. Government position that an effective approach to sustainable development must fully incorporate the political, social, economic, and environmental dimensions of the issue. Through its bilateral and multilateral development efforts, the United States has continually emphasized the importance of good governance, the rule of law, strong anti-corruption efforts, broader civil society participation, respect for human rights, and increased investment in people. The current U.S. Administration has called for financial resources to be directed towards increasing productivity in developing countries. For FY 2002, the Administration has requested \$1,210 billion for scheduled annual U.S. commitments to MDBs, a six percent increase over the estimated FY 2001 level of \$1,144 billion. Included in this request is \$107.5 million for the GEF, which provides grants and arranges financing for projects that address environmental management problems with global implications in developing countries. The FY 2002 USAID request includes funding for the Child Survival and Disease Programs Fund (\$1 billion), Development Assistance (\$1.3 billion), the Economic Support Fund (\$2.2 billion), Support for Eastern Europe (\$610 million), Assistance for the Independent States (\$808 million), as well as funding for International Disaster Assistance (\$200 million) and Development Credit programs (\$8 million). The Child Survival and Disease programs cover child and maternal health, HIV/AIDS and other targeted infectious diseases and basic education. The Development Assistance programs address improvements in business, trade and investment and will help expand and strengthen private markets, encourage more rapid and enhanced agricultural development for food security, and provide access to economic opportunity for the rural and urban poor. Environmental programs will continue to reduce the threat of global climate change, conserve biological diversity, provide for sustainable urbanization and pollution control, increase environmentally sound energy services and promote management of natural resources. In 1998, USAID launched

its five-year \$1 billion Climate Change Initiative to carry out the U.S. commitment to reduce the threats posed by climate change in developing and transition nations. Through 44 countries, USAID has helped developing nations to participate in the UN Framework Convention on Climate Change. In addition, USAID plans to dedicate \$329 million for HIV/AIDS to expand prevention efforts, improve community and home-based care and increase support for those sick and dying of AIDS, help AIDS orphans affected by HIV/AIDS, reduce the risk of mother-to-child transmission. Another key aspect funded under this account will be \$110 million for basic education. USAID aims to strengthen pre-primary, primary and secondary education and teacher training. Efforts are focused primarily in Africa, but also include targeted work in Asia and the Near East and Latin America.

Since 1995, the Department of Labor (DOL) has provided more than \$112 million in funding to the International Labor Organization's (ILO's) International Program on the Elimination of Child Labor (IPEC) to support programs aimed at removing children from exploitative work and providing them with education and rehabilitation and their families with viable economic alternatives. In coordination and consultation with USAID, USDOL will fund an additional \$37 million in FY 21001 in programs that provide increased access to quality, basic education in countries with a high incidence of child labor. USDOL will also fund a \$5 million initiative to develop information on the enforcement of labor laws around the world. Since 2000, USDOL has funded some \$40 million in multilateral assistance through the ILO to assist developing countries in implementing core labor standards, basic labor protections, social safety net programs, and programs needed to foster economic growth, and some \$30 million in bilateral technical assistance to increase the capacity of Labor Ministries to implement social safety net programs. Finally, USDOL will fund a \$10 million initiative for an international HIV/AIDS workplace education program. USDOL's FY 2002 budget provides an additional \$45 million for IPEC, \$37 million for bilateral assistance to improve access to basic education in areas with a high incidence of exploitative child labor, \$20 million for multilateral technical assistance, \$17 million for bilateral assistance and \$10 million for HIV/AIDS workplace education.

Status: U.S. trade with developing countries continues to increase. Between 1993/94 and 1999/00, U.S. imports from developing countries (i.e., developing countries sales to the United States) rose 73 percent, or \$118 billion, while U.S. exports to the developing countries (i.e., developing countries' purchases from the United States) gained 34 percent, or \$45 billion. Since 1986, the United States has been the top trading partner for Low and Middle Income Countries. In 2001, the United States shipped 4.4 million metric tons of food aid to developing and transitional countries worth about \$1.6 billion. In 1998 (latest figure available), U.S. FDI in developing countries was valued at \$980.6 billion, up from \$430.5 billion in 1990. The U.S. share of peacekeeping operations in developing countries and countries in transition was \$1.7 billion over the last five years. Total U.S. resources flows to developing countries and multilateral organizations from 1993-2000 is highlighted below:

U.S. Resource Flows to Developing Countries and Multilateral Organizations, 1993-2000
 (all values in million US\$; outflows +, inflows -)
 Updated: December 7, 2001

Flows to Part I - Developing Countries /1/								
Official Development Assistance (ODA), Bilateral + Multilateral								
<i>Bilateral Grants</i>	1993	1994	1995	1996	1997	1998	1999	2000
Program aid	2,101	2,311	1,422	3,244	1,030	1,151	603	962
Technical cooperation	3,310	2,796	2,614	2,787	2,741	3,278	3,877	4,316
Food aid	1,095	1,187	771	420	718	568	1,241	914
Emergency and distress relief	669	1,132	789	585	340	898	1,161	1,165
Debt forgiveness (principal and interest)	667	226	128	0	175	38	68	21
Other /2/	654	649	663	636	629	641	688	716
subtotal	8,496	8,301	6,387	7,672	5,633	6,574	7,638	8,093
<i>Bilateral Loans</i>	1993	1994	1995	1996	1997	1998	1999	2000
Food aid loans, amounts extended	293	146	109	152	153	170	109	100
Other loans, amounts extended	22	27	10	9	7	2	0	0
ODA rescheduling, amounts extended /3/	694	53	0	0	271	9	3	105
Amounts received and offsetting entries /4/	-2,188	-1,243	-892	-916	-1,125	-766	-901	-893
subtotal	-1,179	-1,017	-773	-755	-694	-585	-790	-688
<i>Multilateral grants, capital subscriptions, and lending</i>	1993	1994	1995	1996	1997	1998	1999	2000
Grants to UN agencies	749	852	718	732	739	881	594	809
Food aid through UN	302	283	258	178	253	258	0	433
Grants to other international organizations	227	208	196	266	264	264	343	257
Capital subscriptions (issuances)	1,541	1,312	594	1,300	700	1,441	1,373	1,066
Concessional lending to multilateral agencies, net	-13	-12	-13	-16	-17	-17	-13	-15
subtotal	2,806	2,643	1,753	2,460	1,939	2,798	2,297	2,550
Total ODA, Net	10,123	9,927	7,367	9,377	6,878	8,786	9,145	9,955
Other Official Flows (OOF)								
Export-related transactions, amounts extended	450	715	612	922	1,265	1,339	1,424	1,132
Investment-related and other transactions, amounts extended	518	553	595	636	672	914	5,093	289

amounts extended									
OOF rescheduling, amounts extended /5/	1,760	1,261	2,156	1,590	975	132	65	205	
Amounts received and offsetting entries /4/	-2,588	-1,662	-1,890	-2,030	-2,625	-1,766	-1,788	-1,064	
Total OOF, net	140	867	1,473	1,118	287	618	4,793	562	
Private flows at market terms									
Direct investment abroad, net	20,562	21,407	23,228	23,308	29,962	22,815	22,724	18,456	
Securities and bank credits, net	23,817	19,838	13,404	19,472	36,417	11,344	9,319	-10,724	
Private export credits under guarantee programs, net	-621	4,479	-780	943	2,697	1,543	2,031	3,299	
Multilateral securities, net	1,647	606	-210	-997	-3,768	410	-1,856	-365	
Total Private flows at market terms, net	45,405	46,330	35,642	42,726	65,308	36,112	32,218	10,666	
Grants by nongovernmental organizations (NGOs)									
Total Grants by NGOs, net	2,567	2,614	2,502	2,509	2,518	2,671	3,981	4,069	
TOTAL FLOWS TO PART I	58,235	59,738	46,984	55,730	74,991	48,187	50,138	25,252	

FLOWS TO PART II - DEVELOPING COUNTRIES IN TRANSITION /1/									
	1993	1994	1995	1996	1997	1998	1999	2000	
Official aid, net /6/	1,647	2,422	1,280	1,694	2,516	2,726	3,521	2,506	
Other official flows, net	1,071	87	-8	-24	5	-20	-96	824.99	
Private flows at market terms, net	825	146	1,720	2,939	14,740	10,409	16,221	17,105	
Grants by nongovernmental organizations, net	308	294	297	295	1,047	1,438	2,121	2,362	
TOTAL FLOWS TO PART II	3,851	2,949	3,289	4,904	18,308	14,553	21,767	22,798	
Addenda:									
U.S. GNP at current prices /7/	6,372,30	6,744,40	7,070,40	7,446,50	7,853,10	8,490,50	9,297,90	9,928,50	
ODA as a percentage of GNP (percent) /7/	0.16	0.15	0.1	0.13	0.09	0.10	0.10	0.10	
Total flows to Part I countries as a percentage of GNP (percent) /7/	0.91	0.89	0.66	0.75	0.95	0.57	0.54	0.25	

Notes:

