

Abridged and Illustrated for Easy Understanding

Annual Report on the Environment in Japan 2003

Local Communities Leading the Transition to a Sustainable Society



Ministry of the Environment

To Our Readers

This booklet was compiled based on the *Quality of the Environment in Japan 2003* (White Paper), an annual report on the environment by the Government, published in accordance with a Cabinet decision made on May 30, 2003. The content of this booklet was edited to gear to a wider readership.

The theme of this year's White Paper is "Local Communities Leading the Transition to a Sustainable Society." It introduces that daily voluntary activities carried out in local communities mark the first step in the transition to a sustainable society.

The White Paper first shows the close interaction of the environment, society and economy, and the seriousness of the deterioration of the global environment. The Paper demonstrates that steady efforts at the individual and community levels will be essential for resolving global environmental problems. Individual actions are explored with an emphasis on the idea that if more individuals pursue environment-conscious activities, their activities will influence other actors, such as the government and businesses, and make it possible to reform the socio-economy as a whole. Initiatives by local communities are also examined. The Paper concludes that transition to a sustainable society is possible by (1) raising the awareness of the whole community and building capacity (local environmental capacity) for the creation of a better environment and a better community, and (2) creating a model for protecting the environment and reinvigorating the community at the same time, and spreading the practice to other communities.

There will be no greater joy to us than knowing that this booklet has prompted the interest of readers in environmental issues and provided an impetus for concrete actions towards the building of a vibrant and sustainable society.

The drawing on the cover page is the work of Machi Takewa, a first-year student at the Osaka City Chikko Junior High School. Machi's piece won the Minister of the Environment Award (Elementary and Junior High School Student category) at the Year 2003 White Paper on the Environment Cover Page Illustration Contest sponsored by the Ministry of the Environment and the Japan Environment Association.

Machi said "I hope the oceans will be as beautiful as this in the future. Because the ocean in the Minato Ward is very dirty, I want it to become an ocean with many fish."

The drawing at the back cover is the work of Wakako Okano, a sophomore at the Utsunomiya Media Arts College (Tochigi Prefecture). Ms. Okano won the Japan Environment Association Chairman's Award (general category) at the Year 2003 White Paper on the Environment Cover Page Illustration Contest.

Ms. Okano said, "I pictured what each one of us can do. I drew with the wish that everyone would be considerate to the earth. It will be nice if people can have the self-awareness that they are the residents of the earth and help build a friendly living environment."

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Part One

Local Communities Leading the Transition to a Sustainable Society (Overview)

Introductory Chapter

State of the Global Environment and the Development of Individual and Community Efforts

<Summary of Introductory Chapter>

Today, while the international community is making steady progress in tackling environmental problems, the deterioration of the global environment is becoming serious, which in turn aggravates social problems on a global scale. Before addressing the main topic, this chapter gives an overview of the world situation since the 1992 United Nations Conference on Environment and Development (Earth Summit) and highlights the importance of the efforts made by individuals and communities in their own positions.

Section 1: State of the Global Environment and Society

1. Change in the Socio-economy

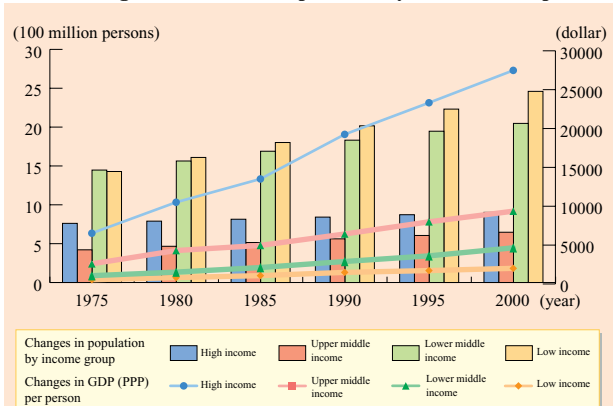
Globalization of the economy and society advanced rapidly in the 1990s, as exemplified by brisk transborder business by corporations, improvements in international transportation, and remarkable progress in information and communications technologies. The world is becoming metaphorically smaller, and countries have become increasingly interdependent. On the other hand, the world's population has grown by about 800 million in the decade between 1990 and 2000. According to the United Nations Environment Programme (UNEP) report, the gap between the rich and the poor has also widened, with one-fifth of the world's richest accounting for 86% of the world's GDP and one-fifth of the poorest accounting for only 1% of the world's GDP.

2. State of the Global Environment

With this change in the socio-economy, the global environment faces a serious situation.

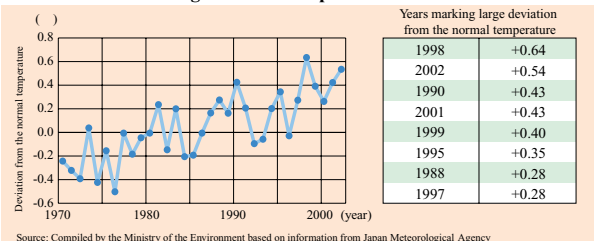
In terms of global warming, the world's average temperature in 2002 was the second highest on record. This high-temperature trend has continued since the mid-1980s. If we continue our present lifestyle, we may be affected in the future. According to the "Influence of Global Warming on Japan 2001", which summarizes studies on the effects of global warming on Japan, a rise of one meter in the sea level would cause a land area under the average high-tide level in Japan about 2.7 times the current level. The number of people and value of property that will be affected will increase from 2 million to 4.1 million and from 54 trillion yen to 109 trillion yen, respectively.

Changes in GDP and Population by Income Group



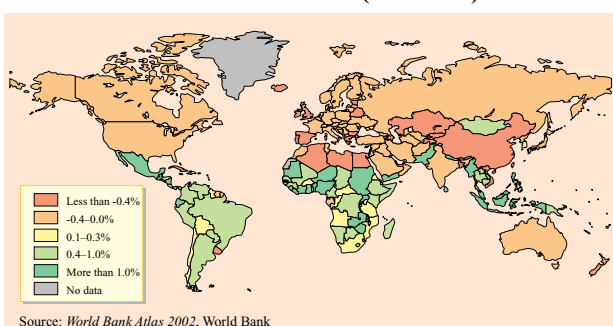
Note: The World Bank's definition is used for the classification of high, upper middle, lower middle and low income groups. Source: Compiled from *World Development Indicators 2002*, World Bank

Secular Changes in Deviation from the Annual Global Average Surface Temperature since 1970



Source: Compiled by the Ministry of the Environment based on information from Japan Meteorological Agency

Annual Deforestation (1990–2000)



Source: *World Bank Atlas 2002*, World Bank

In terms of forests, a total of about 9.4 million hectares of world forests (an area equivalent to the total area of Japan's Chugoku, Shikoku and Kyushu regions) were lost to large-scale forest fires, excessive harvest of wood for fuel, overgrazing and commercial logging in the decade between 1990 and 2000.

Soil degradation is caused not only by climatic factors but also is aggravated by human activities such as agriculture, grazing and improper logging that lead to deforestation. The UNEP reports that about 15% of the earth's land area is affected.

Furthermore, the occurrence of yellow sand and the frequency of its movement in the northeast Asian region, including China, have increased in recent years. According to newspaper reports, the large-scale yellow sand fallout that took place in 2002 was of such severity that visibility in China was so poor that it was impossible to see the building next door, airports and schools were closed down in Korea, and regional transportation in Kyushu, Japan was disrupted.

Today, many countries are faced with various water problems. Over 3,000 people died in a flood along China's Chang Jiang River basin in 1998. About 13 million people in southern Africa faced a serious food crisis in 2002 caused by a drought said to occur once every decade.

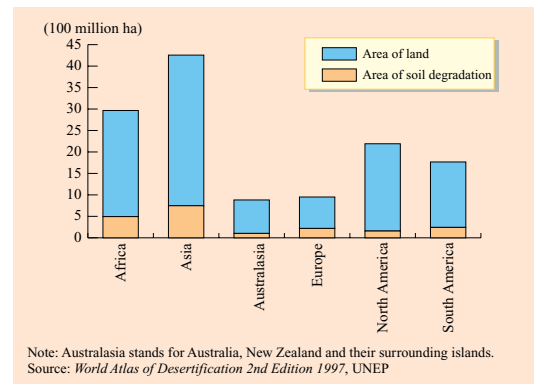
3. State of the Global Environment Seen from Its Relationship with the Society and Economy

The global increase in environmental load is linked to the society and economy in a complex manner.

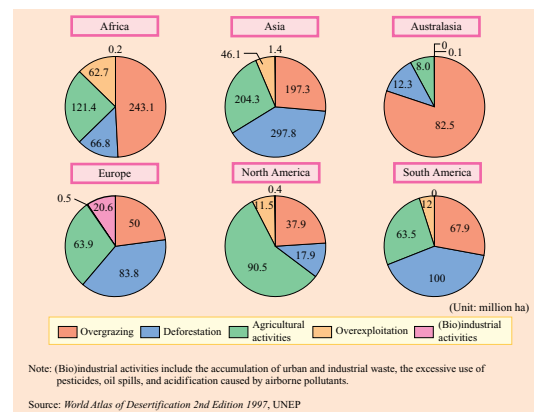
For example, while globalization of the economy helps spread eco-conscious products and technologies to various countries in the world, the international distribution of goods may also increase energy consumption and cause problems with the transboundary movement of hazardous wastes. Furthermore, the deterioration of the environment in developing countries caused by excessive cultivation, grazing and logging of forests exceeding their natural recovery capacity will not only make it difficult to secure sufficient resources and food and worsen poverty but also cause conflict and give rise to environmental refugees.

With regard to the relationship between population increase and the water issue, the *UN World Water Development Report* pointed out that the increase in population also increases the demand for water and lowers the per capita water supply. The concentration of population in the cities of developing countries due to population growth and poverty further worsens the problem. In fact, about 170 million people in cities and 920 million people in rural areas do not have access to safe water supply. Without a

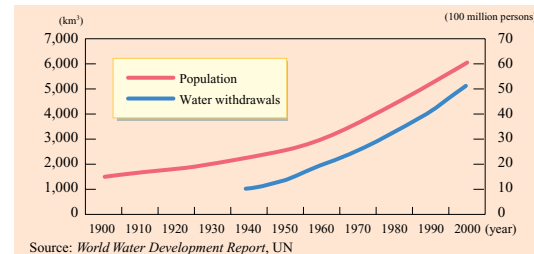
Soil Degradation by Region



Soil Degradation by Major Cause



World Population Growth and Changes in Freshwater Use



Water Supply and Sanitation Coverage by Region

Water supply		Population (2000)	Population served (2000)	Population (2015)
Africa	Urban	297	253 (85%)	501
	Rural	487	231 (47%)	577
Asia	Urban	1,352	1,254 (93%)	1,943
	Rural	2,331	1,736 (74%)	2,404
Latin America and the Caribbean	Urban	391	362 (93%)	504
	Rural	128	79 (62%)	127
Oceania	Urban	21.3	21 (99%)	25.7
	Rural	9.1	5.7 (63%)	10.4
Europe	Urban	545	542 (99%)	566
	Rural	184	161 (88%)	154
North America	Urban	239	239 (100%)	278
	Rural	71	71 (100%)	66
Total		6,055	4,956 (81.8%)	7,154

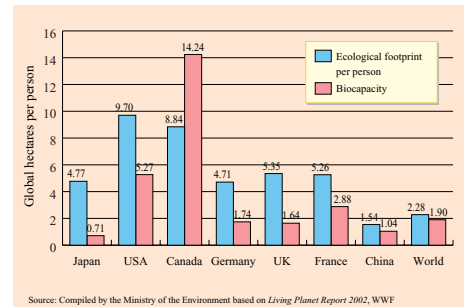
Sanitation		Population (2000)	Population served (2000)	Population (2015)
Africa	Urban	297	251 (85%)	501
	Rural	487	220 (45%)	577
Asia	Urban	1,352	1,055 (78%)	1,943
	Rural	2,331	712 (31%)	2,404
Latin America and the Caribbean	Urban	391	340 (87%)	504
	Rural	128	62 (48%)	127
Oceania	Urban	21	21 (100%)	25.7
	Rural	9.1	7.3 (80%)	10.4
Europe	Urban	545	537 (99%)	566
	Rural	184	137 (74%)	154
North America	Urban	239	239 (100%)	278
	Rural	71	71 (100%)	66
Total		6,055	3,652 (60.3%)	7,154

Note: Since figures are rounded off, the sum of the numbers may not add up to the figures in the "Total" column.
Source: *Global Water and Sanitation Assessment 2000*, WHO

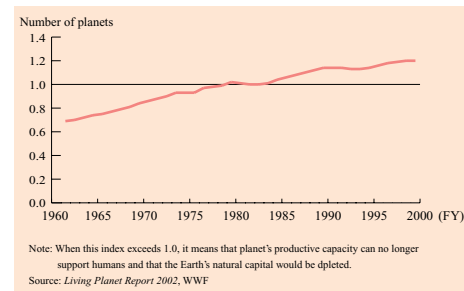
supply of safe water, human health will be affected, resulting in lower productivity, less income and poverty. It is estimated that the world's population will increase 1.1 billion by 2015 with 88% of that population residing in cities, making it especially important to improve municipal water supply systems in cities.

For humankind to survive within the complex relationship between the environment, society and economy, environmental considerations must be incorporated into a socio-economic system that considers the finite nature of the earth. According to a World Wide Fund for Nature (WWF) estimation that compared humankind's consumption of resources to nature's productive capacity, the consumption of resources by humanity already exceeded nature's productive capacity in the 1970s. In view of this, Japanese must reduce current resource consumption by half in order to live within the environmental carrying capacity of the earth. We must take steady and effective measures towards the building of a sustainable society.

Ecological Footprint by Country



World Ecological Footprint (1961–1999)



Section 2: Building of a Sustainable Society from Individual and Community Efforts

1. Johannesburg Summit

Within the close relationship between the environment, society and economy, the root of global environmental problems lies, after all, in people's daily activities in their homes and communities. From this perspective, individual and community efforts are extremely important to build a sustainable society.

In the Johannesburg Summit, national governments, as well as international organizations, local governments, NGOs (non-governmental organizations) and businesses, participated as actors on equal basis and voluntarily announced the implementation of specific projects for achieving sustainable development. "Record of Commitments/Partnerships" of these projects was prepared. Given these achievements, each actor must implement the specific measures it declared at the Summit. As such, individual and community efforts are already beginning at the international level.

Outcomes of the Johannesburg Summit

Type-I-Outcomes: Documents summarizing the results of negotiations and agreements between governments.

The Johannesburg Declaration on Sustainable Development

- A document showing the resolution of head of states to pursue sustainable development. It describes the environment, poverty, and other issues faced by different countries and states the commitments of these countries to improve access to safe drinking water, basic sanitation, energy, food safety and security, etc.; make efforts to contribute ODA at the internationally agreed levels; and strengthen governance.

Plan of Implementation

- A document about initiatives to promote the implementation of Agenda 21. The document is made up of various sections including "Introduction, Poverty eradication, Changing unsustainable patterns of consumption and production, Protecting and managing the natural resource base of economic and social development, Sustainable development in a globalizing world, Health and sustainable development, Sustainable development of small island developing states, Sustainable development for Africa, Means of implementation, and Institutional framework for sustainable development."

Type-II-Outcomes: A document describing voluntary and specific initiatives proposed and declared by each actor. The projects declared by various actors are non-binding in nature. They are called "Type-Twos" to differentiate from agreements.

Record of Commitments/Partnerships

- These are partnerships and initiatives for implementing the Type-I-outcomes. They are specific projects carried out in conjunction with the governments of various countries and international organizations for sustainable development. Japan has registered 30 projects with the United Nations Secretariat, covering the fields of water, forest, energy, education, science and technology, health care, and biodiversity.

Source: Ministry of the Environment

2. Trends of Individual and Community Efforts for Coping with Specific Environmental Problems

At about the same time as the Earth Summit, Japan enacted the Basic Environment Law in 1993. Since then, Japan has worked on establishing a framework for building a sustainable society in each area, including the mitigation of global warming, conservation of biodiversity, and the establishment of a recycling-based society. Although each actor is expected to carry out measures according to its role under this framework, given the characteristics and situation of today's environmental problems, each actor must take voluntary and positive initiatives.

Chapter One

Actions Taken by Individuals towards the Building of a Sustainable Society

<Summary of Chapter One>

Given that many of today's environmental problems originate from daily life and ordinary business activities, individual measures aimed at tackling these problems must carefully be made to cover all aspects of our daily lives and activities. This chapter draws attention to the daily activities of individuals. While showing the specific environmental loads arising from our daily activities, it points out that if the individual actions in daily life were to evolve into a larger movement, other actors could be influenced and become instrumental in the transition to a sustainable society.