1. Flows are net disbursements to Part I and Part II developing countries (includes development-oriented multilateral organizations) on the list of aid recipients as designated by the Development Assistance Committee of the Organization for Economic Co-operation and Development.
 2. Includes primarily administrative costs of agencies dedicated to foreign assistance.
 3. Includes new loans to retire outstanding credits and capitalize interest.
 4. Includes credit repayments, retirement of existing loans with proceeds from rescheduling, and offsetting entries related to debt forgiveness (principal only).
 5. Includes new loans to retire outstanding credits, capitalize interest, and convert defaulted credits of foreign borrowers under U.S. Government loan guarantee programs into long-term credits.
 6. Official flows to Part II countries that have the same concessional and qualitative features as ODA are designated official aid. Only flows to Part I countries are eligible to be recorded as ODA.
 7. GNP entries are standardized System of National Accounts data. Beginning in 2000, Gross National Income (GNI) replaces GNP as the reference measure for overall economic activity of donor countries.
- Footnote A: In 1996, the Bahamas, Brunei, Kuwait, Qatar, Singapore, and the United Arab Emirates were reclassified from Part I to Part II status. In 1997, Bermuda, Cayman Islands, Cyprus, Falkland Islands, Hong Kong, Israel, and Taiwan were reclassified from Part I to Part II status, and Moldova shifted from Part II to Part I status. In 2000, Aruba, French Polynesia, Gibraltar, Republic of Korea, Libya, Macao, Netherlands Antilles, New Caledonia, Northern Marianas, and the Virgin Islands (UK) shifted from Part I to Part II status.
- Footnote B: These figures exclude some technical assistance resource flows made available through USG agencies, e.g., the Department of Labor.

Source: SAID/PPC/DP

GNP = Gross National Product

Capacity-Building, Education, Training and Awareness-Raising: The United States has matched recent efforts to reform its domestic education system with international leadership to expand educational opportunity in developing countries, most recently within the context of the Genoa G-8 Summit. Along with its G-8 partners, the United States remains committed to helping developing countries meet the Dakar goals, including: ensuring that by 2015 all children have access to and complete a primary education of good quality; eliminating gender disparities in primary and secondary education by 2005; and improving learning achievement in basic education. To this end, U.S. international efforts to improve education focus on three areas: enhancing resources for basic education; increasing accountability for educational results; and teacher training. The United States has also proposed an international school lunch program, called Global Food for Education (GFFE), to help keep children in poor countries in school during economic downturns. The United States has already committed \$300 million for a pilot program. The United States is also active in technical training and innovative approaches to education through the work of its Trade and Development Agency (TDA). TDA has assisted private sector efforts to use information technologies and advanced telecommunications to bring distance learning, such as the Africa Virtual University, to areas lacking the infrastructure for “brick-and-mortar” schools.

Information: No information available.

Research and Technologies: No information available.

Cooperation: The United States participates actively in numerous international assistance coordination groups, including the Organization for Economic Cooperation and Development's Development Assistance Committee, World Bank Consultative Groups, Special Program of Assistance to Africa, UNDP Round Tables, Paris Club, the boards of MDBs, and the G-8 process. In addition, the United States is active in the Japan-U.S. Common Agenda

and the new Transatlantic Agenda, two key international aid-coordinating fora. In 2000, the United States provided \$10.0 billion of official development assistance, a 9% increase compared with 1999. As part of debt relief agreements reached in the Paris Club, there have been a variety of U.S. bilateral debt reduction programs through the years. Over the last decade the United States forgave \$2.7 billion in concessional USAID and P.L.-480 (“Food for Peace”) debt owed by a total of 25 “relatively least developed countries.” In 1996, the Heavily Indebted Poor Countries (HIPC) program was established to address the debt problems in a comprehensive fashion of many heavily indebted developing countries. In 1999, under strong U.S. leadership, the enhanced HIPC initiative was launched to provide deeper, broader and faster debt reduction for the poor heavily indebted countries committed to economic reform and poverty reduction. Private flows have emerged as the key part of total financial flows to developing countries in the 1990's. In the 1960's, official development assistance accounted for over 70% of total U.S. resource transfers, while in the 1990's, private flows accounted for nearly 80% of total U.S. transfers. While the United States had the lowest official development assistance (ODA) ratio (0.64%), it was in the middle range of donors. The United States continues to take a comprehensive approach to leverage developing countries' own capacities via: 1) strong trade and investment ties; 2) grant-based technical assistance used to advance policy reform, governance, institution building, entrepreneurship and investments in people; 3) humanitarian food aid; 4) peace-keeping efforts; and 5) substantial private philanthropy.

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CHAPTER 35: SCIENCE FOR SUSTAINABLE DEVELOPMENT

Advancing Knowledge: The goal of sustainable development demands new knowledge, which science and technology will provide. Scientific and technological research and innovation are key to increasing mankind's abilities across a spectrum of uses of knowledge: understanding a phenomenon and its causes; assessing impact, magnitude, time scale, probability; predicting trends and the effects of taking specific actions; developing and testing solutions; preventing predictable outcomes and mitigating harm; and making informed policy decisions. The pursuit of scientific and technological knowledge is an ongoing process; the knowledge base must be constantly renewed and replenished. The biological and physical sciences and engineering must work closely with the social and behavioral sciences to speed the application of innovations and insights to the needs of society. In the United States, government and non-government organizations are advancing more integrated approaches to science for sustainable development. Within the Federal government, several offices play a key role in formulating and promoting science policies that relate to sustainable development policymaking for the United States. They include the National Science and Technology Council (NSTC), the Office of Science and Technology Policy (OSTP) the Office of Technology Policy (OTP) and the Council on Environmental Quality (CEQ). Working together with major Congressional committees, these offices help set priorities for funding, program oversight and policy leadership regarding the scientific priorities and technical approaches towards sustainable development in the United States.

The National Science and Technology Council (NSTC) were established in 1993 to guide and sustain how research and development is conducted in the United States. This cabinet-level council is the principal means for the President to coordinate science, space and technology policies across the entire Federal Government. It is chaired by the President, and composed of the Vice President, Cabinet Secretaries and Agency Heads with significant S&T responsibilities. The NSTC ensures that those departments and agencies work cooperatively to ensure that Federal science and technology investments, including the preparation of R&D strategies, in attaining national goals. The Office of Science and Technology Policy (OSTP) was created in 1976 and has responsibility for advising the President on policy formulation and budget development on all national S&T programs, setting national S&T priorities and fostering partnerships between all levels of government, the scientific community, the private sector and academia. OSTP's Director also serves as the President's Science Advisor and manages the NSTC agenda as required. The Office of Technology Policy (OTP) is part of the Technology Administration (TA) of the U.S. Department of Commerce. TA is the pre-eminent portal to the federal government for the U.S. technology industry, and a primary advocate on behalf of U.S. technology in the federal policy-making process. As gatekeeper to this portal, OTP is the only office in the federal government with the explicit mission of developing and advocating national policies and initiatives that use technology to build America's economic strength. Working in partnership with the private sector to achieve this objective, OTP's goals also include the creation of high-wage jobs and improvements in our quality of life. OTP is currently pursuing several key initiatives including:

- The National Medal of Technology program, the highest honor awarded by the President of the United States for technological innovation;
- The Office of Technology Competitiveness, which works to promote domestic technological competitiveness in four interrelated policy areas: technology development and transfer, business innovation, state and local efforts to promote technology based economic growth, and work force preparation for a technology driven future; and
- The Office of International Technology, which promotes international technology partnerships that strengthen U.S. competitiveness, and advocates policies that advance U.S. leadership in the global economy. The office manages activities in the Middle East, Asia-Pacific, and Europe, including Russia.

In addition, the Technology Administration leads the Partnership for a New Generation of Vehicles (PNGV), a public/private partnership between the U.S. federal government (including 7 agencies and 19 federal laboratories) and DaimlerChrysler, Ford and General Motors that aims to strengthen America's competitiveness by developing technologies for a new generation of vehicles. PNGV's long-term goal is to develop an environmentally friendly

car with up to triple the fuel efficiency of today’s midsize cars—without sacrificing affordability, performance or safety.

Through technology and scientific insights, government agencies make important strides in understanding and predicting the behavior of natural systems, in managing resources more effectively, and in improving environmental quality, all of which contribute to sustainable development. For instance, the National Oceanic and Atmospheric Administration (NOAA), by utilizing its world renowned and respected scientific capabilities, forecasts U.S. weather and climate, monitors and archives ocean and atmospheric data, manages marine fisheries and mammals, and conducts cutting-edge oceanic atmospheric and solar research. NOAA observes environmental conditions in locations ranging from outer space to the ocean bottom, and places a high priority on the continuity of observations. Observations are made from instrumented platforms such as satellites, aircraft, ships, buoys, and submersibles. Observing networks include radars, radiosonde stations, tide gauges, water-level stations, volunteer weather observers, and numerous other systems.”

In addition, several Federal agencies have research responsibilities that are essential for approaching science in ways that integrate social, economic, and environmental questions. For instance, within USDA, the Research, Education, and Economics (REE) mission area is assigned Federal leadership responsibility for the creation and dissemination of knowledge spanning the biological, physical, and social sciences related to agricultural research, economic analysis, statistics, Extension, and higher education. Through its programs, REE enhances the U.S. position as a global leader in a highly competitive food and fiber system; promotes sustainable agricultural practices in harmony with the environment; and contributes to continued agricultural prosperity, thriving rural communities, and well-informed consumers. And within USDA’s Natural Resources and Environment (NRE) mission area, the Forest Service is charged with doing research and development to sustain the health, productivity, and diversity of the nation’s forests and rangelands to meet the needs of present and future generations. Increasingly, USDA research programs are to be developed to understand, characterize, and lead to management practices that interrelate soil, water, weather, and other natural elements of production with the genetic resource base, chemicals, farming and forestry practices, markets for food and fiber, and related community development. Leadership for science and decision-making also is being provided by the private sector. For example, in 1990, the National Council for Science and the Environment (NCSE) was founded as a not-for-profit corporation to improve the scientific basis for environmental decision-making. Thousands of scientists, educators, elected officials, and other environmental, business, and civic leaders helped develop the core principles; and today is supported by more than 500 organizations. It promotes a cross-cutting approach to environmental science that integrates interdisciplinary research; scientific assessment; communication of science-based information; and environmental education. More information about the NCSE is available on the Internet (<http://www.cnie.org>).

Programmes and Projects: In 1999, the National Academies of Science (NAS) in conjunction with the expertise supplied by government, private industry, universities and scientific societies published its seminal study entitled, *“Our Common Journey: A Transition Towards Sustainability.”* That study provided a comprehensive assessment of the issues, threats, opportunities, challenges, strategies and alternative frameworks for accomplishing the tasks associated with sustainable development. In 1998, the U.S. interagency working group on sustainable development published its unique study of over 40 experimental social, economic and environmental indicators to guide the development of national sustainable development policies and structure a long-term framework for accomplishing that goal entitled *“Sustainable Development in the United States: An Experimental Set of Indicators”*.

Geographic Information Systems: The past decade has seen a significant improvement in earth observation data and information management systems that can help address those issues at global, national, regional, and local levels. A key challenge for the international community during the next decade is to make geographic information more accessible and useful to decision makers working on sustainable development problems, especially in poor regions such as Africa. Over the past decade, the public and private sectors have successfully collaborated in

- The collection of earth observation data (from LandSat to IKONOS);

- The technologies that allow such data to be accurately geo-referenced (global positioning system [GPS]), organized, and displayed (geographic information system [GIS]); and
- The telecommunications media that allow such data to be broadly and quickly
- Disseminated locally and internationally via the Internet.

Scientists around the world have undertaken pioneering work in applying these data and technologies to a wide range of pressing natural resource management problems – from forest fire prevention to soil conservation. The United States is committed to working with The United Nations (UN), other governments, non-governmental organizations (NGOs), and the private sector on developing the decision making tools and earth science-based information needed by local and national resource managers to make environmentally and economically sound decisions. A priority is sustainable agricultural production to feed a growing world population.

The *Initiative for Future Agriculture and Food Systems* (IFAFS), legislated by Congress, authorized the Secretary of Agriculture to establish a research, extension and education competitive grants program to address a number of critical emerging agricultural issues. These issues related to future food production, food safety, environmental quality, natural resource management, and farm income. Priority program areas were established to address these emerging issues: 1) agricultural genome; 2) food safety, food technology, and human nutrition; 3) new and alternative uses and production of agricultural commodities and products; 4) agricultural biotechnology; 5) natural resource management, including precision agriculture; and 6) farm efficiency and profitability, including the viability and competitiveness of small- and medium-sized dairy, livestock, crop and other commodity operations. Priority for funding is for those proposals that were multi-State, multi-institutional, or multi-disciplinary, or that integrate agricultural research, extension, and/or education. Examples of specific programs follow:

- The National Integrated Pest Management (IPM) Program, administered by USDA provides competitive research and extension grants focused on the development and implementation of IPM methods that address the most pressing needs of farmers, consultants, commodity groups and other end-users. Projects proceed from user identification of priority research and education needs, to the development of science-based solutions and full implementation by the private sector.
- Research in the Watershed Processes and Water Resources Program of USDA's National Research Initiative is aimed at understanding the processes that influence water quantity and quality in natural and managed watersheds. The goal is the development of appropriate technology and management practices for improving the effective use of water (consumptive and non-consumptive) and protecting or improving water quality for agricultural and forestry production, including the evaluation of management policies that affect the quantity and quality of water resources.
- Forest-related research and development, administered by the USDA Forest Service (FS), includes both basic and applied research; and many research programs are being integrated with research done by other agencies and organizations as well as with other programs of the FS aimed at improving forest management practices, use, and related development. For instance, watershed responses have been studied for more than 60 years in the Coweeta Hydrologic Laboratory in North Carolina; and now it is one of eleven Long-Term Ecological Research sites selected by the National Science Foundation. The work of the Forest Products Laboratory described in Chapter 11 provides several more examples.
- The Small Business Innovation Research (SBIR) program allows USDA to make competitively awarded grants to qualified small businesses for the purpose of supporting high quality research proposals containing advanced concepts related to important scientific problems and opportunities in agriculture that could lead to significant public benefit if the research is successful. Objectives of the SBIR Program are to stimulate technological innovations in the private sector, strengthen the role of small businesses in meeting Federal research and development needs, increase private sector commercialization of innovations derived from USDA-supported research and development efforts, and foster and encourage participation by

women-owned and socially and economically disadvantaged small business firms in technological innovations.

The *Global Seismographic Network* (GSN) is a worldwide network currently consisting of 120 modern seismographic stations. The U.S. Geological Survey (USGS) is responsible for maintaining two-thirds of the stations in GSN. The GSN has a goal of 128 stations providing high-quality data used to address problems related to disaster management, hazards assessment, national security, loss reduction, and the structure and dynamics of the earth. GSN is a joint effort involving the USGS, the Incorporated Research Institutions for Seismology (IRIS, a consortium of universities supported by the National Science Foundation), and the Institute for Geophysics And Planetary Physics (IGPP) at the University of California. The network is maintained in cooperation with many international partners who, in most cases, provide facilities to house the instruments and personnel to oversee the security of each station. The majority of GSN stations are operated within the framework of agreements between a host organization (academic institution or foreign government agency) and either the USGS, IRIS, or IGPP. Data from the GSN continue to be used extensively in basic and applied research on earthquakes, earth structure, and seismic monitoring. Research efforts using GSN data that have received recent attention include: the structure and symmetry of the Earth's inner core, the three-dimensional structure of the Earth's mantle, and the structure and seismic properties of the Earth's crust and upper mantle in central Asia, the Middle East, and northern Africa. The latter studies have application in enhancing the ability of the United States to monitor possible nuclear tests in those regions.

Land Surface Description and Analysis: USGS scientists describe, document, and map the status of and changes on the land surface resulting from natural and human forces and investigate the causes and consequences resulting from the interplay of these forces in modifying the land surface. As agents of landscape change, human-induced land transformations are accelerating and increasing stress on the landscape. USGS scientists are analyzing the rates, patterns, and trends of land surface change to help understand its role in ground water quality, withdrawal, and recharge; habitat fragmentation; vector-borne disease propagation; invasive species introduction; natural resource accessibility; and natural hazard susceptibility and vulnerability.

- *Land Use Dynamics* – The USGS documents and analyzes the geographic variability in the land surface at local, regional, national, and global scales using state-of-the-art remotely sensed and other geographic data. Investigations are conducted to understand, in part, (1) human modification of the land surface; (2) how modifications affect wildfire hazards; (3) the types of land cover that are most dynamic; (4) the relationship between land cover change and environmental factors such as the health and distribution of various biologic species, natural resource availability, and climate and weather; and (5) the potential impact of future changes in regional rates of land cover change. Scientists can better understand and model land processes, land-atmosphere interactions, and the impacts of landscape change that result from natural and human causes by developing and analyzing complex land cover data.
- *Land Cover Trends:* Research activities examine the contemporary rates, causes, and consequences of land use and land cover change that have occurred over the past 30 years in order to provide sound information for effective land management. Studies use historical satellite imagery to sample, measure, and analyze changes that occurred in the conterminous United States using a sampling framework based on ecoregions. Metrics for measuring landscape change and data analysis standards will be developed to improve the ability to conduct nationally consistent assessments and comparisons between regions.
- *Biological Research and Monitoring – GAP Analysis:* Gap analysis is a scientific method of identifying the degree to which native animal and plant species are represented in our present day mix of conservation lands (those species not adequately represented constitute conservation “gaps”). The Gap Analysis Program (GAP) provides broad geographic information on the status of species and their habitats. Research and development dominated the GAP program through its first decade, resulting in

groundbreaking, technical methodologies and standards for conducting projects nationwide. Stemming from those methods, the program has been aggressively developing State partnerships and performing GAP projects nationwide. Recent innovations expanding the application of GAP include decision-support prototypes for determining the impacts of development on biodiversity and providing assessments of key habitats associated with National Wildlife Refuges. In addition, digital databases describing statewide land cover assemblages, vertebrate distributions, and characterizations of land stewardship have been created for most of the country.