Section 1: Changes in the Socio-economy that Affect the Actions of Individuals

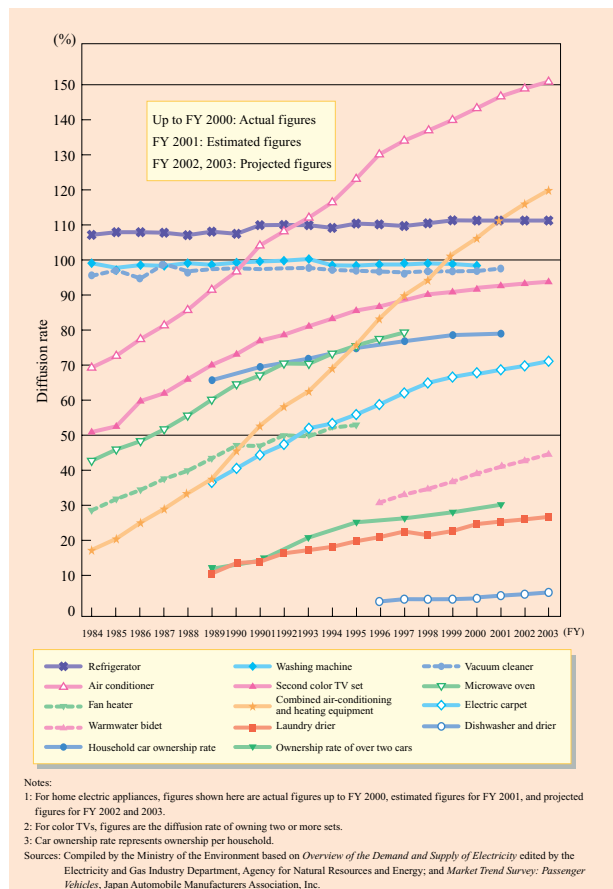
1. Post-war Changes in Japan's Socio-economy and Environmental Problems

In the post-war years between the mid-1950s and mid-1960s, priority was placed on restoration of the economy. With the expansion of productive activities and the rise in incomes, various products, such as the so-called “three sacred treasures” consisting of the electric washing machine, the electric refrigerator, and the black-and-white television, became a part of daily life. Along with these changes, areas in Japan that suffered from pollution also increased nationwide, and the destruction of nature proceeded on a national scale, destruction that included the loss of nature in communities and reclamation of tidelands and shallows.

In the mid-1970s, with the economy shifting towards steady growth, the number of single-person households increased, more women entered the workforce, dining-out and use of processed food such as pouch-packed food increased, and new services such as door-to-door delivery were started. Due to the two oil crises that took place around this time, certain progress was made in energy conservation. However, the environmental load that accompanied ordinary business activities and daily life increased, and urban and domestic pollutions became evident.

Since the “bubble economy” in the mid-1980s, expenses for durable consumer goods, such as the purchase of more than two televisions or vehicles per household, and spending for the service industry, such as for leisure and recreation, showed remarkable growth. With the globalization of economic activities, the socio-economic system of mass production, mass consumption and mass disposal expanded worldwide and tangible signs of global environmental problems became evident.

Diffusion Rate of Durable Consumer Goods in Households



2. Relationship between Socio-economy, Daily Life and the Environment in Recent Years

Changes of the socio-economy in recent years impacted the environment in various ways, in both positive and negative manner.

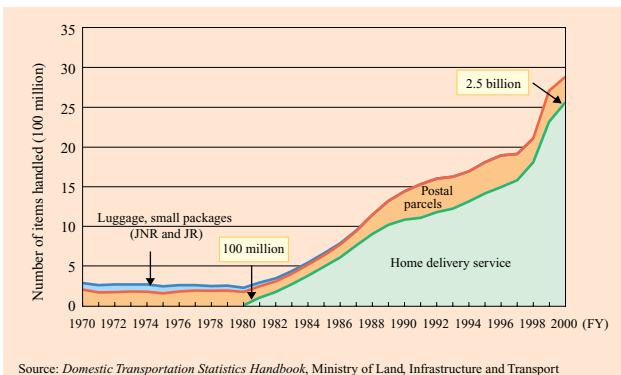
The trends of families with fewer children and an aging population have led to an increase in the number of house-

Chronology of Socio-economic Events of Japan

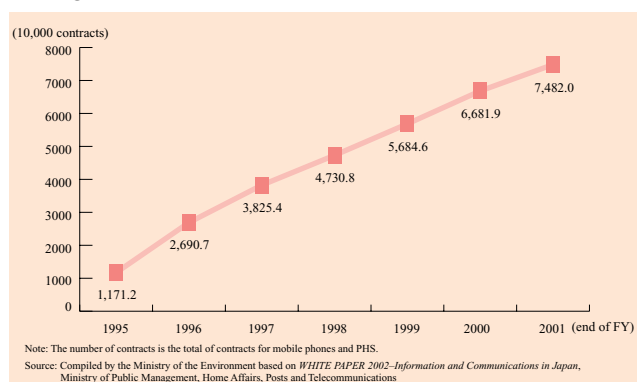
	National and international events	Events related to everyday life in Japan
Rapid economic growth; In search of material wealth	<p>Period of rapid economic growth</p> <p>(1955) Outbreak of Itai-itai disease (Jintsugawa River basin)</p> <p>(1956) Economic Survey of Japan, <i>No Longer in Postwar Era</i>, published.</p> <p>(1956) Outbreak of Minamata disease</p> <p>(1960) Plan to double national income launched</p> <p>Period that raised the issue of pollution</p> <p>(1960) Pollution at Yokkaichi worsened (asthma, etc.)</p> <p>(1962) Smog continued for one week (Tokyo)</p> <p>(1962) <i>Silent Spring</i> by Rachel Carson published</p> <p>(1962) National Comprehensive Development Plan</p> <p>(1964) Tokyo Olympics held</p> <p>(1965) Outbreak of second Minamata disease, Niigata Minamata disease (Aganogawa River basin)</p> <p>(1967) Basic Law for Environmental Pollution Control enacted</p> <p>(1967) Niigata Minamata disease lawsuit, Yokkaichi pollution lawsuit</p> <p>(1969) Mankind's first landing on the moon</p> <p>(1970) Osaka Expo held</p> <p>(1970) Frequent occurrence of photochemical smog in Tokyo; Air pollution from soot and dust and from SOx</p> <p>(1970) 14 pollution-related laws passed at the 64th Diet (so-called Pollution Diet)</p> <p>(1971) Environment Agency founded</p> <p>(1972) <i>Limits to Growth</i> by Club of Rome published</p> <p>(1972) Declaration on the Human Environment issued by the United Nations Conference on the Human Environment; United Nations Environment Programme established</p> <p>(1972) Plan for a drastic modernization of national infrastructure (Japanese Archipelago Remodeling Plan) announced</p>	<p>(1953) TV broadcast started</p> <p>(1953) Emergence of instant foods</p> <p>[Three sacred treasures]</p> <p>B&W TV, electric washing machine, and electric refrigerator</p> <p>(1962) Metropolitan Expressway opened; Private car ownership began to increase</p> <p>(1962) Agricultural population fell to less than 30% of total labor force</p> <p>(1964) Tissue paper appeared on the market</p> <p>(1964) Overseas travel deregulated</p> <p>(1964) Operations of Tokaido Shinkansen Line began</p> <p>(1965) Entire route of Meishin Expressway opened</p> <p>(1966) Japan's population exceeded 100 million</p> <p>(1967) The phrase "nuclear family" became popular</p> <p>(1969) Emergence of freezer/refrigerator (two doors)</p> <p>(1969) Entire route of Tomei Expressway opened</p> <p>(1970) Number of vending machines exceeded one million</p>
Steady growth period; From the pursuit of material wealth to convenience	<p>Period when people became aware of energy issues and environmental problems in urban areas</p> <p>(1973) Fourth Middle East War and the First Oil Crisis</p> <p>(1974) Possibility of CFCs depleting the ozone layer pointed out.</p> <p>(1978) "Urban-type combined pollution" lawsuit in Nishiyodogawa City</p> <p>(1979) Second Oil Crisis; Energy-saving Law enacted</p> <p>(1980) Japan's automobile production became No. 1 in the world</p> <p>(1980) First US Space Shuttle launched</p>	<p>(1974) First convenience store opened</p> <p>(1975) Operation of Sanyo Shinkansen Line (Okayama-Hakata) started</p> <p>(1979) "Energy-saving suits" attracted attention</p> <p>(1982) Emergence of PET bottle</p> <p>(1982) Operation of Tohoku and Joetsu Shinkansen Lines started</p> <p>(1983) The phrase "One-room mansion (apartment)" became popular</p> <p>(1984) Longevity of both Japanese males and females became No. 1 in the world</p>
Period of globalization; Emergence of global environmental problems	<p>(1985) Law for Equal Employment Opportunity of Men and Women enacted</p> <p>(1985) Tsukuba Expo held</p> <p>Period that heightened awareness of global environmental problems</p> <p>(1985) Vienna Convention for the Protection of the Ozone Layer adopted</p> <p>(1986) Nuclear accident occurred at Chernobyl</p> <p>(1987) Montreal Protocol adopted</p> <p>(1988) Intergovernmental Panel on Climate Change (IPCC) established</p> <p>(1989) Oil spill accident of <i>Valdez</i></p> <p>(1990) Remaining capacity of final disposal sites: Volume equivalent to 7.6 years (industrial) and 1.7 years (general) of disposal</p> <p>Period that implemented policies for sustainable development</p> <p>(1992) Earth Summit held</p> <p>(1992) Basel Convention took effect</p> <p>(1992) Convention on Biological Diversity adopted</p> <p>(1993) Basic Environment Law enacted</p> <p>(1994) WTO established</p> <p>(1996) ISO 14001 formulated and issued</p> <p>(1997) Kyoto Protocol adopted at COP3</p> <p>(1997) Oil spill accident of <i>Nakhodka</i></p> <p>(1998) Law concerning the Promotion of Measures to Cope with Global Warming enacted</p> <p>(1998) Japan's GNP became No. 2 in the world</p> <p>(2000) Basic Law for Establishing the Recycling-based Society enacted; Second Basic Environment Plan approved by the Cabinet; World population exceeded six billion</p> <p>(2002) Kyoto Protocol ratified</p>	<p>(1986) Emergence of films-with-lens camera</p> <p>(1987) Mobile phone services started</p> <p>(1987) The phrase "DINKS" became popular</p> <p>(1988) Seikan Tunnel opened; Seto-ohashi Bridge completed</p> <p>(1989) Consumption tax (3%) introduced</p> <p>(1989) Operation of Internet started</p> <p>(1989) Eco Mark introduced</p> <p>(1990) Number of Japanese traveling overseas per year exceeded 10 million</p> <p>(1991) Beef and orange imports deregulated</p> <p>(1992) Two-day weekend system took root; 5-day school week started</p> <p>(1993) Bad harvest of farm produce due to cold summer</p> <p>(1993) Number of convenience stores exceeded 40,000</p> <p>(1994) Water shortage due to severe summer heat</p> <p>(1994) Program subsidizing home-use solar power generation system started</p> <p>(1995) Single-person households accounted for 25% of total households</p> <p>(1997) Consumption tax raised to 5%</p> <p>(2000) Households using personal computers exceeded 50%</p> <p>(2001) Households using Internet exceeded 50%</p> <p>(2002) Mobile phone users exceeded 50% of Japan's total population</p>

Source: Ministry of the Environment

Changes in the Transportation of Products in Small Quantity



Changes in the Number of Mobile Communications Service Contracts



holds. It became necessary for a household, as the smallest unit of daily life, to have its own housing facilities, such as kitchen and bathroom, and durable consumer goods, such as washing machines, refrigerators, etc. The increase in these facilities also resulted in an increase in the consumption of energy and water.

While innovations in information and telecommunications technologies have raised expectation in the reduction of environmental load through work practices known as telework and SOHO and through the timely provision of appropriate environmental information, the increase in information and telecommunications equipment and excessive information exchanges are causing an increase in energy consumption.

While it is feared that individual ownership of equipment and the active 24-hour lifestyle may increase the environmental load caused by daily life, people's desire to spend more time in nature and participate in volunteer activities can be seen as a promising trend that may lead to higher awareness about environmental conservation efforts.

In this way, socio-economic changes often exert positive or negative impact on the environment through daily life. Therefore, it is necessary to fully understand and tackle today's environmental problems as a sequence of problems closely related to changes in our socio-economy and to the way we lead our daily lives.

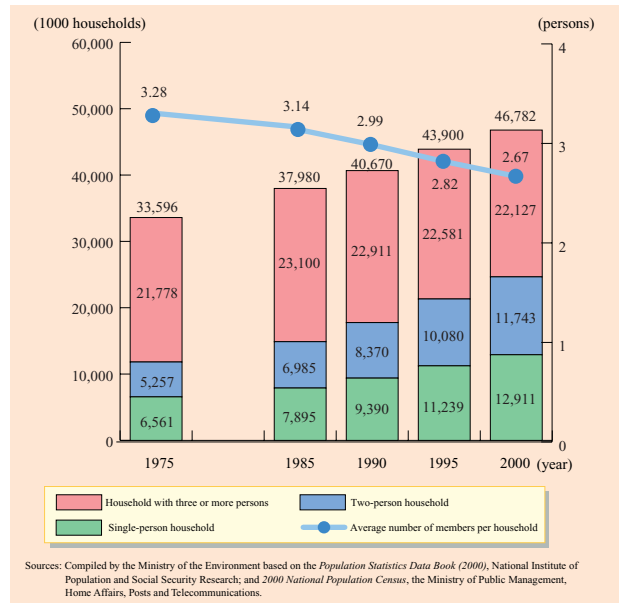
3. Increase in Environmental Load Resulting from Daily Life

Environmental load resulting from daily life increases due to changes in the socio-economy.

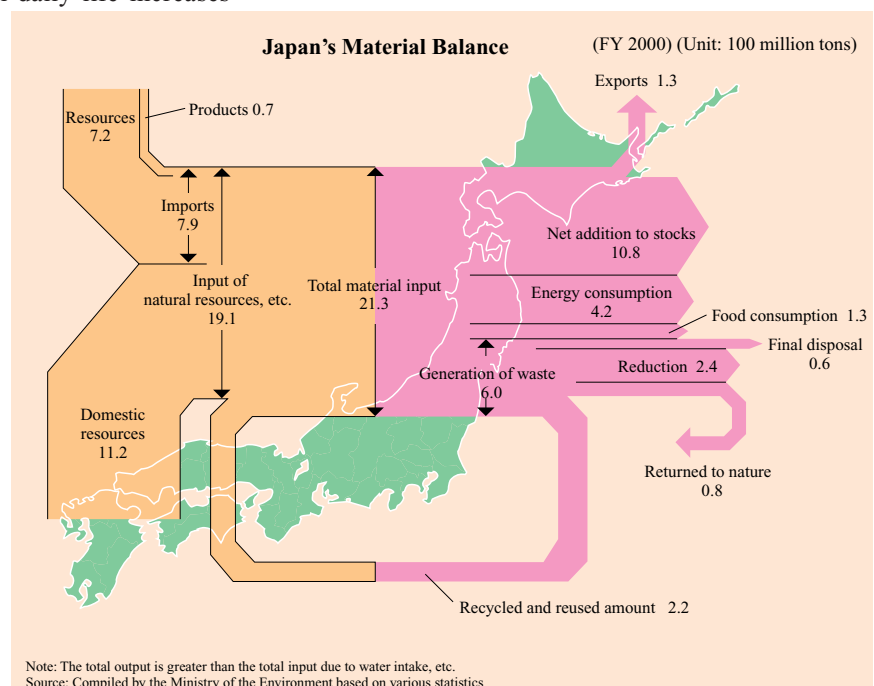
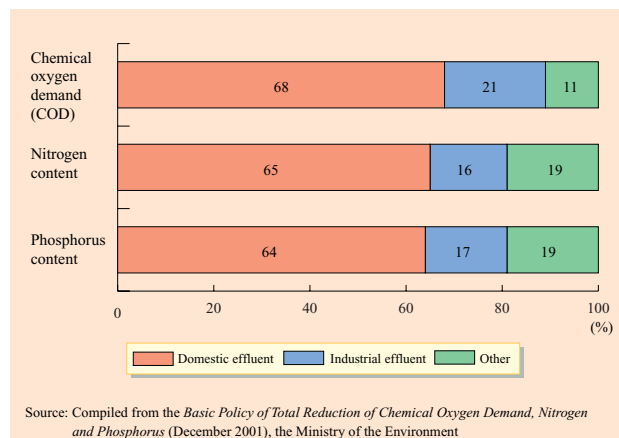
Carbon dioxide, a major contributor to global warming, is emitted from all aspects of our production and consumption activities. In Japan, emissions from the residential sector in FY 2000 increased 20.4% from FY 1990 levels and increased 4.1% from the previous fiscal year.