- *Water Resources* - The U. S. Geological Survey (USGS) has the principal responsibility within the United States to provide the hydrologic information and understanding needed by others to achieve the best use and management of the Nation's water resources. To accomplish this, USGS
 - Systematically collects and analyzes data to evaluate the quantity, quality, and use of the Nation's water resources and provides results of these investigations to the public.
 - Conducts water-resources appraisals describing the occurrence, availability, and physical, chemical, and biological characteristics of surface and ground water.
 - Conducts basic and problem-oriented hydrologic and related research that aids in alleviating water resources problems and provides an understanding of hydrologic systems sufficient to predict their response to natural or human-caused stress.
 - Coordinates the activities of Federal agencies in the acquisition of water resources data for streams, lakes, reservoirs, estuaries, and ground water.

As the U.S. government agency charged with promoting the progress of science, the National Science Foundation (NSF) is a primary funding source for basic research at U.S. universities. NSF has played a major role in supporting the fundamental science and engineering to empower people, expand intellectual capital, and improve the tools they use. Basic research supported by NSF generates scientific information and enabling technologies for understanding sustainability issues and provides methods for solving problems in global change, biodiversity, food supply, health care, water resources, energy conservation, pollution control, hazards prediction and mitigation, to name just a few. The following are just a few selected examples of NSF research funding programs related to the theme of sustainable development. Many more fields could be included.

- *Biocomplexity in the Environment*: A priority area for NSF, the Biocomplexity in the Environment (BE) program, first funded in 1999, is a multi-year investment to foster research and education on the complex inter-dependencies among the elements of specific environmental systems and interactions of different types of systems. All kinds of organisms—from microbes to humans—fall within the BE framework, as do environments that range from frozen polar regions and volcanic vents to temperate forests and agricultural lands as well as the neighborhoods and industries of urban centers. The program encourages collaborations across a broad spectrum of fields--biology, physics, chemistry, hydrology, geology, statistics, engineering, computation, and social sciences.
- *Plant Genome Research*: NSF in FY 1998 initiated *The Plant Genome Research Program*. The long-term goal of this program is to understand the structure, organization and function of plant genomes important to agriculture, the environment, energy and health. Emphasis is placed on plants of economic importance and plant processes of potential economic value. This program builds on the work of the Multinational Coordinated *Arabidopsis thaliana* Genome Research Project, an international scientific collaboration begun in 1990 that completed the sequencing of the *Arabidopsis* genome by the target date of 2000. The *Arabidopsis* genome project is the world's leading source of new information on key aspects of plant growth, development, and metabolism.

- *NSF-EPA Partnership*: NSF and EPA support extramural grant programs in fundamental research on the environment. Since establishing a formal partnership in 1994 the two agencies have held joint award competitions annually in a number of areas, including: Decision-Making and Valuation for Environmental Policy, Environmental Statistics, Technology for a Sustainable Environment, and Water and Watersheds.

Many other programs and projects are supported by the private sector, often in partnership with government agencies. For instance, the National Council for Science and the Environment convened and manages a new National Commission for Science on Sustainable Forestry sponsored by the Doris Duke Charitable Foundation, Rockefeller Brothers Fund, and Surdna Foundation. The Commission seeks to develop and conduct a research program to build a better scientific underpinning for assessing forest management practices; and is initially focusing on the relationships between biodiversity and forest management practices. More information about its mission, structure, members, and programs is available on the Commission's web site (<http://ncssf.org>).

Capacity-Building, Education, Training and Awareness-Raising: While the entire scope and variety of federal agency programs related to capacity-building cannot be described adequately or summarized in this limited space, the examples cited below illustrate typical project focus and principal activities. *Developing Young Scientists (NIH)*: The Department of Health and Human Services through the National Institutes of Health (NIH) forges collaborations with a range of domestic and international partners to build capacity for international research and training in health to enhance sustainable development. NIH expenditures for international activities in 1999 were \$272 million. The objectives are: to accelerate the pace of discovery and its application by enabling scientists worldwide to share conceptual insights, analytic methods, data sets, patient cohorts or special environments; to engage and assist both young and established U.S. scientists to address scientific challenges related to global health; and to help develop a cadre of highly capable young foreign scientists positioned to cooperate with U.S. scientists in areas of the world that, due to geography, population structure, or disease burdens, provide unique opportunities to understand disease pathogenesis, anticipate disease trends, or develop interventions. *Regional Institutes For Global Change Research (NSF)*: The Inter-American Institute for Global Change Research is one of three regional institutes for global change research that were created to facilitate the integration of global change research programs on a regional basis. (The others are: European Network for Research on Global Change and Asia-Pacific Network for Global Change Research.) The Inter-American Institute for Global Change Research (IAI) was designed to facilitate the flow of scientific resources and data across borders for the benefit of all participants, and ultimately to enrich the information available to policymakers in all member countries to assist in the formulation of policies related to global change.

The SysTem for Analysis, Research, and Training (START) (NSF): The START program aims to develop a system of regional networks of collaborating scientists and institutions that will conduct research on regional aspects of global change; assess the causes and impacts of that change; provide relevant information to policy makers and governments; enhance the scientific capacity in developing countries by strengthening and connecting existing institutions by training global change scientists and by providing them with improved and enhanced access to data, communication technology and research results. The International Human Dimensions Program, International Geosphere-Biosphere Program and the World Climate Research Program are joint sponsors of START.

Global Seismographic Network Establishes Internet Connection to Equatorial Africa (NSF): University students in equatorial Africa are now able to access high-speed Internet service for the first time, thanks to a collaboration between a university in Africa and the Global Seismographic Network (GSN), funded by NSF and run by the Incorporated Research Institutions for Seismology (IRIS). IRIS scientists worked with officials in Gabon, Africa, to gain access to seismic data from a newly installed GSN station near Franceville, Gabon. With the help of the President of Gabon, the Universite des Sciences et Techniques de Masuku cost-shared a satellite link for telemetering seismic data. Seismic data from this remote region is now flowing to U.S. scientists, and the first Internet access is available to the university and its medical research center.

National Sea Grant College Program (NOAA): Sea Grant engages the nation's top universities in conducting scientific research, education and extension projects designed to help better understand and use the oceans, coastal

and Great Lakes' resources. By employing the expertise and skills of the network's universities, research institutions and programs, Sea Grant activities promote sustainable development by creating new products and services, enhancing coastal and marine resource management, reducing the loss of life and property, and educating tens of thousands of K-12 and university students. Sea Grant is working with international partners to develop and promote sustainable aquaculture practices. The U.S.-Japan Cooperative Program in Natural Resources Aquaculture Panel, the U.S.-China Living Marine Resources Aquaculture Panel, and the U.S.-Korea Aquaculture Panel facilitate the exchange of aquaculture information and expertise. Current priority areas of collaboration include the development of technologies for sustainable stock production, the use of aquatic plants and animals for pollution prevention, the holistic management of ecosystems to improve environmental conditions and studies of aquatic animal health.

Information: In keeping with the principle that policymakers and the public ought to enjoy maximum access to key information, studies, and databases that reflect the ongoing and recent achievements attributable to science and technology, the United States actively fosters an open environment of data sharing. This involves balancing the public's right to know with other key considerations, such as privacy, and commercial and proprietary interests. The challenge remains in identifying the appropriate databases and information technologies, which are available for scientists, policymakers and the public in furthering our national sustainable development actions. As one example, the results of all research funded by NSF are published in the open literature. Moreover, through NSF's Website, <www.nsf.gov> anyone can access and download the abstracts of any or all of the awards funded by NSF.

Global Land Cover Characterization. The USGS Land Cover Characterization Program provides scientific data and technical support to scientists and users of land-cover data. This valuable land-cover data combines a variety of supporting information in addition to the satellite data, including topography, census, agricultural statistics, soil characteristics, other land-cover maps, and wetlands data. By integrating these data, USGS scientists determine and label the land-cover type for each 30-meter pixel and provide the information to users. The program also has the responsibility to maintain user databases for the Global and National land-cover datasets. Global data user applications include: natural resource management efforts, global change, atmospheric and climate studies, and classroom education. Users of the National Land Cover Dataset include Federal agencies (EPA, USGS/Water Resources Program, Forest Service, Federal Emergency Management Agency, etc.), State mapping agencies, universities, scientific non-governmental organizations, and private contractors. Their applications include land-cover change studies, watershed and water quality studies, urban sprawl, wildlife habitat, insect disease vectors, hurricane and earthquake risk analysis, and the effects of land cover on wireless telecommunication. The *USGS Urban Dynamics Program* provided historical perspectives of urban land-use change and an assessment of that change for select metropolitan areas around the country. Methods for land use reconstruction were developed and refined. Geographic analysis and modelling was conducted to understand the change in urban areas over time and forecast change metropolitan regions in the mid-Atlantic and Pacific Northwest. Change pairs for 50 metropolitan areas were developed to reveal change in developed lands between the 1970's and 1990's.

Research and Technologies: From among the many cooperative programs sponsored by the U.S. government, an example of activities in this area features NIH Research and Technologies. Increased awareness of the role of human health in contributing to improved quality of life and economic productivity highlights the integrated nature of sustainable development. In addition to environmental research, the U.S. Government extensively supports biomedical research to improve public health, both domestically and internationally. A total of \$16 billion in 2000 was allocated to biomedical research through the National Institutes of Health, with approximately \$400 million devoted to research in environmental health. Basic and applied research undertaken through this funding leads to greater knowledge and awareness about health and disease, along with the discovery of tools and technologies to improve people's lives through better health. The United States actively seeks to transfer the discovery derived from this research into better technologies for human health within its borders and to meet the health needs of the global population.

Financing: Diverse mechanisms exist for funding cooperative science activities and related sustainable development projects. These include direct agency grants to scientists; bilateral science research funds; multilateral science and technology development funds; direct assistance and designated aid to countries for science-related projects, bilateral cooperative arrangements where both parties contribute resources or facilities in-kind, and the creation of public-private partnerships where relevant and practicable.

Cooperation: Numerous cooperative programs and projects sponsored by a variety of federal agencies provide both direct and indirect contributions to the aims of sustainable development. One type of cooperation is international scientific fellowships, which lead to information-sharing and enhanced understanding among scientists across the world. They provide opportunities to conduct research in diverse settings and compare findings to those from familiar settings and conditions. The United States engages in numerous international scientific exchanges and sponsors fellowships for foreign scientists. An example from NIH on international scientific fellowships is illustrative of many others that further specific sustainable development goals or demonstrate a direct relationship with sustainable development activities. The NIH Visiting Program provides opportunities for foreign scientists to train and conduct collaborative research. Each year, more than 2,000 scientists from other nations conduct research in the basic and clinical science laboratories on the NIH campus in Bethesda, Maryland, and in several field units around the country. The NSF supports international activities widely distributed across the continents and oceans of the world and that range from work in the world's most advanced science and engineering laboratories to observation of physical, biological, and human processes around the globe, including its polar regions. A dynamic global economy, growing investments of other countries in their research and education enterprises, the evolving international framework of science and engineering institutions, the opportunities presented by new global communication technologies, and shifting world-wide demands on human and financial resources for research and education all have implications for U.S. scientific and engineering research and education.

The Foundation stands firmly behind the principle of open and reciprocal access to research and education facilities and programs by U.S. researchers and students and those of foreign countries. By and large, the Foundation encourages the U.S. scientists and engineers it supports to make their own arrangements abroad. These arrangements are made on an ad hoc basis or within the framework of university, center, or laboratory agreements with foreign partners.

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CHAPTER 36: PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING

Decision-Making: Education, training and public awareness for sustainability is the responsibility of all levels of government to prepare citizens with the creative problem solving skills, scientific and social literacy and commitment to engage in responsible individual and cooperative actions. Agenda 21 states that “education is critical for promoting sustainable development,”--part of the infrastructure needed to set us on the path of a sustainable world. Understanding the principles of sustainability and the interdependence of the environment, the economy, and social systems can help us learn to make the changes necessary to become effective stewards of natural resources and the environment. Formal education in the United States is primarily a state and local responsibility. It is states and communities, public and private organizations that establish primary and secondary schools as well as colleges and universities, develop curriculum and determine the requirements for enrollment and graduation. Each state and territory is internally self-governing and has equal authority with respect to educational matters within its jurisdiction, with educational policy and oversight of states’ school districts in the hands of state boards of education. A school board made up of elected and/or appointed officials governs local school districts. There is no standard national curriculum set by law.

The role of the federal government is to ensure equal access to education and to promote educational excellence throughout the United States. The U. S. Department of Education is the agency responsible for federal education policy, although numerous federal agencies contribute resources to education-related programs and activities. The Department is responsible for collecting and disseminating information such as educational statistics, research data and best practices; building partnerships with states, communities, educators, parents, and the private sector to improve education; ensuring equal educational opportunities by enforcing civil rights laws; supporting educational improvement and reform by providing grants to states, local government and individual schools (often targeted to disadvantaged groups); and providing financial assistance to students to help pay for postsecondary education.

Educators and public officials generally agree that significant improvements are needed in the nation’s formal public education system in order to enhance student learning including: research-based methods of instruction; accountability for student outcomes; standards-based curriculum; emphasis on higher-order thinking skills; links to the real world; and integration of knowledge and action skills across disciplines. The goals of the current national education reform movement focused on improving student performance emphasize the importance of strengthening core subjects such as reading, math, science and geography. The use of the environment in formal education and in informal settings such as nature centers, national parks and forests and zoos is a remarkably effective means to support national education goals because of the interdisciplinary nature of environmental education and because environmental topics can be addressed from many different perspectives including scientific, historical, cultural and political perspectives. Environmental education and training bridges the gap between the public’s awareness of and interest in protecting human health and the environment and their need to become more knowledgeable about the complexities of environmental protection and sustainable development.

Informal education in the United States is a large infrastructure of learning opportunities offered by youth serving organizations, nature centers, national forests, parks and zoos, home-schooling, and the private sector in the form of certifications and continuing education. These experientially based learning opportunities offer connections with the real world interactions between and among economic, social and environmental issues using the community environment as a laboratory. The role of the federal government in informal education is to ensure accessibility to federally provide educational opportunities, and to ensure that information and education addresses issues of importance to the public served, is based in fact, and addresses issues in a balanced manner.

EPA, authorized by the National Environmental Education Act, provides leadership and financial support to help educate the public about complex environmental issues. EPA’s Office of Environmental Education (OEE) has an important role in strengthening environmental education nationally and is responsible for coordinating environmental education activities in the Federal government. OEE works with a large variety of governmental and non-governmental organizations including the U. S. Departments of Agriculture, Education and Interior, the National Science Foundation and the North American Association for Environmental Education, to improve the

quality and access of environmental education to students, educators and the general public and to identify, promote and support effective programs, education research and public information about environment-based programs. Many of these programs are locally developed and focused covering such topics as human and wildlife interactions, land and water stewardship, human use of natural resources, and the relationship between cultures and the environment. Federal resources used for these programs are often matched and many times exceeded by contributions from other public and private organizations that partner with the federal agencies to deliver these programs.

The National Environmental Education Advisory Council is a consultative body for EPA composed of representatives of primary and secondary education, state departments of education and natural resources, colleges and universities, business and industry and NGOs. The Council provides the Administrator of EPA with independent advice on how the Agency implements the National Environmental Education Act. The Council serves as an important communication mechanism, which links the federal government with educators around the country. The Council has produced two reports to Congress describing the status of environmental education in the United States and providing recommendation for strengthening environmental education at the national, state, local and tribal levels. In addition, EPA convenes an interagency task force to coordinate environmental education activities within the Federal government through interagency agreements and partnership efforts.

Programmes and Projects: There are many examples of national environmental education programs targeted to students in formal education settings at the primary, secondary and university levels, as well as in informal settings such as museums, national parks and forests and zoos and aquaria. There are in-service programs available for education professionals through local, state, tribal and Federal government agencies, NGOs, non-profit education and professional associations, and the academic community. Educator training takes place in both formal and non-formal settings. Many programs are a result of cooperative efforts between federal agencies, non-profit organizations and universities. Federal agencies support a variety of programs that advance the field of environmental education and sustainable development education including:

- Environmental Education and Training Partnership (EETAP)—a teacher training program supported by EPA designed to deliver scientifically sound and educationally appropriate training and support services on environmental issues to teachers and other education professionals. EETAP is a consortium of 14 leading education and environmental education organizations working to advance education and environmental literacy; conducting a variety of activities designed to support the capacity of educators to teach about the environment using sound methods and quality resources. Information about the Environmental Education and Training Partnership (EETAP) can be found at www.eetap.org.
- EPA’s National Environmental Education Grant Program is designed to provide schools, colleges and universities, non-profit organizations and state, local and tribal agencies with funds to support environmental education projects that enhance the public’s awareness, knowledge, and skills to make informed decisions that affect environmental quality.
- The U. S. Department of Agriculture’s Sustainable Community Innovation Grants Program offers grants to state university extension services to focus on community sustainable development in cooperation with the Cooperative State Research Education and Extension Service (CSREES) Sustainable Research and Education Program. Information on CSREES can be found at www.reeusda.gov
- Global Learning and Observation (GLOBE) Program is a large-scale, K-12 program that provides teachers in participating schools with structure and resources for using the Internet in environmental science instruction. Students in 60 countries collect environmental data at or near their schools and publish their findings on GLOBE’s Internet site. An international team of environmental scientists provides quality

control checks on the data, processes the information and communicates findings back to the students via the Internet. Information on the GLOBE Program can be found at www.globe.gov/.