In terms of Japan's material balance in FY 2000, among the 2.13 billion tons of resources used, about 50% were consumed and disposed of. Only about 10% of the materials were recycled as resources. In terms

Changes in the Numbers of Households and Household Members (General Households)



Percentage of Pollution Load by Source in Tokyo Bay (FY 1999)



of general waste, including “household waste” produced by our daily life, the generation of waste per capita per day has remained at high levels in recent years.

Domestic effluent is the major cause of water pollution in enclosed water areas. In terms of COD, domestic effluent accounts for 70% of the pollutant load, especially in Tokyo Bay.

Section 2: Environmental Load from the Daily Life of Every Individual and Effects of Various Efforts

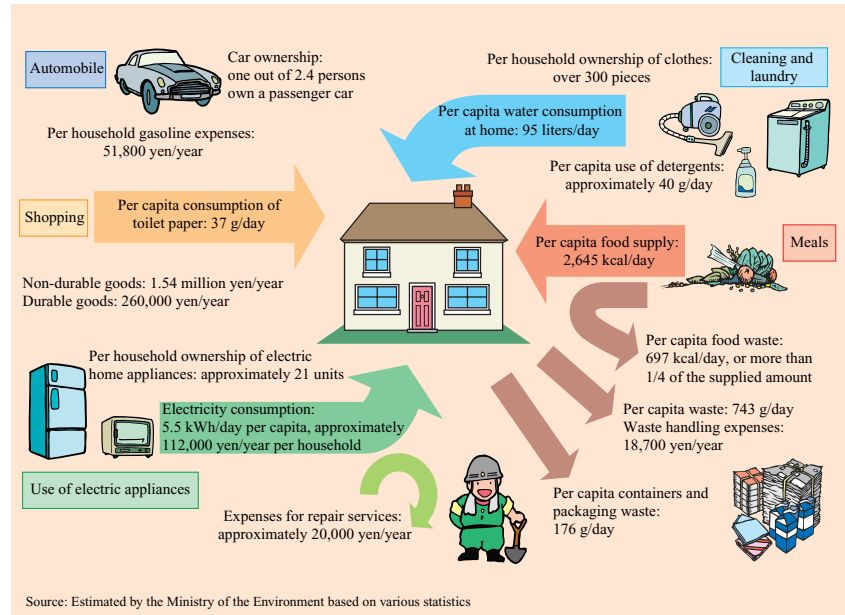
1. Environmental Load from Daily Life

It is important to have an overall view of the load our daily activities exert on the environment. The environment is burdened not only in visible forms, such as the consumption of energy and resources through the use of electric home appliances, supply of water, and purchase of disposable goods, but also from the use to the disposal of products and services, which include the processing of materials and distribution of products.

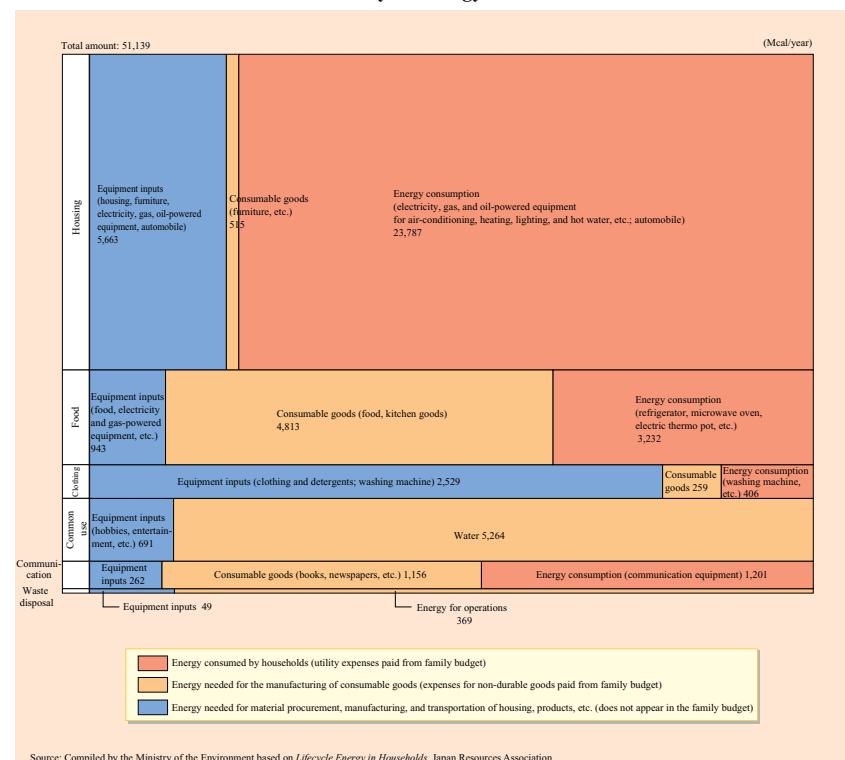
Let us focus attention on product lifecycle energy (amount of energy used by a product throughout its lifecycle). In terms of environmental load, a large percentage of energy consumption in a year resulted from the use of products used in daily life, such as air conditioners and heaters, lighting and vehicles. A product may consume a large amount of energy in its manufacturing process, but its energy consumption per year may be smaller. On the other hand, the energy consumption of electricity or detergent may be small per day but may be substantial when calculated for an entire year.

Comparing the product lifecycle energy used in 1979 and 1994, energy consumption during production decreased 24%, thanks to energy conservation efforts in plants and other facilities; however, overall energy consumption increased 5.5% due to substantial increases in the use of electricity, gas and oil at homes.

Environmental Load from Daily Life



Breakdown of Lifecycle Energy Used in Households



Food mileage (unit: ton-km) is an index that shows the distance between the place where the food is produced and where it is consumed—a yardstick to measure environmental load caused by transportation. With a low food self-sufficiency rate, Japan is experiencing an increase in environmental load from food imports.

In view of the fact that environmental loads from our daily lives, including those resulting from activities not taking place within our living areas, are the cause of global environmental problems, we must make conscious efforts to consider the environment in our daily activities.

2. Reduction of Environmental Load in Daily Life and Concrete Effects

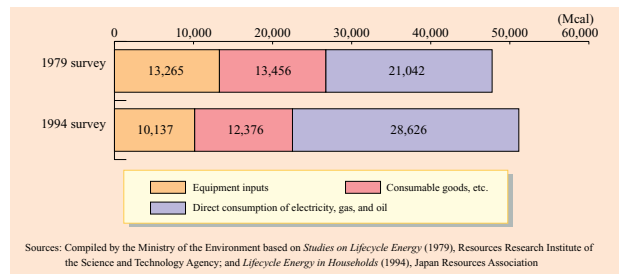
We can take various environmental-conscious actions in our daily lives.

The following are some examples of such actions: energy saving by adjusting the temperature of air conditioners and heaters to an appropriate level and making conscious efforts to save electricity; saving resources by reducing waste and recycling; and using environment-friendly products and services. For our leisure activities, we can participate in the activities to conserve and create a rich environment such as eco-tourism and environmental volunteer activities.

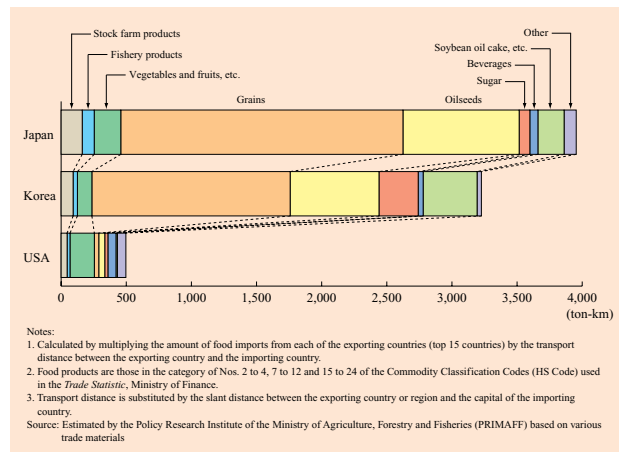
The results of these measures are diverse. For example, even if the effect of each measure is small, if all households in Japan attempt ten actions, about 34.7 million tons of carbon dioxide can be reduced. This is equivalent to 2.8% of the amount of emissions of the base year as provided in the Kyoto Protocol. An accumulation of casual

actions in daily life can have great significance. However, in view of the fact that carbon dioxide emissions from the residential sector is in the increase, we cannot say that our actions in our daily lives are achieving satisfactory results, making it even more important to start with activities in our everyday lives.

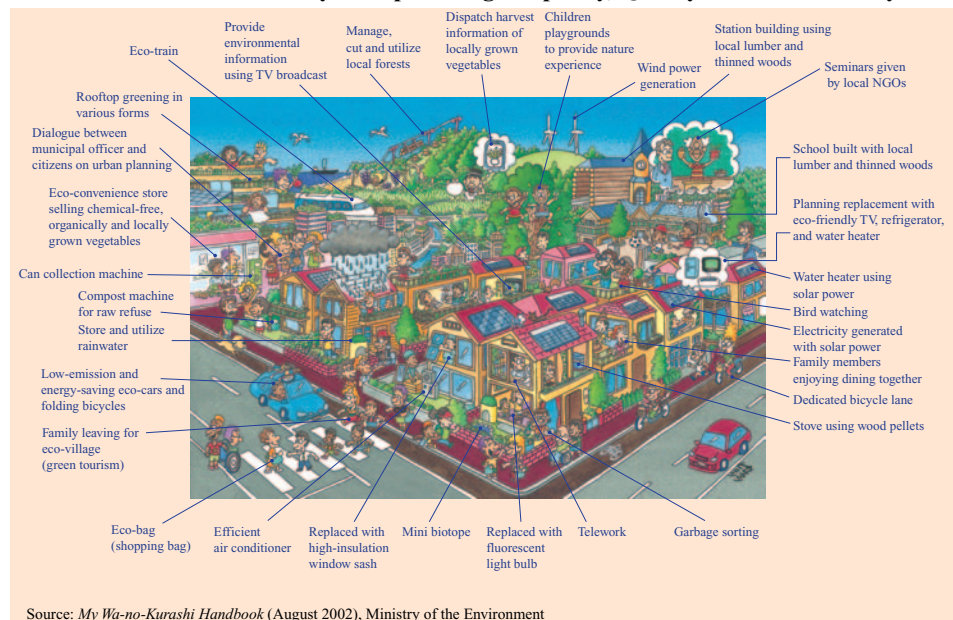
Changes in Lifecycle Energy by Category



Food Mileage of Imported Food Products (Per capita estimate)



Wa-no-Kurashi—Lifestyle Emphasizing Simplicity, Quality and Sustainability



Global Warming Measures by Individuals

If each family implemented the following activities, a 2.8% reduction in greenhouse gas emissions in Japan would be realized (compared to the 1990 level).

(CO₂ equivalent)

	Measures	Annual CO ₂ reduction per household	Emission reduction to the total emission per household per year (%)	Annual savings per household	Remarks
1	Raise air conditioner settings by 1 and lower heater settings by 1	Approx. 31 kg/year	0.5%	Approx. 2,000 yen/year	Use curtains to control the amount of sunlight; adjust the amount of clothing worn; do not depend on the air conditioner and heater; and put off using the air conditioner and heater as long as possible.
2	Reduce driving distances 8 km twice a week	Approx. 185 kg/year	3.1%	Approx. 8,000 yen/year	When commuting or going shopping, use bus, rail, or bicycle. Walking and riding a bicycle are also good for health.
3	Stop the engine during idling for 5 minutes a day	Approx. 39 kg/year	0.7%	Approx. 2,000 yen/year	When parking or stopped for an extended time, turn off the engine. It also contributes to reducing the emission of air pollutants.
4	Reduce standby electricity consumption by 90%	Approx. 87 kg/year	1.5%	Approx. 6,000 yen/year	Turn off main power. When not using for a long period, unplug the electric cord. When buying new products, select one with lower standby power consumption.
5	All family members reduce shower time 1 minute per day	Approx. 65 kg/year	1.1%	Approx. 4,000 yen/year	Turn off shower when washing.
6	Use leftover bath water for the laundry	Approx. 17 kg/year	0.3%	Approx. 5,000 yen/year	Some use the leftover bath water to water the garden or in the toilet in addition for laundry. Commercially available pumps make it easy to use the bath water.
7	Don't use warming feature of electric rice cookers/warmers and electric pots	Approx. 31 kg/year	0.5%	Approx. 2,000 yen/year	The warming feature of electric rice cookers and electric pots is used over long periods of time and consumes a lot of electricity. Warming the rice in the microwave will reduce electricity use.
8	Reduce heating and lighting by 20% by having the entire family in one room	Approx. 240 kg/year	4.1%	Approx. 11,000 yen/year	When family members are in different rooms, excessive lighting and heating are necessary.
9	Carry a shopping bag; choose minimally packaged vegetables	Approx. 58 kg/year	1.0%		When trays and wrapping are carried home, they are soon thrown away. Reduce receiving plastic grocery bags at the register by carrying a shopping bag.
10	Select TV programs and reduce TV viewing 1 hour per day	Approx. 13 kg/year	0.2%	Approx. 1,000 yen/year	Watch only the selected TV programs.
	Total	Approx. 766 kg/year	13.0%	Approx. 41,000 yen/year	
	Total effect in Japan	Approx. 34.7 million tons/year	2.8% reduction of greenhouse gas emissions in Japan (compared to the 1990 level)		

Notes:

1. Annual per household CO₂ emissions: approx 5,900 kg; Number of households in Japan: 47.42 million (1999); Number of passenger cars in Japan: 40 million

2. Method of calculating the total effects in Japan: emissions reduction from automobiles (2 and 3 of the above measures) x 40 million (cars) + all other emissions reduction measures x 47.42 million (households) = 34.7 million tons

Source: *Personal Measures against Global Warming: 10 Things a Family Can Do*, Ministry of the Environment

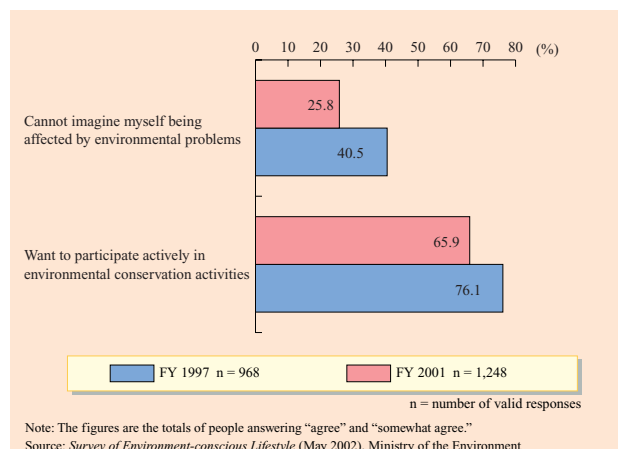
Section 3: Great Possibility Arising from Individual Efforts

1. Gap between the Awareness on Environmental Problems and Concrete Actions

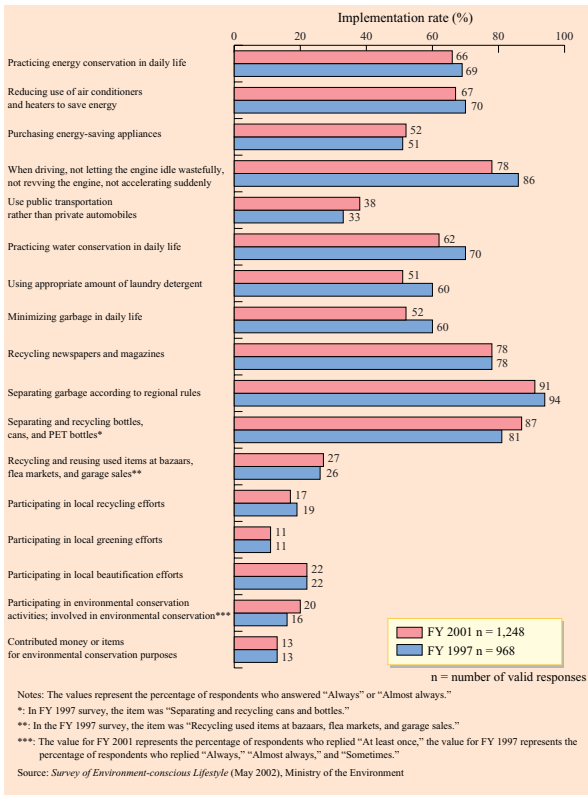
More and more people are seeing environmental problems as their own concerns and are saying that “citizens” are the important actors in environmental conservation efforts. This shows that people’s awareness on environmental problems has heightened.

In terms of concrete actions, while environmental conservation activities being done as a rule (sorting waste, recycling of newspapers and magazines, etc.) and those that have direct economic benefits (conserving electricity and saving energy when using air conditioner and heater, etc.) are carried out, participation in activities in which the results are not directly observable—such as donations to

Opinions on Environmental Problems



Implementation Status of Environmental Conservation Activity



environmental conservation organizations and participation in local greening activities, local beautification activities and the activities of environmental conservation organizations—is still comparatively low. This shows that the heightened awareness of environmental problems does not lead to actual environmental conservation activities.

According to the result of an international joint survey on environmental problems, the fact that the heightening of awareness does not lead to active participation in environmental conservation activities is mainly due to the perception that individual actions cannot contribute much to the solution of environmental problems.

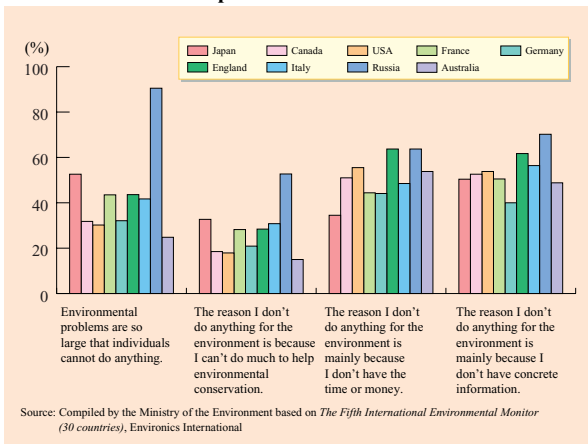
2. Changes in Individuals that Prompt Actions

An individual goes through several steps before taking concrete actions to protect the environment. The first step is to become aware of environmental problems and to become interested. The next step is to understand the close cause-and-effect relationship between the environmental problems and our daily activities. The final step is the realization that one's actions can provide various solutions and the taking of initiative to build capacity for solving the problem. Environmental education and learning and environmental information play an important role in facilitating the advancement in these steps.

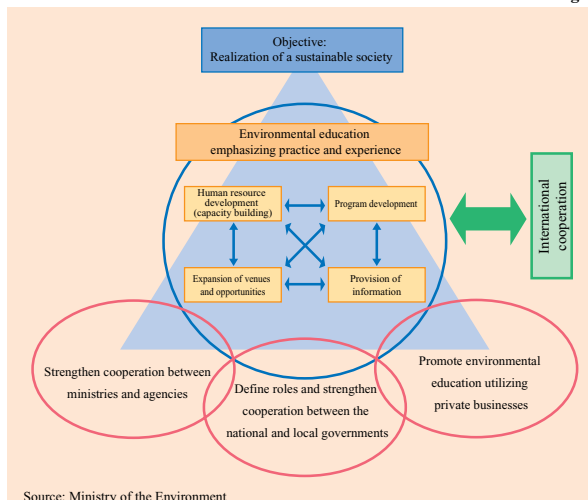
A report from the Central Environment Council presented eight approaches for promoting environmental education and learning policies. The report points out that implementation of the following four of the eight approaches can facilitate the promotion of environmental education and learning with emphasis on actual practices and experiences: (1) capacity building—establishing a human resource development system to cultivate diverse human resources with knowledge and techniques to gain the impetus for progress, (2) program development—creating venue-specific and topic-specific programs so that they lead to actual actions, (3) information provision—gathering information to create a database for environmental education and to systematically accumulate information of various actors, and (4) expansion of opportunities and venues—creating opportunities and venues where people can actually experience environmental conservation activities. Because environmental education and learning are important means for promoting actions for the realization of a sustainable society, it becomes increasingly important to ensure the effectiveness of environmental education and learning.

In terms of environmental information, the more

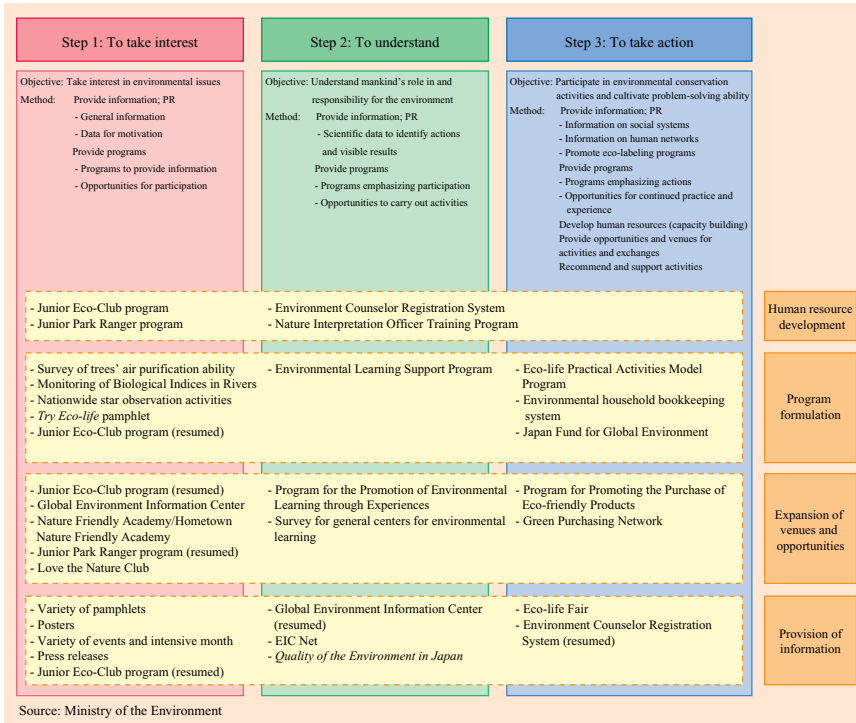
International Comparison of Environmental Awareness



Measures for the Promotion of Environmental Education and Learning



Steps for Concrete Actions and Policy Implementation

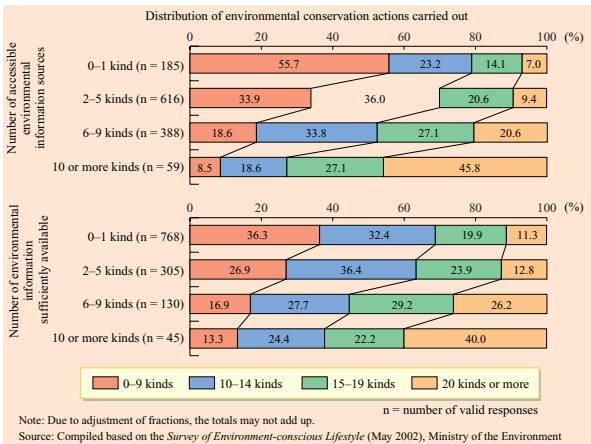


numerous the information sources are and the more substantial the information is, the easier it becomes to facilitate environmental conservation activities. Therefore, a system must be developed to enable the gathering of environmental information, when needed in the format required, such as eco-labeling and green purchasing related information.

3. Individual Efforts Cumulate into a Tremendous Force

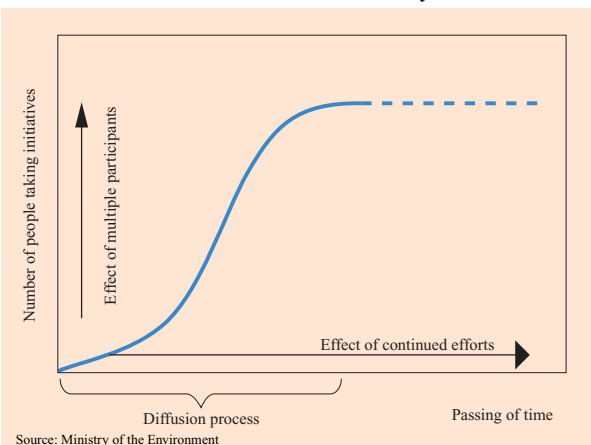
Dr. Everett Rogers, an American sociologist, put forward a generalized theoretical model of the process of innovation adoption that shows how new technologies and

Influence of Environmental Information on Behaviors



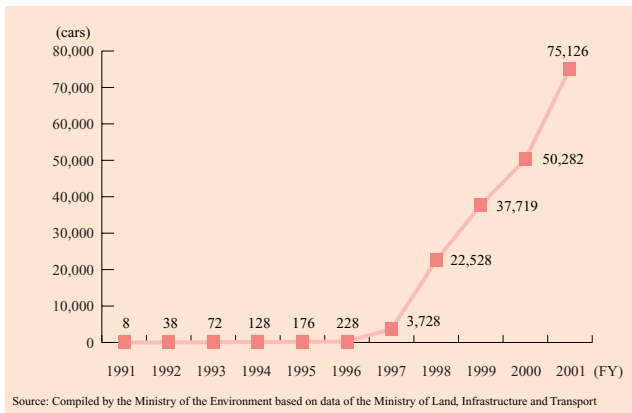
products are launched in the market and gain acceptance by society. Rogers' model of innovation adoption can be applied to environmental conservation measures such as the purchase of environment-friendly products, including hybrid vehicles, refillable detergents, and products with replaceable parts. When a product fulfills the factors of diffusion such as "obvious environmental conservation effect," "same economical efficiency and functionality as conventional products," "easy application," "trial use possible," and "visible results," more and more people will adopt its use as time goes by. In this way, an individual's action will spread to other people. The completion of the diffusion process means multiple users are contributing in creating an effect, which in turn, when coupled with the continuous effect of the action, will evolve into a common mode of behavior in individuals, thus creating a tremendous impact.

Diffusion of Initiatives Undertaken by Individuals

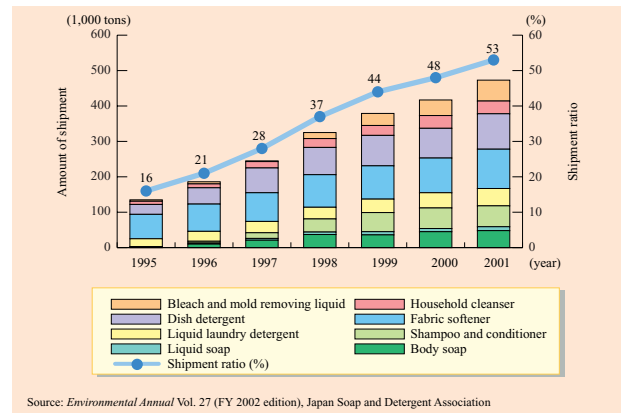


Many environment-friendly products are still in the process of adoption. In order for these products to make further inroads, corporations must develop new technology and design environment-conscious products, and the government must establish a framework and create institutions to assist individual actions so that everyone will continue to select environment-friendly products. The self-initiated and proactive efforts of individuals are the starting point that will bring forth these actions of businesses and government agencies. By each actor influencing other actors and creating a social environment that facilitates environmental conservation activities, such efforts will spread nationwide, creating a remarkable force as a result.

Changes in the Ownership of Hybrid Vehicles



Changes in the Shipment of Refillable Products



Section 4: Changes in the Socio-economic System Arising from the Interaction between Individuals and Other Actors

1. Relationship between Individuals and Businesses

The increased awareness of environmental conservation in recent years has made businesses more responsive to environmental problems. While businesses actively make social contributions in the environmental field, businesses also tend to incorporate environmental considerations into business activities, such as formulating environmental management policy and setting up specific environmental goals and targets. Furthermore, green businesses are also on the rise. It had a market size of 29.9 trillion yen in 2000 and is expected to reach 47.2 trillion yen in 2010 and 58.4 trillion yen in 2020. During this period, the green business workforce is estimated to increase from 769,000 persons to 1.119 million in 2010 and 1.236 million in 2020.

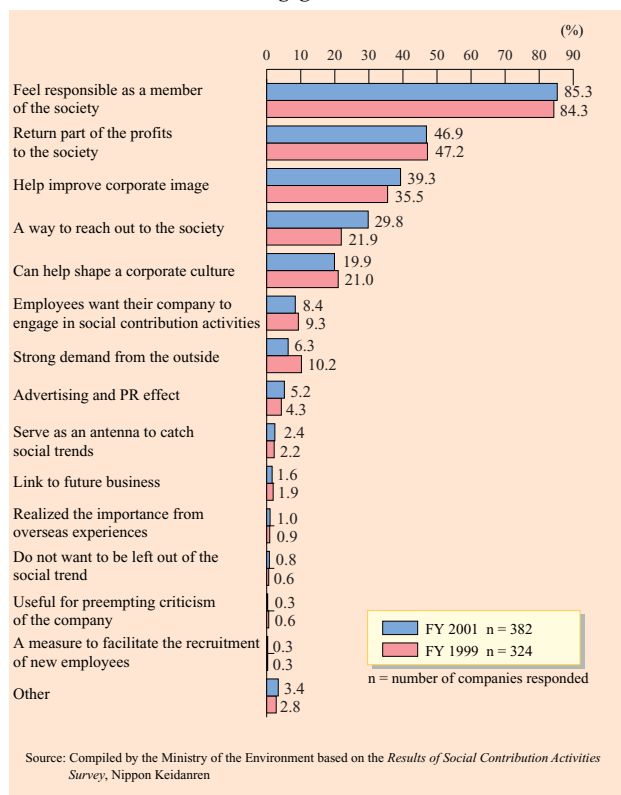
Against this backdrop, we can view that proactive measures taken by businesses, such as to supply environment-friendly goods and services and environmental information, and to provide environmental education and learning, lend a great deal of support to the actions of individuals.

For example, eco-labeling represented by Eco Mark is an important source of information for consumers to enable them to exercise consideration for the environmental load of products and select products and services with a smaller environmental load. In tandem with the rapid popularization of green purchasing and procurement, the number of products with such eco-labeling is on the rise.

Due to the fact that the “purchase of a product” is often to “acquire the function” of that product, a business model called “servicizing” which delivers the function of a product is gaining popularity. For example, car-sharing businesses in which members share the use of vehicles are making inroads everywhere. Such services not only directly lower environmental load but also are expected to bring forth a reexamination of our overall lifestyle through changing the way vehicles are owned and used because they account for a great portion of household spending.

Various stakeholders evaluate businesses from multiple aspects, including the environmental aspect. Businesses are starting to realize the importance of environmental communication. A growing number of businesses are taking initiatives to provide information through the Internet, compile and publish environmental reports, adopt environmental accounting, etc.