- Hands-on-the-Land is supported by the Partners in Resource Education, a formal partnership of federal natural resource agencies including: U. S. Departments of Agriculture and Interior, the Forest Service, the Natural Resource Conservation Service, the Bureau of Land Management, the National Park Service and the Fish and Wildlife Service, as well as EPA. The program is designed to provide a national network of field classrooms to enhance K-12 student learning by linking the nation's schools to public lands.
- The Sustainable Development Extension Network is comprised of federal agencies and NGO's including the U. S. Department of Agriculture Extension Service, the Small Business Administration and the American Planning Association. The Network focuses resources for federally funded education and extension service programs at the state, county and local levels to assist communities to include environment and equity considerations in their economic and community development planning. Information on the U. S. Department of Education Sustainable Development Programs can be found at www.usda.gov/sustainable.
- Biodiversity Education Network is an organization supported by the U. S. Department of Interior–Fish and Wildlife Service and EPA designed to look at the field of biodiversity education to define the needs of the needs of the field nationally and to develop strategies and programs to address the gaps in biodiversity education.
- Global Rivers Environmental Education Network (GREEN) promotes an action-oriented approach to education based on an interdisciplinary watershed education model. GREEN's mission is to improve education through a global network that encourages watershed sustainability using the Internet to meet that goal. Information about GREEN can be found at www.green.org.
- Education for a Sustainable Future is funded by the U S. Department of Education's Technology Innovation Challenge Grant Program (see Financing, below) and designed to develop and disseminate technology-rich educational materials software and on-line courses on topics related to sustainable development for educators and students. Information on the Technology Innovation Challenge Grant Program can be found at www.ed.gov/Technology/challenge.
- National Oceanographic Partnership Program (NOPP) is funded by the National Oceanic and Atmospheric Administration and supports innovative education projects; creating a foundation for a national marine education infrastructure. Information on NOPP can be found at www.nopp.org

Status: The field of environmental education is gaining in both the formal and non-formal education infrastructure in many states. Support for capacity building has grown and comprehensive state-level programs have become more pervasive over the last three years. In response to inconsistency in environmental education nationwide a set of standards have been developed to provide students, parents and educators with a set of common guidelines. Standards provide focus and direction and facilitate a quality education that is equitable, coherent and efficient. Three complementary sets of standards have been developed: environmental education materials standards; student performance standards; and educator performance standards. The environmental education standards support other standards in other disciplines such as mathematics, science, geography and history. These and all other academic standards are voluntary and do not define a national curriculum and do not prescribe how these subjects are taught at the state and local levels. It is expected that locally appropriate curricula will be developed using these national standards for environmental education and other subject areas as guidelines, which will monitor the quality of the student's education. Educators at the national, state and local levels are working towards ensuring that

environmental education is an integral part of every student's schooling. Infused throughout the curriculum, environmental education supports the high standards set by the traditional disciplines. Environmental education encompasses the knowledge and skills that are essential to maintaining equilibrium between quality of life and quality of the environment. A comprehensive, cohesive environmental education program enhances the development of science process skills, the understanding of concepts and provides an opportunity to apply science learning within a real-world context.

Capacity-Building, Education, Training and Awareness-Raising:

Information: Information regarding the programs and projects of the Office of Environmental Education (OEE) can be found at www.epa.gov/enviroed. This site will allow the user to access a number of other sites, including other federal agency sites, related to education and environmental education. The National Environmental Education Advisory Council's Reports to Congress are also published on the site. OEE also provide support for several non-EPA environmental education Internet sites including: EE Link (<http://eelink.net>) database of environmental information and resources and links to quality environmental education databases; EdGateway (www.edgateway.net) provides information on environmental education and education reform. Information on the Technology Innovation Challenge Grant (TICG) program can be found at the website www.ed.gov/Technology/challenge/.

Research and Technologies: Historically, most of the research on the connection between environmental education and academic achievement and the connect between environmental education and the achievement of national human health and environmental protection goals have been qualitative and/or anecdotal. Anecdotal evidence suggests that community/local area investigations, citizenship participation and environmental studies courses are the most effective methods for achieving national environmental literacy. However, many existing studies were not rigorous in the sense that they may or may not have used control groups and there may have been more than one variable influencing the outcomes. With the emphasis on improving student academic performance and the recognition of the potential for environmental education to contribute to the achievement of the national education goals, more quantitative research is being undertaken, much with the support of EPA's Office of Environmental Education. To make meaningful conclusions about the effects of environment-based learning on student achievement, these studies include analysis of student and program characteristics associated with different types of learning outcomes. Some current research initiatives include:

- EPA's Office of Environmental Education is providing support for research in the following areas: whether or not environmental education is increasing science achievement levels for special needs students; the extent to which integrating environmental education into elementary science instruction impacts student achievement as measured by standardized testing; collecting information and test scores that will determine the extent of coverage in schools of environmental issues and to assess the effects of the incorporation of these issues on teaching and learning; to assess the relationship between length of in-service teacher training and the successful use of environmental education materials; the impact of education vs. enforcement on citizen behavior; the immediate and long-term effectiveness of environmental education to meeting specific environmental protection goals; how to incorporate environmental education into the curriculum of colleges of education for pre-service teachers; and the effects of environmental education on student learning and academic performance in middle and high schools by measuring changes in critical thinking and problem solving skills. OEE is also collaborating with the National Academy of Sciences to explore the impact of education, information and voluntary compliance measures on environmental protection.
- State Education and Environment Roundtable (SEER) has completed a quantitative study as a follow up to a qualitative study of 40 schools to demonstrate how, why and to what degree using the environment as a

context enhances learning and increases academic achievement. Information on the State Education and Environment Roundtable can be found at www.seer.org.

- The North American Association for Environmental Education (NAAEE) recently reported that the strategies commonly used in environmental education—inquiry and problem-based learning, democratic learning practices that emphasize varied learning styles and issues-based content—contribute positively to academic achievement in all academic areas, not just in knowledge of environmental concepts. Information on the North American Association for Environmental Education can be found at www.naaee.org.
- Research in the area of sustainable community development is being conducted in cooperation with Northwestern University’s ABCD Institute and many land-grant university centers on the refinement and applications of asset-based community development.

Financing: Funding for environmental education in federal agencies is most often obtained from funds designated for the delivery of other, mandated programs, not as a directly budgeted program. The largest single funding source for environmental education comes through EPA’s Office of Environmental Education. For the last several years, the Congress has appropriated less than \$8M to support OEE’s programs, which in turn support programs at the international, national, state and local levels. The Department of Education’s Technology Innovation Challenge Grant (TICG) was a national competitive grant program that supports the demonstration of new and innovative approaches to using technology and development of new applications that integrate technology into the curriculum, expand effective models, and promote adaptation of proven practices that improve the teaching and learning process. Funding for the TICG program expired in FY 2001. Outside of the federal government, funding for environmental education at the state and local levels is inconsistent. Funders have historically preferred to support specific environmental education programs or materials, not capacity building efforts. The National Environmental Education and Training Foundation (NEETF) was founded to support the field of environmental education by developing public/private partnerships that link environmental knowledge with issues such as health care, business, natural resource management and education. Information on the National Environmental Education and Training Foundation can be found at www.neetf.org.

Cooperation: International cooperation in environmental education includes information exchanges, presentations at international environmental education and sustainable development conferences, and collaboration on project development. OEE, in partnership with Peace Corps and the North American Association for Environmental Education has supported several environmental education programs targeted to Eastern and Central Europe, Latin America and Mexico. These projects provide an opportunity for country teams to guide regional networks, analyze quality environmental education programs and develop action plans for the implementation of capacity building programs in their respective countries.

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CHAPTER 37: NATIONAL MECHANISMS AND INTERNATIONAL COOPERATION FOR CAPACITY-BUILDING IN DEVELOPING COUNTRIES

This issue has been covered under the heading **Capacity-Building, Education, Training and Awareness-Raising** in the various chapters of this Profile.

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CHAPTER 38: INTERNATIONAL INSTITUTIONAL ARRANGEMENTS

This issue deals mainly with activities undertaken by the UN System. Examples of U.S. engagement in many of the international institutional arrangements are found throughout this profile.

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CHAPTER 39: INTERNATIONAL LEGAL INSTRUMENTS AND MECHANISMS

The United States is a party to numerous bilateral and multilateral agreements that promote sustainable development in the United States and in other countries. Some of these agreements are discussed in other chapters within this profile. We note in particular the cooperation among the United States, Canada and Mexico in promoting regional environmental protection under the North American Agreement on Environmental Cooperation under the North American Free Trade Agreement. A list of treaties and other international agreements to which the United States is a party is published in *Treaties in Force*, an annual publication of the United States Department of State (www.state.gov).

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CHAPTER 40: INFORMATION FOR DECISION-MAKING

Decision-Making: The U.S. government does not have a formal plan that addresses information for sustainable development decision-making. There are, however, activities in several agencies and a government effort, spearheaded by the Interagency Working Group on Sustainable Development Indicators (SDI group), to develop a draft set of national sustainable development indicators. The group was created in January 1994 as a volunteer effort later formalized through Memoranda of Agreement signed by participating Agencies and a charter from the White House Council on Environmental Quality. The group continues its work and is currently updating its report. A significant contribution the SDI Group has made is to highlight the distinction between quality of life indicators that measure the economic, environmental and social trends today with the condition of the various resources and capacities that the current generation inherited from its forebears and will alter and pass on to their children. The SDI Group presents measures of whether these endowments are diminishing or improving. Achieving the U.S. goals for sustainable development requires multidisciplinary analysis of data and information to an extent never before attempted. This includes the analysis of inter-linked environmental changes that occur on multiple temporal and spatial scales, which is challenging both technically and intellectually. For example, many types of satellite and in-situ observations at multiple scales need to be integrated with models and the results presented in understandable ways to all levels of the research community, decision-makers, and the public. Additionally, very large volumes of data from a wide variety of sources and results from many different investigations need to be readily accessible to scientists and other stakeholders in usable forms that can be used together.