Reasons for Businesses to Engage in Social Contribution Activities



Estimation of the Current and Future Market Sizes and Workforce of Japan's Green Businesses

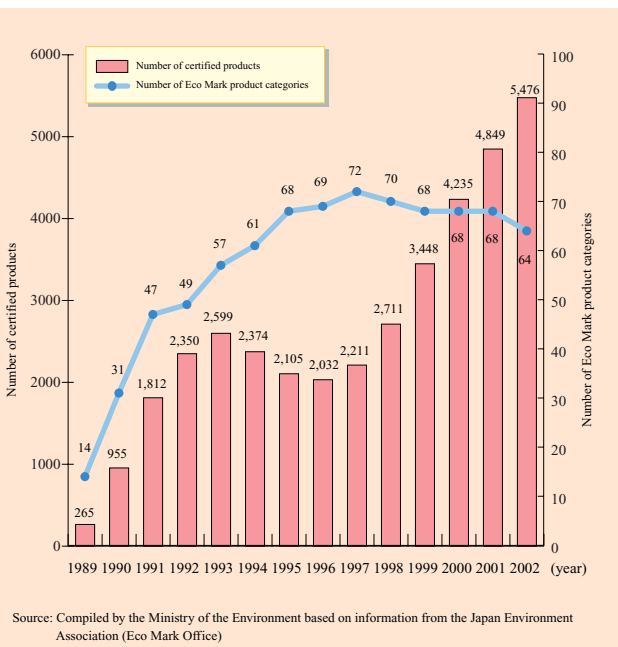
Green business	Market size (100 million yen)			Workforce (persons)		
	2000 (*)	2010	2020	2000	2010	2020
A. Environmental pollution control	95,936	179,432	237,064	296,570	460,479	522,201
Manufacturing of equipment and materials for the prevention of pollution	20,030	54,606	73,168	27,785	61,501	68,684
1. Prevention of pollution	5,798	31,660	51,694	8,154	39,306	53,579
2. Treatment of effluent	7,297	14,627	14,728	9,607	13,562	9,696
3. Treatment of waste	6,514	7,037	5,329	8,751	6,676	3,646
4. Purification of soil and water (including groundwater)	95	855	855	124	785	551
5. Prevention of noise and vibration	94	100	100	168	122	88
6. Environmental measurement, analysis, and assessment	232	327	462	981	1,050	1,124
7. Other	-	-	-	-	-	-
Provision of services	39,513	87,841	126,911	238,989	374,439	433,406
8. Prevention of air pollution	-	-	-	-	-	-
9. Treatment of effluent	6,792	7,747	7,747	21,970	25,059	25,059
10. Treatment of waste	29,134	69,981	105,586	202,607	323,059	374,186
11. Purification of soil and water quality (including groundwater)	753	4,973	5,918	1,856	4,218	4,169
12. Prevention of noise and vibration	-	-	-	-	-	-
13. Environmental research and development	-	-	-	-	-	-
14. Environmental engineering	-	-	-	-	-	-
15. Analysis, data collection, measurement, and assessment	2,566	3,280	4,371	10,960	14,068	17,617
16. Education, training, and provision of information	218	1,341	2,303	1,264	5,548	8,894
17. Other	50	519	987	332	2,487	3,481
Construction, and installation of equipment	36,393	36,985	36,985	29,796	24,539	20,111
18. Equipment for the prevention of air pollution	625	0	0	817	0	0
19. Equipment for treating effluent	34,093	35,837	35,837	27,522	23,732	19,469
20. Facilities for treating waste	490	340	340	501	271	203
21. Equipment for purifying soil and water	-	-	-	-	-	-
22. Equipment for preventing noise and vibration	1,185	809	809	956	536	439
23. Equipment for environmental measurement, analysis, and assessment	-	-	-	-	-	-
24. Other	-	-	-	-	-	-
B. Environmental load reduction technologies and products (manufacturing of equipment and provision of technologies, materials, and services)	1,742	4,530	6,085	3,108	10,821	13,340
1. Environmental load reduction and resource conservation technologies and associated processes	83	1,380	2,677	552	6,762	9,667
2. Environmental load reduction and resource conservation products	1,659	3,150	3,408	2,556	4,059	3,673
C. Efficient use of resources (manufacturing of equipment, provision of technologies, materials, and services, construction, and installation of equipment)	201,765	288,304	340,613	468,917	648,043	700,898
1. Prevention of indoor air pollution	5,665	4,600	4,600	28,890	23,461	23,461
2. Water supply	475	945	1,250	1,040	2,329	2,439
3. Recycled materials	78,778	87,437	94,039	201,691	211,939	219,061
4. Facilities for renewable energy	1,634	9,293	9,293	5,799	30,449	28,581
5. Energy conservation and energy management	7,274	48,829	78,684	13,061	160,806	231,701
6. Sustainable agriculture and fisheries	-	-	-	-	-	-
7. Sustainable forestry	-	-	-	-	-	-
8. Prevention of natural disasters	-	-	-	-	-	-
9. Eco-tourism	-	-	-	-	-	-
10. Other (nature protection, ecological environment, biodiversity, etc.)	107,940	137,201	152,747	218,436	219,059	195,655
Total	299,444	472,266	583,762	768,595	1,119,343	1,236,439

Notes:

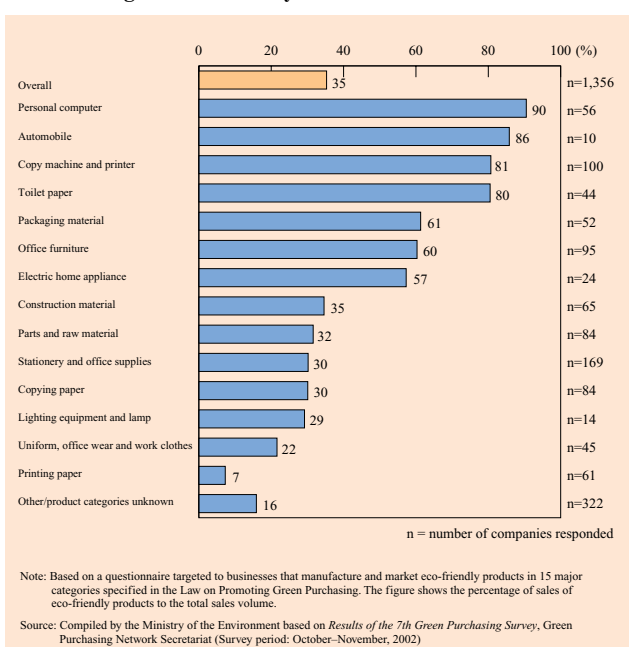
1. "-" indicates no data available.
2. Some figures under FY 2000 market size are not from the same fiscal year.
3. Some totals under market size may not add up due to rounding.

Source: Ministry of the Environment

Changes in the Number of Eco Mark Certified Products



Percentage of Eco-friendly Products to Total Sales Volume



Major Car-sharing Examples in Japan

Name	Feature	Car type	Area	
CEV Sharing	- Japan's first car-sharing business run by a private company - Participated by citizens and businesses (started operation since 2002)	- Low emission car	Yokohama City	In practical use
Car Sharing Network	- Japan's first car-sharing business run by specified non-profit corporation - Participated by citizens and businesses (started operation since 2002)	- Low emission car	Fukuoka City	
Social Experiment on Automotive Transport Fujisawa 2001	- Citizens who commute to train stations by car and businesses that use cars in daytime operations share low-emission vehicles - Co-workers carpool from train stations to the company (2001–March 2002)	- Conventional gasoline-powered car - Low emission car	Fujisawa City (Kanagawa Prefecture)	Experimental stage
Kyoto Public Car System	- Set up stations at seven locations in the city's business, residential and tourist districts - Tourists, citizens and business operators are monitoring members (FY 2000–2002)	- Low emission car	Kyoto City	
Electric Truck Sharing System	- Experiment to share electric trucks for business use - Participated by 80 corporations (December 1999–March 2000)	- Low emission car	Osaka City	
Ebina City Eco Park-and-ride	- Citizens using low-emission cars to commute to work park their cars at parking lots near stations, and businesses in the neighborhood use the cars in daytime for business purposes - Park-and-ride car-sharing method utilizing difference in the time of car use (January–March 2000, November 2000–March 2001)	- Low emission car	Ebina City (Kanagawa Prefecture)	
Electric Car Joint Use Experiment	- In cooperation with car manufacturers, businesses and citizens share low-emission vehicles - About 110 individual members and 18 corporate members (FY 2000–)	- Low emission car	Toyota City (Aichi Prefecture)	

Source: Ministry of the Environment

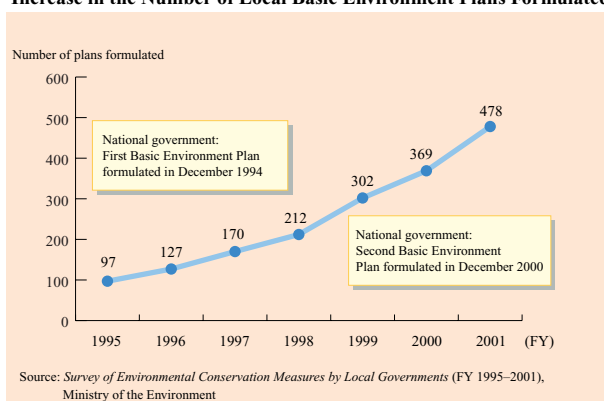
On the other hand, the active approach of individuals towards businesses adds momentum to the environmental activities pursued by businesses. For example, in addition to a rising interest in the purchase of environment-friendly products in recent years, networks are formed to respond to the needs of these consumers. Coupled with the recognition of businesses for their excellent environmental conservation activities and the appearance of eco-funds, there are movements to evaluate and rank businesses from an environmental point of view, to provide information on the environmental management of companies in job information magazines, etc. All of these factors together will change corporate behavior and eventually transform the socio-economic system into one that is more considerate of the environment.

2. Relationship between Individuals and the Government

The government is an actor who sets up the framework and establishes the foundation of the socio-economic system and influences the action of individuals. Recently, local governments have begun incorporating the role of each citizen into their local basic environment plans, pointing out the need for citizens to change their lifestyles and to pursue environment-conscious way of living. Taking the opportunity of the introduction of local discretionary taxation system for specific purposes, some local governments have introduced environment-related taxes to promote environmental considerations in various aspects of daily life, such as actions that give consideration to conservation of the natural environment, reduction in the use of plastic grocery bags receiving at the cash register, etc. Furthermore, in response to the increase in environmental load that results from the rising demand for automobile use in daily life, the government is building social infrastructure to create an environment to facilitate the use of bicycles, to establish a park-and-ride system, etc. In addition, the government is also putting efforts in developing human resources that can offer specialized knowledge and rich experience, providing consolidated easy-to-use environmental information, and carrying out public relations activities.

On the other hand, especially at the local government level, it has become possible for individuals to participate actively in the formulation of environmental conservation measures. There are examples that the actions of individuals have influenced public administration, and that citizens and the government have joined forces in implementing such measures.

Increase in the Number of Local Basic Environment Plans Formulated



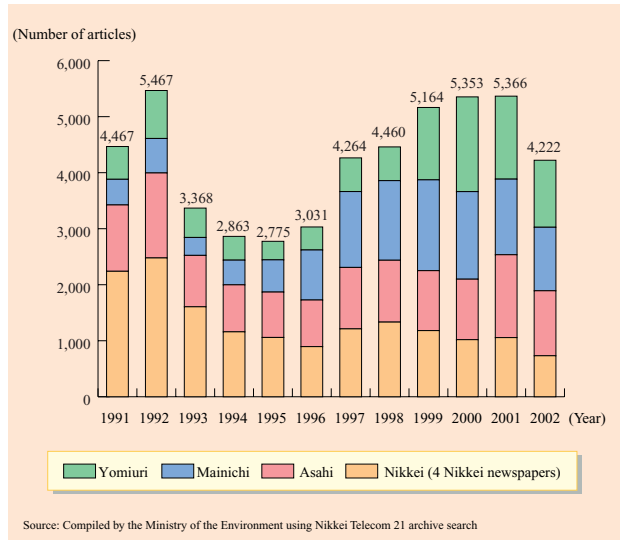
3. Relationship with Other Actors

Businesses and the government are not the only ones lending support to the efforts of individuals.

For example, the activities of environmental non-profit organizations (NPOs) provide venues for activities in areas closely related to the daily lives of individuals. By realizing the problems that exist in daily life and participating in NPO activities, it is hoped that individuals will help advance the activities of local communities and other actors. The diverse information dispatched by the mass media will help raise environmental awareness, give direction to the way daily activities are conducted, and expand the activity circles in daily life to the whole society. Furthermore, as every individual lives in relation to the people in the surrounding areas such as neighbors, acquaintances, friends and family members, it becomes possible to raise awareness or incorporate daily life measures through the exchange of information with these people.

In this way, the environmental conservation efforts of one individual will promote the activities of other actors, which will in turn stimulate the activities of other individuals, creating a cycle of rippling effect. This chain of movements will eventually accelerate the reformation of the lifestyle of every individual.

Changes in the Number of Newspaper Articles on Environmental Issues



Section 5: New Developments towards a Sustainable Society

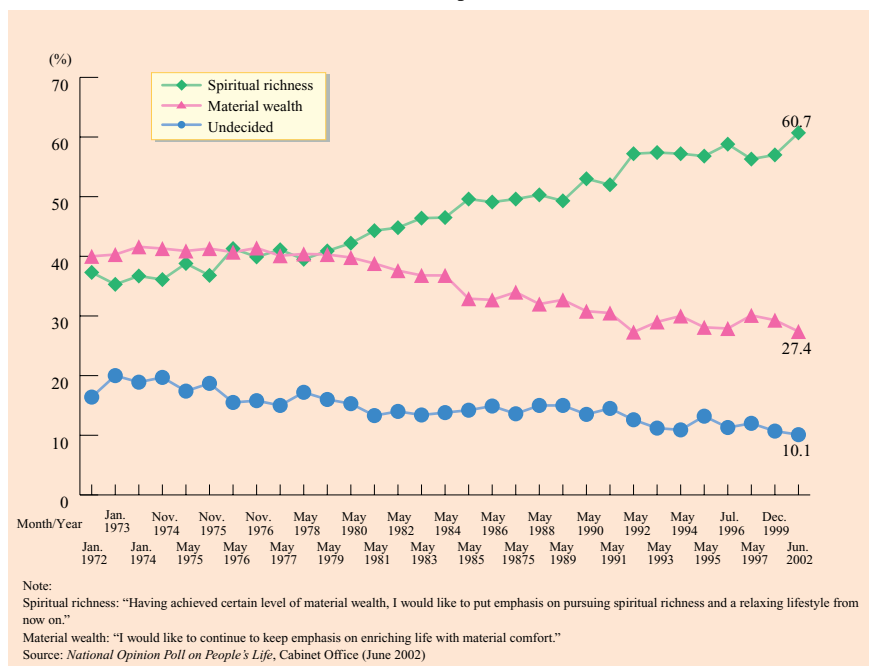
1. Key to the Building of a Sustainable Society

After the period of high economic growth, the number of people in search of spiritual richness rather than material wealth has been consistently on the rise. There is a tendency for people to place priority on an affluent and relaxing lifestyle, the pursuit of leisure activities, self-enlightenment and self-improvement rather than on durable consumer goods. Furthermore, the number of years before replacement of a durable consumer product has increased.

Against this backdrop, several new lifestyles have taken root recently.

For example, “simple life” has become a popular phrase representing a lifestyle that restores spiritual richness. Specifically, a person who is in pursuit of this type of lifestyle proposes the following: (1) leading a life that is surrounded by carefully selected items; (2) paying price in accordance with the value of goods while taking into consideration environmental concerns and possibility of long-term use; and (3) making extra efforts to use goods for a longer period through careful use, repairs and recycling. In order to diffuse this trend further, it is necessary for everyone to view such

Material Wealth or Spiritual Richness



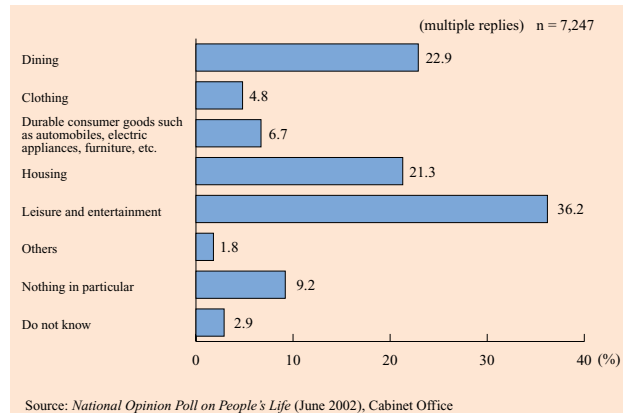
lifestyle as “attractive and cool.”

In addition, the “Slow Food” movement, a movement started in Italy in 1986 that reexamines the eating habit of modern man, is also gaining popularity in Japan. In recent years, as vegetables and other foods are not harvested during the harvesting season, food materials need to be grown in the heated green house and transported in large quantities to distant places where they are consumed. Such changes in eating habits have resulted in an increase in environmental load. The diffusion of the Slow Food movement, which promotes eating rice and local dishes, can reduce the burden on the environment.

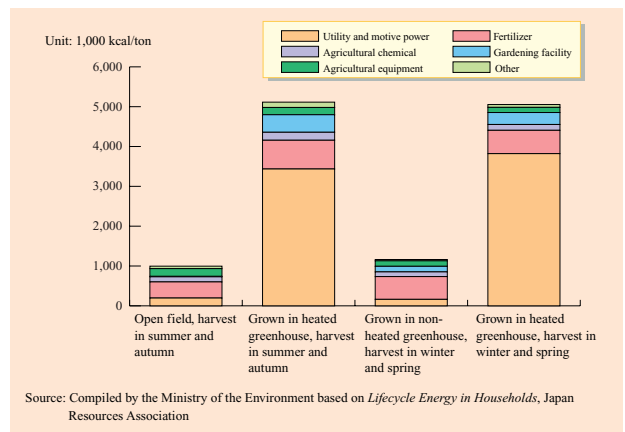
2. Steps towards a Sustainable Society

A socio-economic system must be established to enable everyone to choose a sustainable lifestyle. The socio-economic system must be reformed and the awareness and actions of individuals must also be changed at the same time. However, not everyone can take the same path to reach the goal. It is necessary to realize that the changes in awareness and action can create an impetus that can change society. Progress must be made with steady steps.

Areas Where Improvements are Desired



Amount of Energy Used for Growing Cucumbers (1990)



Chapter Two

Aiming at a Sustainable Society through Local Actions

<Summary of Chapter Two>

Local communities are closely intertwined with our day-to-day living. This is why we can see relatively easily the environmental load, its impact, and results that may be gained by taking actions. Therefore, the community is a place where we can obtain a comparatively good grasp of environmental issues and make voluntary efforts to conserve the environment. This chapter describes the conditions necessary to make our efforts in local communities effective, and how such endeavors help reinvigorate the area and become the driving force behind a shift toward a sustainable society.

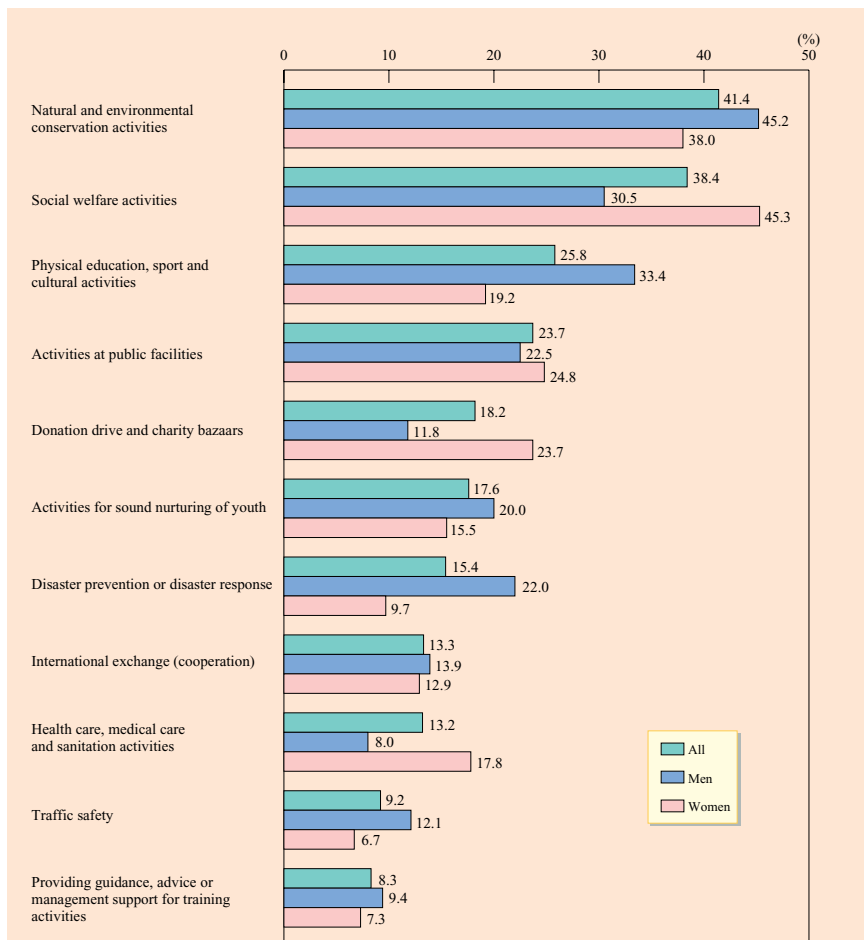
Section 1: Environmental Conservation Efforts in Local Communities

1. Environmental Conservation Efforts Being Active in Local Communities

People are placing greater emphasis on spiritual richness and becoming increasingly interested in contributing to society. Against this backdrop, signs have pointed to a growing movement in the environmental arena to go beyond just practicing environmental conservation measures in one's daily life to becoming more involved in environmental conservation efforts through volunteer activities and participation in NPO activities, neighborhood associations and community associations. Many such activities are characterized by their orientation toward community-level endeavors to improve the immediate surroundings or to be active in the neighborhood.

Likewise, businesses, their trade associations, consumers' cooperatives and agricultural cooperatives have begun to show a growing interest in local communities. Motivated by the idea that fulfilling social responsibilities helps earn higher public esteem, many of these businesses have begun voluntary

Preferred Volunteer Activities



Notes:

1. The results are taken from the respondents that replied "Yes" or "If I have a chance" to the question "Do you want to participate in volunteer activities?" The percentage is the ratio of responses (multiple responses) in answer to the question "Of the following activities, which would you like to participate in? Please select all that apply."

In addition to the above choices, 1.5% answered "Other" and 1.2% did not answer.

2. There were 2,580 respondents.

Source: FY 2000 Survey on National Lifestyle Preferences (December 2000), Cabinet Office

environmental conservation efforts and to work toward reducing the environmental load from their business activities.

In recent years, various actors have become increasingly active in community-based environmental conservation activities.

2. Historical Development of Environmental Conservation Activities in Local Communities

From the middle of the Meiji era to the early Showa era, measures against mine pollution were limited to out-of-court settlements, compromise or relocation of the injured party. Pollution was treated as a local issue, confined to specific areas.

As pollution spread across Japan during the period between 1945 and 1965, antipollution campaign organizers in different areas came to cooperate and it made the entire nation realize that drastic pollution control measures were needed along with economic growth. At that time, local antipollution initiatives played a leading role on the pollution control front, as exemplified by the enactment of pollution control ordinances by local governments.

As urban and domestic pollution became more noticeable in the decade following 1975, the traditional pattern of local residents confronting industries shifted to a movement to review the environmental load for which residents themselves were responsible. One such example was the Citizen Campaign for Using Soap Instead of Synthetic Detergent initiated by residents in adjacent areas of Lake Biwa. Japan at that time required not only pollution prevention efforts but also measures to increase the amenities provided by the local environment. This decade witnessed the introduction of the national trust movement that originated in England. The movement purchases land to be preserved with money collected from a broad base of citizens through fund-raising campaign.

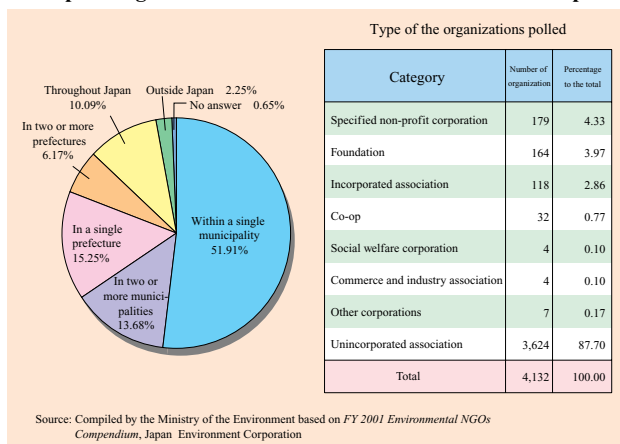
Since 1985, the issues of waste, recycling and the global environment have become a major concern, and there has been a growing public awareness that voluntary efforts at a community level is vital because the cause and solution of environmental problems are linked directly to the life of an individual. There has also been a surge in cases where different actors in the area make united efforts to tackle waste and recycling problems. Partnerships were formed between cities and agricultural villages mediated by material circulation. Also, programs that seek to improve the environment and work toward a sustainable society have gained momentum.

When we look back on the history of local environmental conservation efforts in Japan, it is apparent that local initiatives have played a pivotal role in the nation's efforts to conserve the environment.

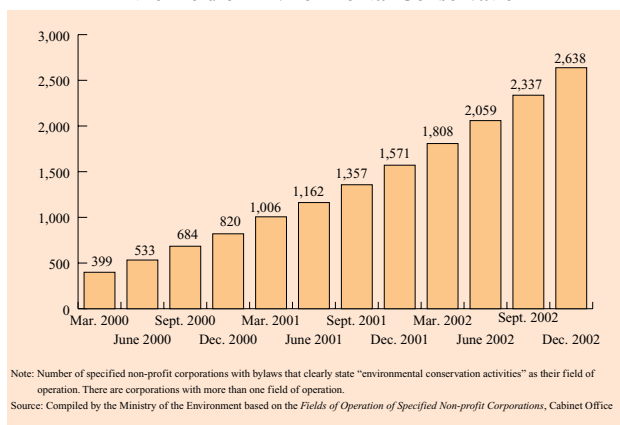
3. Internationally Mandated Local Efforts (from “Local Agenda” to “Local Action”)

Agenda 21, adopted at the 1992 Earth Summit, mandated local governments to formulate a Local Agenda 21, an action plan to achieve a sustainable society. The Johannesburg Summit held in 2002 issued a declaration to promote Local Action 21 to translate the measures adopted by Local Agenda 21 into specific actions. This adoption attests to the international recognition of the importance of initiating actions in local communities, on a daily-life level.

Operating Areas of Environmental Conservation Groups



Number of Specified Non-profit Corporations Working in the Field of Environmental Conservation



Chronology of Events Related to Environmental Conservation Efforts

Year	Events	Orientation of activities
1887–1906	• Copper poisoning incident occurred at Ashio copper mine	Protest against industrial pollution
1951	• Deterioration of water quality in areas surrounding paper mill factories began to attract public attention	
1955	• First case of “Itai-itai” disease was reported at a medical convention	
1956	• First case of Minamata disease was reported to a health office	
1958	• Melee broke out between fishermen and the factory over damage to fishing operation caused by drainage of effluent from a paper mill factory to Edogawa River	
1963	• Campaign against the construction of Mishima Industrial Complex was launched	
1964	• Pollution control agreement was concluded between Yokohama City and businesses	
1965	• Outbreak of Minamata disease in the Aganogawa River downstream region was officially affirmed	
1967	• Yokkaichi Pollution Lawsuit was filed	
1969	• Lawsuit against noise of Osaka International Airport was filed	
1970	• First warning of photochemical smog was issued in Sugunami Ward, Tokyo	
1970	• Residents and businesses signed a pollution control agreement in Iwaki City, Fukushima Prefecture	
1970	• Pollution May Day rally was held (consisting of meetings and demonstrations in 16 prefectures across the nation; first united action by citizens’ groups)	
1973	• Suit demanding suspension of the construction of Buzen thermal power plant was filed	
1974	• National Liaison Council for Shinkansen Noise Pollution was inaugurated	
1975	• Citizen Campaign for Using Soap Instead of Synthetic Detergent was launched	
1976	• Kawasaki City enacted the ordinance regarding environmental impact assessment	
1977	• A 1977 OECD report—Environmental Politics in Japan—reviewed that “Japan has won many pollution abatement battles, but has not yet won the war for environmental quality.” (It was suggested that Japan needs to make aggressive efforts to improve environmental comfort (amenity), in addition to working toward pollution prevention.)	
1979	• Ordinance concerning the prevention of eutrophication of Lake Biwa in Shiga Prefecture was enacted.	Efforts directed toward resolution of domestic pollution and improvement of amenity
1981	• Ordinance concerning the prevention of eutrophication of Lake Kasumigaura in Ibaraki Prefecture was enacted	
1982	• First National Trust Symposium was held in Shari-cho Town, Hokkaido.	
1983	• Conference on Studded Tire Pollution was held in Sendai City	
1984	• Chemical substances were detected in wells in the vicinity of the final landfill site in Hinode-machi Town, Tokyo	
1987	• 20% Club for Sustainable Cities was created	
1987	• Caring for Tenjinzaki Foundation was established and certified as designated public interest corporation (natural environment conservation) by governor of Wakayama Prefecture.	
1988	• Desalination project of Lake Nakaumi-Lake Shinjiko was frozen	
1988	• National Amenity Council was inaugurated	
1988	• Ordinance concerning the Promotion of Natural Ecosystem Agriculture (organic farming) was enacted in Aya-cho Town, Miyazaki Prefecture	
1989	• Light Pollution Control Ordinance was enacted in Bisei-cho Town, Okayama Prefecture	
1990	• International Council for Local Environmental Initiatives (ICLEI) was established	
1990	• Environment Co-operative Union Shiga (Eco-Coop BIWAKO) was established	
1991	• Community study were started in Minamata City, Kumamoto Prefecture	
1992	• Coalition of Local Government for Environmental Initiative, Japan was established	
1992	• Agenda 21 was adopted at Earth Summit	
1993	• Kanagawa Prefecture drew up Japan’s first Local Agenda 21	
1993	• Groundwork Mishima was established (Mishima City, Shizuoka Prefecture)	
1993	• First Tramway Summit was held (Sapporo City, Hokkaido)	Collaborative partnerships aimed to solve global environmental problems
1995	• Organization for Minamata disease patients accepted the government’s final settlement proposal	
1995	• Kita Ward, Tokyo and Kanra-machi Town in Gunma Prefecture commenced collaboration in food recycling	
1995	• First Summit of Terraced Paddy Field was held (Yusuhara-cho Town, Kochi Prefecture)	
1996	• Community Action Network for Preserving the Akame Forest was established (Nabari City, Mie Prefecture)	
1996	• Tachikawa-machi Town, Yamagata Prefecture formulated a plan for new energy introduction (wind power generation, etc.)	
1996	• Asahi-machi Town, Yamagata Prefecture formulated Eco Museum Design and Construction Plan	
1997	• Hokkaido introduced “Time Assess”	
1999	• EcoMoney Network was established	
1999	• National Recycling Shopping Area Summit was held (Waseda, Shinjuku Ward, Tokyo)	
2000	• Tokyo Metropolitan Government launched “No Diesel Vehicle” campaign	From after-the-fact relief to prevention; From confrontation to collaboration; From environmental conservation to environmental creation; From local to global
2000	• Forest improvement agreement was concluded (Kumamoto City and Yabe-machi Town, Kumamoto Prefecture)	
2001	• Mie Prefecture enacted the Ordinance for industrial waste tax	
2002	• Tokyo’s Sugunami Ward enacted Sugunami Environmental Tax (Plastic Grocery Bag Tax) Ordinance	
2002	• Johannesburg Summit called for the implementation of Local Action 21	

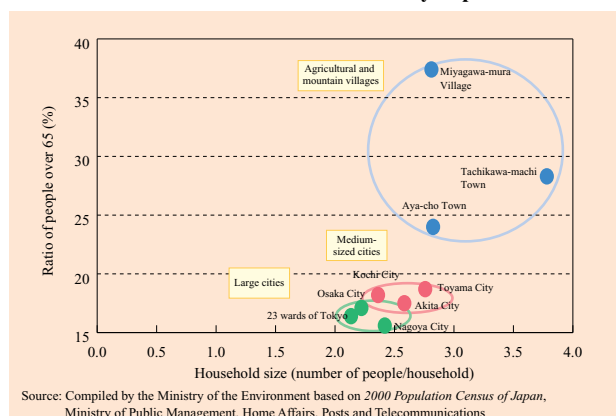
Source: Compiled by the Ministry of the Environment based on: *Environmental Information Science*, Volume 25, No. 3 (September 1996), Center for Environmental Information Science; *Environmental Sociology* by Nobuko Iijima; *Strategies for Creation of Local Governments for Environmental Initiatives*, Mitsuru Tanaka, et al (September 2002); *Global Net*, No. 130, Global Environment Forum.