A number of U.S. agencies have identified the gathering, application, and dissemination of credible data as priorities in their strategic planning process. For example, the Bureau of Economic Analysis in the Department of Commerce has developed a framework for integrated economic and environmental accounts (IEEAs). Federal, State and local governments have programs for gathering and sharing environmental data. At the Federal level, the Mission to Planet Earth Program, the Global Earth Observing System and the Data and Information System of the National Aeronautics Space Administration provide data about the earth's land surface, water, and other characteristics to a broad range of users. The National Oceanic and Atmospheric Administration (NOAA) provides timely access to global environmental data and information from satellite and ground-based sources and serves as the steward of the largest collection of atmospheric, climate, and oceanographic data worldwide. NOAA operates four national data centers that also serve as World Data Centers, and as such, they are the formal mechanism for the international exchange of data for climate, Earth geophysics, the U.S. coast, and the global oceans. The Department of Agriculture maintains a variety of ground-based environmental monitoring networks, surveys and inventory programs for water quality and quantity, soils, natural resource condition, land use cover, and other parameters. Information collected and managed for decision-making is highly dispersed within the U.S. government. At the federal level, a number of U.S. agencies are responsible for collecting environmental, health, demographic, economic and social information through a variety of statistical and reporting programs. For example, the SDI Group, through its representatives from various departments and agencies, has attempted to utilize as much of this work as possible. State and local agencies also collect the same type of information. Federal agencies are governed by the requirements of the Freedom of Information Act (FOIA), which provides for citizen access to government documents and information. Most state and local governments have similar FOIA requirements.

The major principles in the EPA's 5-year strategic plan released in July 1994, (including, in part, ecosystem protection, environmental justice, pollution prevention and partnerships) are reflected in the EPA's data collection and management activities. EPA has several databases, including the Inventory of Information Systems, Access EPA, The Guide to Federal Water Quality Programs, and A Guide to Selected National Environmental Statistics in the U.S. Government. The data are not qualified as to their relevance to sustainable development, however. EPA and Department of Interior are completing internal surveys of their data capabilities to contribute to the development of resource and environmental sustainable development indicators. The Department of Commerce

has initiated a survey process and other agencies are considering undertaking a similar activity. The SDI group keeps apprised of these efforts.

The mission statement in the USDA Forest Service's Strategic Plan (2000 Revision) reflects sustainable development principles ("sustaining the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations"). The plan establishes a long-term objective of improving the knowledge base needed to support decision-making and sustainable management of the Nation's forests and rangelands. As part of meeting this challenge, the Forest Service is expanding the Forest Inventory and Analysis and Forest Health Monitoring programs to all 50 states and to U.S. territories, and is taking steps to include grassland and aquatic ecosystems and urban areas, as well as forests. The President signed an Executive Order on Environmental Justice on 11 February 1994 that, among other things, directs all federal agencies to ensure that low-income and minority communities have access to better information about their environment and have the opportunity to participate in shaping government policies that affect their community's health.

Programmes and Projects: The Department of Energy has undertaken several initiatives to enhance data relating to energy production, importation and consumption in the United States. The department has recently issued guidelines for compiling an inventory of greenhouse gas emissions and new and existing data sets have been used to develop and expand the Department's integrated Dynamic Energy Analysis Simulation (IDEAS) model. IDEAS provide detailed projections of U.S. energy supply, demand, prices, cost and emissions for up to 40 years.

Similarly, the Department of Agriculture has undertaken several initiatives to improve the quality and distribution of data related to sustainable resource management. For example, the USDA-Forest Service's Local Unit Criteria and Indicators Development project (LUCID) was initiated at the field level to identify the conditions that are necessary for sustainable management of ecological, economic and social systems and to test the criteria and indicators necessary to assess how forest management is influencing sustainability. Six National Forests are participating in LUCID. Working with assistance from USDA Forest Service International Programs and USAID, LUCID has been coordinating a project in the temperate forests of Chihuahua and is now considering a second test in tropical Mexico. (See also under Decision-Making).

Recent legislation has directed the USDA Forest Service FIA program to collect field data across its systematic grid annually to provide estimates of change in forest ecosystems. Linking this annual "ground truth" data to emerging remote sensing technologies will greatly enhance spatial analysis of the Nation's forests. One example of a significant partnership to promote development of remote sensing technology in a consistent way is the Multi-Resolution Landscape Characterization (MRLC) Consortium supported by the U.S. Forest Service, U.S. Geological Survey (USGS), EPA, NOAA, and U.S. Fish and Wildlife Service (USFWS). This Consortium is acquiring full multi-seasonal Landsat 7 coverage for the entire United States to develop a joint land cover classification system that all agencies will use.

Status: Computer networks are now generally available throughout both the public and private sectors. Most federal, state, and local governments now make vast amounts of information available on the worldwide web. In 2000, 41.5 percent of households in the United States had access to the Internet and the number of people with regular access continues to rise quickly. With the increased use of the world-wide web, the availability of information has improved. Specific examples of U.S. government sources include:

1) Various sites for the efforts on sustainable development: Examples are the Roundtable on Sustainable Forests (www.sustainableforests.net); the Sustainable Minerals Roundtable (<http://www.fs.fed.us/servicefirst/sustained/iemeindex.html>); and the Sustainable Rangelands Roundtable (<http://www.cnr.colostate.edu/RES/srr/index.html>).

2) The website for the Resources Planning Act (RPA) Assessment of Forest and Range-Lands and the supporting technical publications (www.fs.fed.us/pl/rpa/list.htm), which reports on the status and trends for all renewable resources on all of the nation's public and private forests and rangelands. The 2000 RPA Assessment is the first

national scale assessment in the United States to be organized around criteria and indicators for sustainable forest and rangeland management.

3) Forest Inventory and Analysis (FIA) website for forest inventory data (www.fia.fs.fed.us). The FIA program of the Forest Service has been in continuous operation since 1930 with a mission to “make and keep current a comprehensive inventory and analysis of the present and prospective conditions of and requirements for the renewable resources of the forest and rangelands of the United States.” FIA has produced 7 national assessments of the nation’s forest resources since 1952.

4) The NRCS database website (<http://www.nrcs.usda.gov/TechRes.html>) provides access to base maps, natural resource condition and land use status maps, the National Resources Inventory (NRI) database, and data bases on soil, water and climate, plants for conservation, and other subjects. This site is a node of the National Spatial Data infrastructure.

Although the government retains the capability to access remote sensing data, the cost of the data is a constraint to usage. Data and information pertaining to environmental quality, human and ecological health and social and economic welfare are relevant to sustainable development and are collected by a variety of government agencies and institutions. This data has not yet been integrated into a unified data management system for sustainable development. In the United States, NGOs and federal, state and local level governments are leading efforts to define and apply sustainable development principles and develop indicators to measure progress. Through partnerships and outreach, however, other sectors of society are fast becoming users of sustainable development information. In addition to government sources of data and information, academic institutions, NGOs and industry are major sources of environmental information. The major foreign sources of information for sustainable development include UNEP's GEMS, GRID, GCOS, IRPTC and INFOTERRA.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: Information technology, especially geographic information systems (GIS), have tremendous potential to improve the quality of information available to guide decision making by farm and forest managers, agency personnel, and policymakers, and to improve public health and safety and protect the environment. The technology available to solve many program and policy problems requires resources from multiple agencies. To use GIS to its best advantage requires the systems to be constructed with many diverse data sets, which are maintained by a variety of agencies. In the newly released report, “Food and Agricultural Policy: Taking Stock for the New Century,” USDA recognizes that GIS can be an important tool in efforts to: 1) improve agricultural productivity; 2) improve environmental stewardship; 3) protect food safety and reduce animal diseases; 4) improve rural community planning; 5) improve emergency response; and 6) improve record keeping for improved program implementation.

A variety of agencies and departments are conducting scientific research that provides data and necessary information to inform decision-makers. One example is the Research and Development arm of the USDA Forest Service (FS R&D) (<http://www.fs.fed.us/research/corporate>) is one of the world's leading forestry research organizations, conducting and sponsoring basic and applied research. This research generates credible, relevant knowledge and exciting new technologies that are to sustain the health, productivity, and diversity of the nation's forest and rangelands to meet the needs of present and future generations. Creating and communicating knowledge and technology to private landowners so they can better sustain the health, productivity, and diversity of their lands is as important to FS R&D serving the needs of public land managers.

Financing: No information available.

Cooperation: The various U.S. agencies have engaged in extensive development of interagency data and information processes to address these needs, primarily through fostering better integration among U.S. Government data and information centers that have traditionally developed along disciplinary lines to serve specific scientific and operational communities. Included has been the development of the Global Change Data and Information System (GCDIS) in response to the need to coordinate among the disparate data centers and systems in the participating agencies and to facilitate making data readily available to users. GCDIS currently provides a gateway for discovery and information access among more than 70 federally funded sources of data, both governmental and academic. During the last decade, significant strides have been made in GCDIS' seamless connections between diverse data sets and sources as well its ability to search across the full complement of sources. The World Wide Web has facilitated immeasurably this effort.