Section 2: Local Characteristics Defined by Actors and Infrastructure Comprising Local Communities

1. Local Characteristics and Infrastructure Comprising Local Communities

A community is comprised of nature-derived elements (e.g., climate, geography, fauna and flora, and water) and social elements (e.g. population, land use, transportation infrastructure, public facilities, tradition and culture). The relationship between these elements and the environment differs by community. For example, a tendency toward fewer members per household in urban areas results in an increase in energy and water consumption, whereas agricultural and mountain villages are more likely to have rich, multi-functional forest resources that supply timber and fix

Household Size and Ratio of Elderly Population



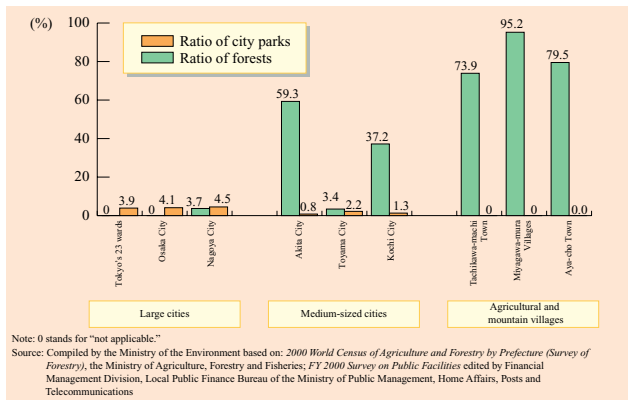
carbon dioxide. These rural communities also tend to generate a smaller amount of waste per capita per day. Differences like these results in diversification in the vision for the future that each community pursues. For instance, the concept of a “compact city” has been proposed for urban communities. This concept aims to bring one’s residence and place of work closer together by distributing urban functions at an appropriate density within a certain area. On the other hand, the concept of an “eco-village”—a community primarily emphasizing a harmonious coexistence with the environment, local

Structure of the Community Infrastructure

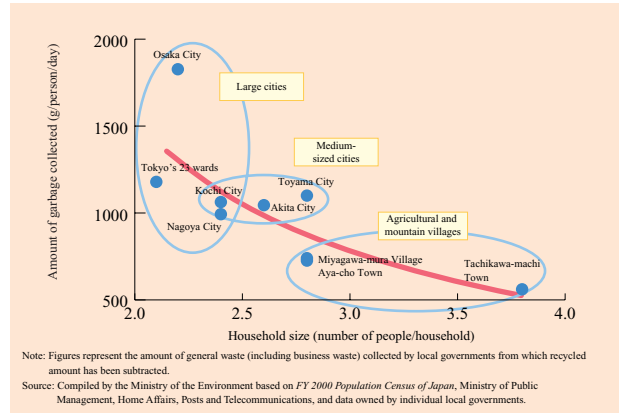
Broad classification	Medium classification	Narrow classification
Natural infrastructure	Climate	Temperature; Sunshine; Rainfall and snowfall; Wind; Tidal current
	Geography	Geographical features; Longitude and latitude; Topography; Altitude; Terrain roughness; Volcanoes; Hot springs; Geological features; Soil; Underground resources
	Fauna and flora	Natural monuments; Rare species; Regional endemic species; Primeval forests; Secondary forests; Natural grassland; Artificial forests; “Satochi-satoyama”; Agricultural land
	Atmosphere	Environmental air quality; Fragrance; Sound environment
	Water	Water quality; Groundwater; Surface water; Lakes and reservoirs; Oceans
	Natural amenity	Scenic beauty; Landscapes; Accessibility to water
	Social infrastructure	Population
City form and land use		Urban planning; Central urban district; Densely inhabited district population;
Transportation infrastructure		Green coverage rate; Agricultural land Roads; Bikeways; Sidewalks; Railroads; Tramways; Route buses; New transportation system; Ships
Domestic infrastructure		Water supply system; Waste water reuse system (rainwater, treated sewage); Sewage system; Agricultural community effluent treatment facilities; Combined household water treatment facilities; District heating and cooling
Waste disposal		Amount of waste generated; Recycling rate; Waste treatment facilities; Final landfill sites; Recovery and recycling systems
Industry and Economy		Industrial structure; Local industries; Environmental industry; Shopping areas
Building		Houses; Offices; Office buildings
Cultural facilities		Cultural halls; Community centers; Libraries; Plazas; Parks
Educational facilities		Schools; Institutions of higher education; Schools for development of occupational skills; Community colleges
Technology and Information		Technology; Skills; Intellectual property; Know-how; Wisdom
Tradition and culture		Traditional culture; Performing arts; Folktales; Festivals; Customs; Dialects
Historical background		Historical monuments; Cultural assets and buildings of historic significance; Historical events (with or without incidence of pollution); Persons of distinction and prominence

Source: Ministry of the Environment

Ratio of Forests and City Parks to Total Area (FY 2000)



Household Size and Per Capita Amount of Garbage Collected Daily (FY 2000)

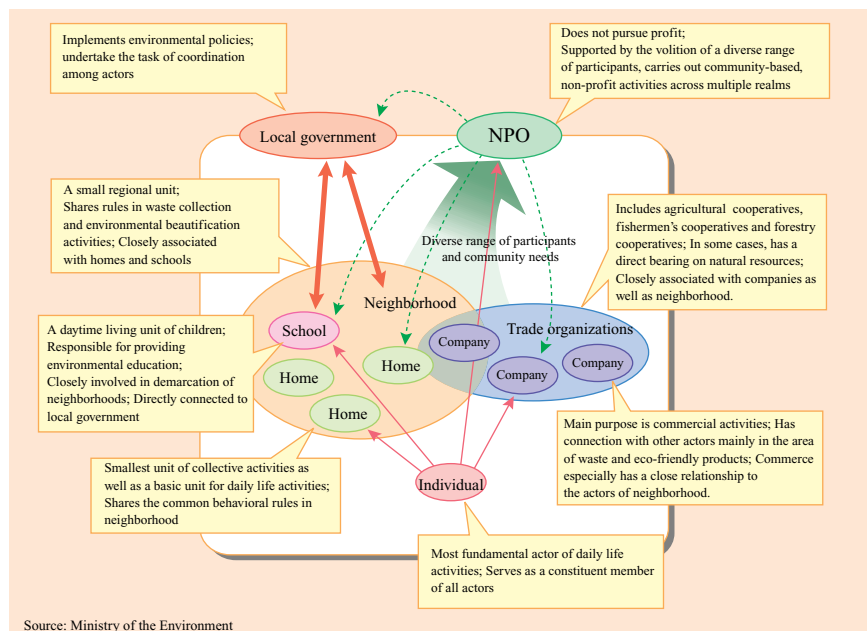


material circulation, and autonomy—has been proposed for agricultural and mountain villages so that the sustainability of these areas may be maintained.

2. Actors Comprising the Community and Their Roles

The community is made up of many different actors—individuals, homes, neighborhoods, schools, businesses, local governments and NPOs—that engage in social and economic activities on the footing provided by the community’s natural and social infrastructures. These actors are interrelated with the environment in a diverse fashion,

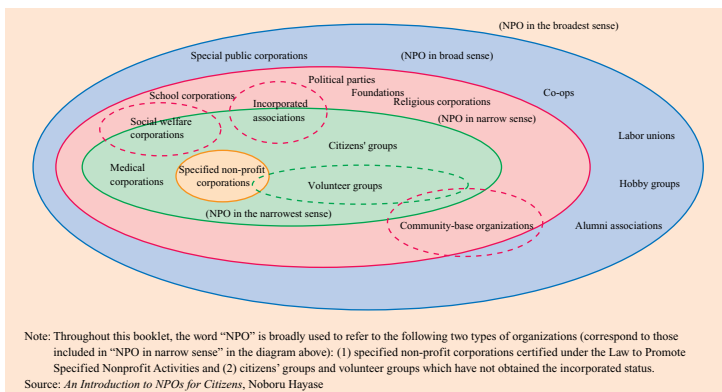
Actors Comprising the Local Community and their Role in Environmental Conservation Activities



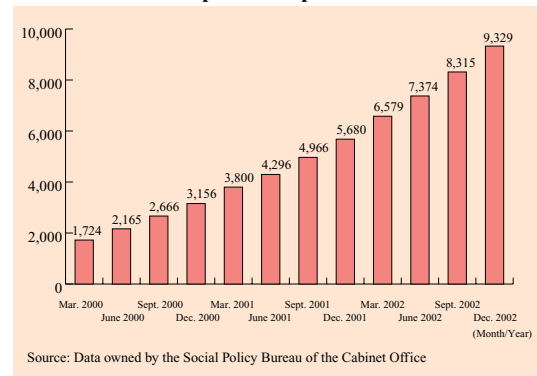
depending on their position and conditions. Some actors impose burden on the environment, while others make use of the environment. Other actors are committed to the conservation or the creation of the environment and still others want to study the environment. These actors exchange environmental information.

Today, NPOs are becoming indispensable as an actor that pursues public interest. Because of their unique characteristics of being able to implement, in a timely manner at the local level, a variety of activities that may not be entrusted to governments or the business community, NPOs are expected to play an increasingly important role in the area of the environment.

Types of Non Profit Organization



Increase in the Number of Specified Non-profit Corporations



3. Environmental Conservation Efforts Based on Local Diversity

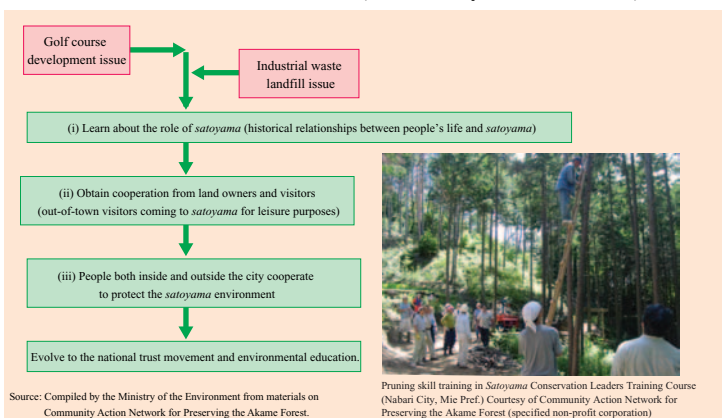
As explained above, environmental conservation efforts undertaken by individual communities entail dynamic collaborations between the natural and social infrastructures and actors unique to each community. Consequently, the direction and contents of actions undertaken to create a desired community, as well as approaches, should naturally vary from community to community. So, when various actors cooperate to make efficient use of the local characteristics distinctive to that community, it will open up new possibilities that are not possible through the effort of a single person.

Section 3: Nurturing the Local Environmental Capacity through Acquiring an Accurate Picture of Local Resources and Partnership among Actors

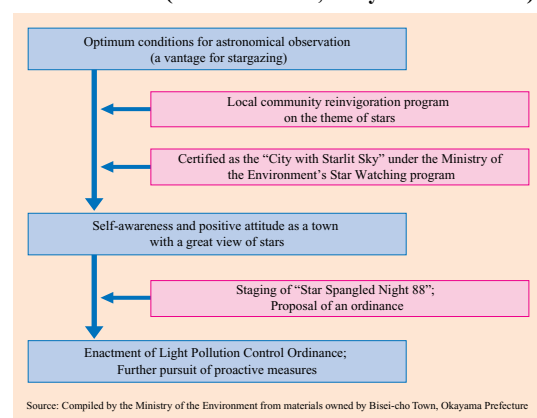
1. Starting Point of Local Environmental Conservation Activities

Environmental conservation activities in the community may be initiated in two ways. One is the "local problem oriented" approach that focuses on overcoming problems that have manifested themselves in the area. The second is the "local characteristics utilization" approach that identifies distinct local characteristics and makes full use of them for betterment of the community. In either approach, the ability to recognize the opportunities in one's familiar surroundings and how well one can translate such opportunities into specific actions will serve as the starting point for local efforts.

Eco Resort Akame-no-Mori (Nabari City, Mie Prefecture)



Home of Stars (Bisei-cho Town, Okayama Prefecture)



2. Acquiring an Accurate Knowledge of Local Resources

An accurate understanding of local resources (natural and social infrastructures and actors in the community) is a necessary prerequisite to use them effectively in environmental conservation efforts.

Minamata City in Kumamoto Prefecture directed its attention to the local community. Based on the principle of learning about local communities and renewing the relationship between nature and people as well as interpersonal relationship, the city has implemented a program called “community study.” “Community study” promotes community reinvigoration and the creation of an environmentally conscious community. Under this initiative, the city first compiled an extensive range of data and information concerning the community obtained through surveys carried out by residents of the area around the Minamata River basin. The city then utilized the data to formulate comprehensive municipal plans and basic environment plans, conclude local environmental agreements, stimulate the growth of local industries and promote ecotourism. Thus, “community study” encourages community residents to conduct surveys on their own initiative and discover the community’s climate as well as life and culture and to utilize this knowledge to change their lifestyles. Through this encouragement, the initiative helps reinvigorate and create an environmentally conscious community.

In light of the approach described above, another method to acquire accurate knowledge of the community may be taking field trips within the area in order to grasp its current situation by employing one’s five senses to the fullest extent. Enjoying activities based in reality and engaging in voluntary efforts not only allow us to develop a sense of attachment to the community but also motivate us to take action. Another approach may be interviewing local people who are well acquainted with the community.

Pooling the collected information is helpful to get an overall picture of the community. It is also important to rediscover one’s own community, e.g. by comparing with other areas or obtaining input from outside experts.

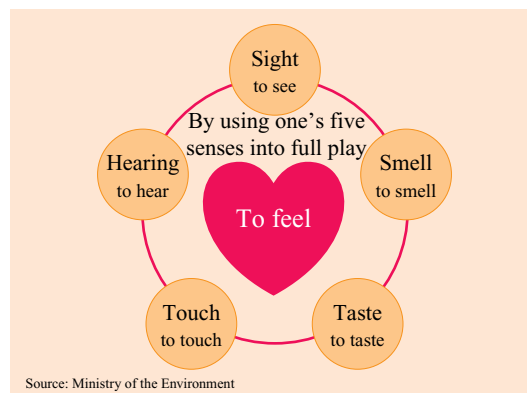
Getting accurate knowledge about local resources can lead to renewed interest in untapped resources, resources that may be used to create an environmentally conscious community. For example, Tachikawa-machi Town in Yamagata Prefecture works to revitalize the community by turning what was considered nothing more than a nuisance to the community—strong wind—to an advantage by harnessing it to generate electricity.

3. Collaboration among Actors

In addition to environmental problems, communities are saddled with various social and economic problems. Today, society has become more sophisticated and complex, individual actors have become more specialized, and actors dedicated to environmental issues have grown in number. In this society, it is necessary to integrate the opinions and goals of a vast array of actors so that the efforts to improve the community may be better oriented. To this end, all actors in the community must form a far-reaching partnership.

Mishima City in Shizuoka Prefecture has adopted the Groundwork method that was conceived in England. In this tripartite area-wide participation scheme, citizens play the leading role joined by local government and businesses. Under the Groundwork method, efforts are underway to restore the scenic quality of the riparian environment that was spoiled due to excessive pumping of groundwater and area development. The Groundwork involves a dedicated organization called the trust established by three cooperating actors of the area, i.e. residents, businesses, and local government. These actors work in a partnership to conserve the local environment. In England, the trust provides a work venue for women, people in their 40s and 50s, and those deeply interested in environmental issues as well as providing settings

How to “Feel” the Community

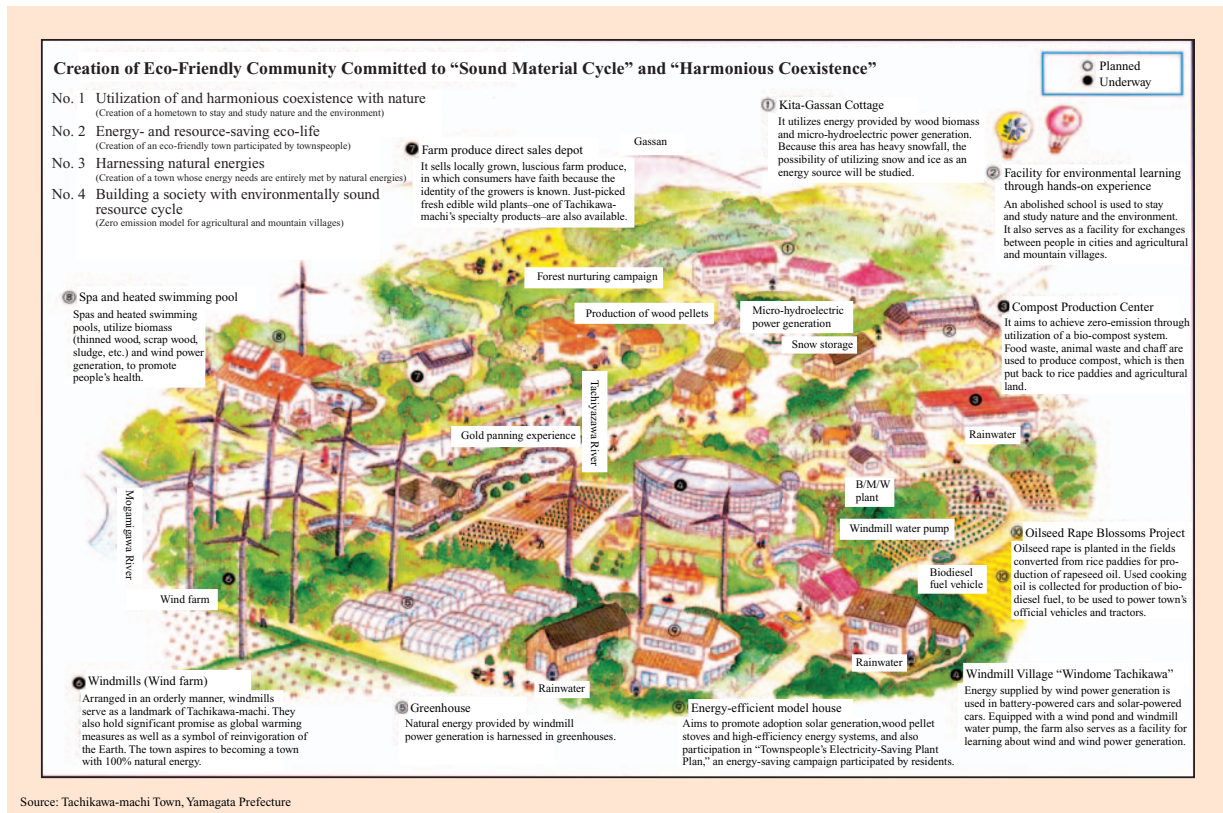


Specific Ways for Getting to Know the Community

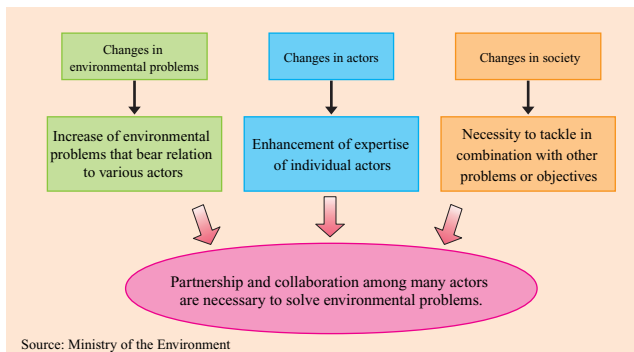
	Specific ways
(i) See and feel the community on one's own	Town watching; Nature game; Regional observation program; Orienteering; Stamp rally; Nature trail hiking; Town expedition; Clean-up campaign
(ii) Study about the community on one's own or learn from others	Community study; Study of local history; Community reinvigoration event
(iii) Learn about the community by making something jointly with others	Map making; Creation of community reinvigoration picture book
(iv) Know about one's community by learning about other communities	Research on activities of other communities; Study tours to other areas; Inviting people from other communities for a lecture and comments