A new Federal Geographic Data Committee (FGDC) Working Group on Sustainable Forest Data was chartered in 2001. The Federal Interagency Memorandum of Understanding (MOU) guides this work on Sustainable Forest Management Data initially signed on 16 October 2000. The FGDC working group provides a common interagency forum for Federal coordination to resolve issues integral to collecting, monitoring, analyzing, reporting, and making data available on an ongoing basis related to the Montreal Process Criteria & Indicators (C&I, see also Chapter 11). The USGS database on water can be found at <http://water.usgs.gov/nwis/>.

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CHAPTER: INDUSTRY

Please refer to **Chapters 24 To 32: Strengthening The Role Of Major Groups (Business and Industry Section)**.

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CHAPTER: SUSTAINABLE TOURISM

Decision-Making: The demand for recreation and tourism by U.S. citizens and visitors is growing. Studies indicate that most Americans recreate close to home. The responsibility for meeting the demand is shared by government as well as private individuals and businesses through commercial and not-for-profit ventures. As the interest in the out-of-doors has grown, the number and diversity of public and private organizations involved has also grown and diversified. Federal lands, lakes, and other resources not only provide the backdrop for recreation and tourism, they are extensively used for hiking, boating, camping, skiing, nature study, and many other activities. “Gateway communities” bordering public lands, including national and state parks, national forests, wildlife refuges, and heritage areas are experiencing rapid change as a result of increased tourism and retirement home development. And hence a vast array of government and non-governmental interests are involved from the resource conservation and community development perspectives. Within the U.S. government, the U.S. Department of Commerce’s Tourism Industries Office serves as the interagency policy coordinator for the U.S. government on issues related to tourism, including sustainable tourism. In this capacity, the Tourism Industries Office works cooperatively with other agencies to ensure that the national interest in tourism is fully considered in federal decision-making affecting tourism development. The office seeks to work with the private sector and state and local governments on issues and problems that require Federal involvement. To bring an issue or problem to the attention of the U.S. National Tourism Office, any citizen may contact the office by telephone at (202) 482-0140. Additionally, federal land management agencies provide sites, venues, amenities, and a variety of programs for recreation and tourism related to federal public lands in the United States. They also coordinate with and assist many others, including private landowners, business owners, and communities in rural and urban America, on recreation and tourism associated with land and water owned and managed by others.

Programmes and Projects: The diverse environment and extraordinary landscape of the United States are major tourist attractions, and federal and local tourism officials continually promote the need to maintain and protect this precious resource. National Tourism Week is celebrated the first full week of May by thousands of communities across the United States in recognition of the substantial contribution of travel and tourism to the U.S. economy. The 50 U.S. states have travel and tourism offices and programs that are administered at the state-level, and many states have sustainable tourism policies, particularly in the West. The Travel Industry Association of America serves as the principle trade association for the industry and is dedicated to keeping the travel and tourism industry informed on a variety of issues. Travel and tourism data and program information is available through the Office of Tourism Industry’s website at <http://tinnet.ita.doc.gov>.

The Recreation Agenda of the USDA Forest Service (FS) directly supports the agency’s mission “to sustain the health, diversity, and productivity of the nation’s forests and grasslands to meet the needs of present and future generations” by focusing on quality recreation opportunities within the sustainable capabilities of national forest ecosystems through settings, service, conservation education and interpretation, community connections and relationships, and partnerships. A number of efforts are underway to address diverse interests and needs in sustainable ways. For instance, the FS has developed a Built Environment Image Guide using sustainability concepts to shape the design and construction of facilities. Educational efforts, like “Leave No Trace,” focus on the general public as well as specialists and practitioners who provide recreation services. Grassroots projects in the Ozark Mountains and elsewhere are fostering ecotourism experiences. Communities and states are involved in planning and implementing Scenic Byways. Big events, like the 2002 Olympics and the Lewis and Clark Bicentennial Trail Recognition, provide opportunities to collaboratively develop destinations, facilities, and other products and services for longer-term use. More information is available on the FS web site (<http://www.fs.fed.us>).

Status: Historically, the U.S. population has been unevenly distributed with concentrations around major industrial, transportation, and port areas. As the population has increased and people moved from cities to suburbs and rural places, the rural-urban patterns and demands for services have changed. In addition immigrants continue

to change American society. Changing demographics and demands for recreation and tourism are resulting in policy and program issues from both human and natural resource perspectives. As interest in the out-of-doors continues to grow, the list of desired pursuits is getting longer and more diverse. Growing coalitions of people are incorporating sustainable approaches to recreation and tourism as part of their “smart growth” and “smart conservation” efforts underway, especially in rapidly urbanizing areas. Within local environments, the preservation of specific lands, waterways, and highways are maintained through an array of national designations as well as state designations. The developers of new products and sites have become even more sensitive and intent on minimizing negative environmental impacts. For example, some development areas require environmental assessments to be conducted first on the impact before zoning rulings are made. Restoration efforts are also a large part of the expression locally to ensure the environmental impact of tourism development, as demonstrated by the efforts of historic preservation society citations.

Recent trends in travel for more adventure and outdoor activities impose an even greater responsibility for tourism development efforts and developers to ensure the sustainability of any new product offerings. With the wide range of geography in the United States, it is considered critical to support coordinated efforts, to the extent possible, for sustainable tourism development. The United States stresses the importance of responsible sustainable tourism development and encourages coordinated working partnerships to accomplish this. Growing concern exists in the United States about the introduction and spread of invasive species, many of which are unintentionally introduced when people and products are transported by air, water, rail, or road. A federal interagency system has been put in place co-chaired by the U.S. Secretaries of Agriculture, Commerce, and Interior to address the various aspects of the problem using prevention, early detection and rapid response, research and monitoring, natural resource management and restoration, public outreach, and more.

Capacity-Building, Education, Training and Awareness-Raising: Many partnerships exist to build capacity, educate, train, and raise awareness of landowners, communities, service providers, and the public. As the national economy has diversified beyond its natural resource and manufacturing base, communities are looking for alternative and more global solutions. These include: *Cultural Heritage and the Arts*: A number of government agencies and non-governmental organizations are focusing on the arts in relation to recreation, tourism, and community development. For instance, the National Endowment for the Arts (NEA) is working with other agencies and organizations through the National Rural Development Partnership to foster innovation and highlight arts-related opportunities. Resources include a new publication on *Stories Across America: Opportunities for Rural Tourism* has been published by the National Trust for Historic Preservation in collaboration with the NEA and the U.S. Departments of Transportation and Agriculture. In addition, NEA and the FS have jointly focused assistance to forest-dependent rural communities diversify local economies and strengthen their communities through arts and forestry. More information on arts-related partnerships and opportunities is available from individual State arts agencies, the NEA (<http://arts.endow.gov>) and the FS (<http://fs.fed.us>). *Alternative Enterprises and Agritourism*: USDA is highlighting alternative enterprises and agritourism that allow farmers and ranchers to earn higher profits by replacing or supplementing traditional farm operations with innovative, sustainable on-farm and on-ranch ventures. These include heritage tourism (e.g., historic farm tours, reenactments, and cultural events) and other recreation, education-, and nature-based opportunities. The information is being shared and used by Resource Conservation and Development Councils (RC&D) in their work with local governments and communities toward sustainable community development. A toolkit, success stories, information sheets, and other links are available on the web site of the USDA Natural Resources Conservation Service (<http://www.nhq.nrcs.usda.gov/RESS/econ/altenterprise/Toolkit.html>); and more information about RC&Ds is available from the National Association of RC&D Councils (<http://www.rcdnet.org>).

Information: The FS works with other agencies and organizations to integrate social sciences with ecosystem management. This includes analyzing market trends, public perceptions, and other social conditions related to recreation and tourism through the Outdoor Recreation and Wilderness Assessment unit of the FS’s Southern Research Station. The results of studies are often published as reports and books. For example, a book on Trends

in Outdoor Recreation, Leisure, and Tourism was published in July 2000. In addition, as part of its national web-based Natural Resources Information System the FS works with the University of Georgia to maintain a Human Dimensions framework and database for conducting social assessments. More information is available on the Internet (<http://hdf.itos.uga.edu>)

Research and Technologies: Since 1960 federal agencies have been assessing outdoor recreation participation on an ongoing basis. The 2000 National Survey on Recreation and the Environment, coordinated by the FS and the National Oceanic and Atmospheric Administration, explored outdoor recreational needs and environmental interests of the American people through a survey of 50,000 households across all ethnic groups. Survey results are made available to the public through the Internet, books, and reports. Information about the survey and its results is available on the Internet (<http://www.srs.fs.fed.us/trends/nsre2>).

Financing: The travel and tourism sector is an essential component of the U.S. economy and represents the United States' fourth largest export, with \$103 billion in revenues (international traveler expenditures in the United States), generating a \$14 billion trade surplus in 2000. The revenues supported more than one million jobs in the United States and produced over \$22 billion in federal, state and local taxes.

Cooperation: The United States strongly supports sustainable tourism development in order to ensure the longevity, quality and value of the environment. The federal government cooperates with state and local officials, industry associations and travel and tourism councils around the country to ensure continued growth, dynamism, and sustainability of the U.S. travel and tourism industry. The United States has participated in collaborative intergovernmental efforts and creating manuals which frame the principles for an organized tourism planning and management approach to ensure environmental integrity.

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