Source: Ministry of the Environment

Eco Green Town Tachikawa Project



Necessity of Partnerships among Actors



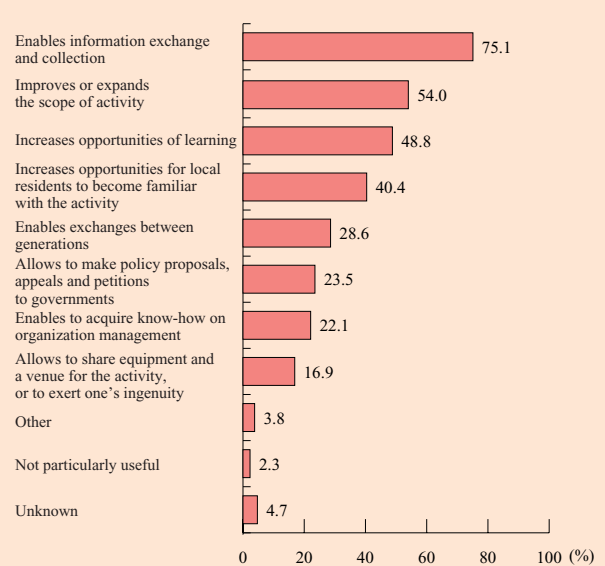
where people can find purpose of life, feel a sense of fulfillment, and make a contribution to society. In the case of the environmental conservation effort of Mishima City, the local government, residents and children each fulfill their role. The effort is financially supported by funds contributed by participating citizens' groups, corporations and local government. There is also support in the form of donation of goods. Collaboration like this engenders relationships built on mutual trust and results in noticeable reinvigoration of the community.

As seen in the above case, partnerships among actors can be expected to produce synergistic effect that will yield greater positive results than if actors worked independently. Also, collaboration among actors has the advantages of increasing public recognition and social credibility of their activities and making them financially stable. Inter-actors collaboration is expected to provide an opportunity for obtaining support from community residents.

4. Information Dissemination and Sharing

Information about the state of the environment, community-implemented programs, and human resources is crucial

Merits (Advantages) of Partnership among Actors



Note: Multiple answers about how useful exchanges, cooperation and partnerships with other organizations are. Respondents consisted of 213 citizens' groups registered in Setagaya Ward, Tokyo.

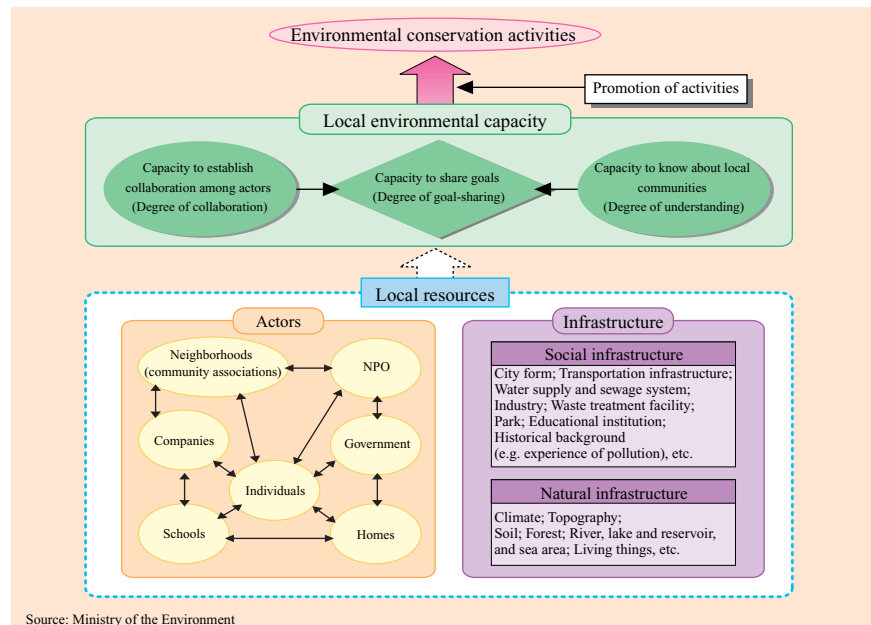
Source: White Paper on the National Lifestyle FY 2000, Cabinet Office

to get an accurate picture of the local community and make effective partnerships among actors. Such environment-related information is also a prerequisite for motivating the actors to engage in environmental conservation. It is important that those who possess environmental information and those who implement environmental measures disseminate and offer the information for sharing. Doing this raises the degree of specialization of the efforts and expands the range of possibilities for utilization of local resources.

5. Efforts to Nurture “Local Environmental Capacity”

As described above, acquiring an accurate picture of local resources and forming an inter-actor partnership enables the entire community to share a common vision and thereby increase the so-called “local environmental capacity”—a commitment to improving the environment and community and the capacity to achieve the established goal. So, local environmental capacity allows us to obtain a picture of the community from all perspectives, including environmental, social and economic, and this will ultimately lead to the effective implementation of area-wide efforts toward a truly sustainable community.

Environmental Conservation Activities Utilizing Local Environmental Capacity



Source: Ministry of the Environment

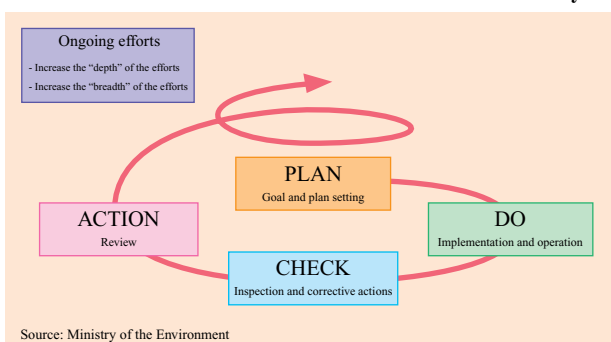
Section 4: Scope and Effectiveness of the Effort that Utilizes the Local Environmental Capacity

1. Continuation of Environmental Conservation Activities

To make environmental efforts long-sustained, it is important, by creating a system to efficiently and effectively carry out the activities, to monitor the area continuously, set appropriate goals, and maintain the local environmental capacity (the commitment and ability to achieve the goals).

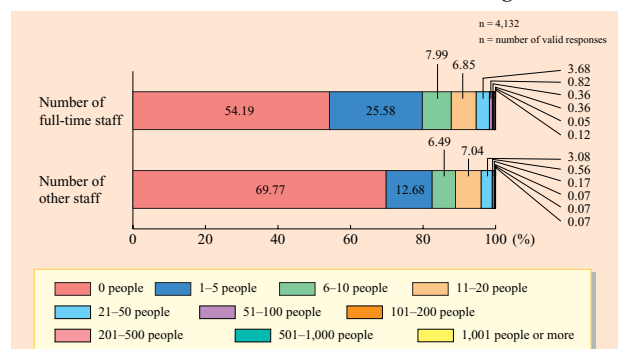
Recruiting leaders and participants is also important. Specifically, it is important to encourage people to coordinate the respective roles of actors while enhancing the awareness of participating actors through the activities they are involved. In addition to these leaders, a broad range of people is needed to support these efforts, people who work in the front line, members whose membership dues support the activity, and people who have the expertise to give advice or guidance. Recruiting such a diverse range of people creates a setting where participants can concentrate on bringing

Environmental Conservation Activities Based on PDCA Cycle



Source: Ministry of the Environment

Number of Staff in Environmental Conservation Organizations



Note: “Other staff” refers to part-time, temporary or unpaid staff constantly involved in planning and running of the organization
Source: Compiled by the Ministry of the Environment based on FY 2001 Environmental NGOs Compendium, Japan Environment Corporation

their abilities to full play, which in turn enables the community efforts to be carried out in a responsible manner and with a sense of pride.

To ensure the continuance of local actions, funds and operation bases are required as a mechanism for linking local environmental capacity with local efforts. According to a poll of citizens' groups, 46% of the groups advocating environmental conservation have fiscal size of 1 million yen or less, and many of them have difficulty in expanding or maintaining their activities owing to a shortage of funds. When asked what areas they wish to receive support from governments, 49.7% of respondents cited "information exchange and securing and/or upgrading a place to serve as a base for activities." Thus, challenge that lies ahead is finding ways to increase funding and upgrade operation bases for local actions.

2. Community Reinvigoration Effort through Local Environmental Capacity and its Effects

Today, there is public recognition of the importance of environmentally sound community development. The Law for the Promotion of Nature Restoration enacted in December 2002 provides a framework for nature restoration projects implemented through the participation of various local actors. The projects already underway in Kushiro-shitsugen wetlands and in Kunugiyama district of Saitama Prefecture can be considered as the efforts that aim to balance or consolidate the area's economic development with environmental conservation.

Because local programs based on local environmental capacity require a grasp of the community's distinctive characteristics and area-wide unified efforts, they not only protect the local environment but also bring about economic benefits and revitalization of the area, ultimately contributing to the creation of a society where development and environmental conservation are simultaneously achieved.

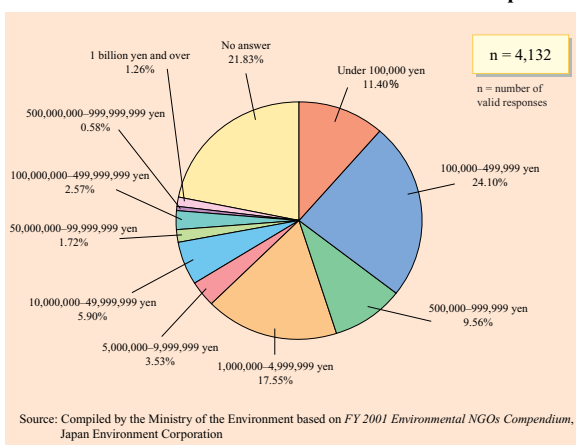
For example, the concept of "sustainable tourism"—as opposed to resort development-oriented tourism—has captured public attention. What characterizes this approach is the simultaneous attainment of environmental conservation, maintenance of local communities, and long-term economic benefits through the use of the area's natural, cultural and historical heritages, and, sometimes, through the infusion of innovative ideas. Yufuin-cho Town in Oita Prefecture may be said to embody this concept. The town successfully preserves its abundant natural environment while at the same time welcoming more than three million tourists annually.

There is also a move to foster community-led efforts to develop the social economy by promoting environmentally friendly community businesses. The *Nanohana* Project (Oilseed Rape Blossoms Project) in the Lake Biwa area of Shiga Prefecture represents a community business program that encompasses the cultivation of oilseed

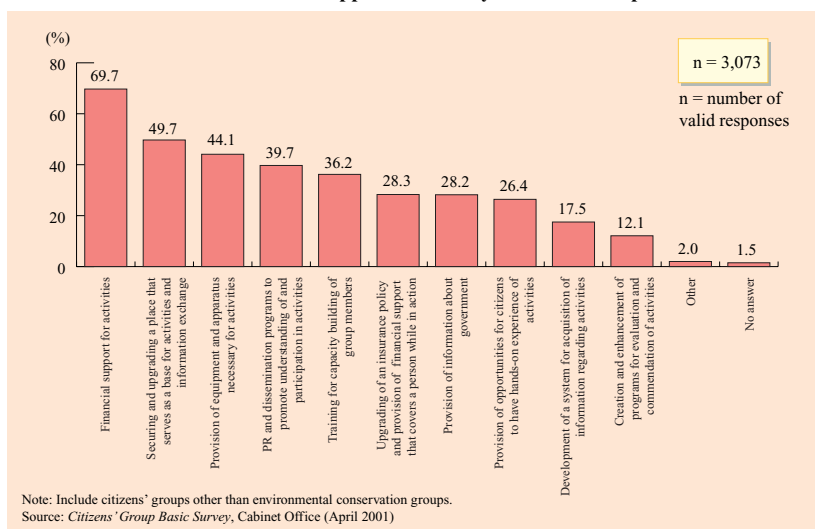
Skills Needed to Make Full Use of Local Environmental Capacity



Fiscal Size of Environmental Conservation Groups



Government's Support Needed by Citizens' Groups



rape, extraction and utilization of rapeseed oil, and utilization of waste oil and oil cake. The project enables balancing environmental conservation and resource recycling activities with commercial activities.

Thus, not only can the efforts based on local environmental capacity provide local residents with a purpose, an opportunity for self-fulfillment and spiritual richness, but they can also promote intra-community exchanges thereby fostering a sense of community and producing synergistic effect to encourage people to participate in community-building initiatives. When the positive aspects of the local community are communicated both inside and outside of the area, interaction with people outside will be stimulated and will lead to an increase in residents, companies, and business establishments in the community.

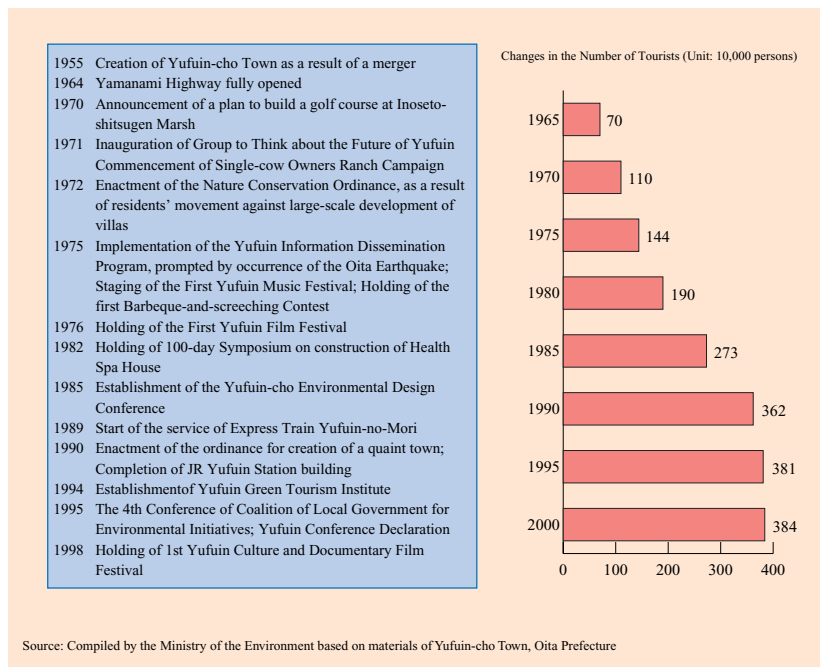
3. Enhancing the Local Environmental Capacity through Partnerships with Other Communities

Initiatives based on the local environmental capacity may sometimes be undertaken beyond the boundaries of the areas.

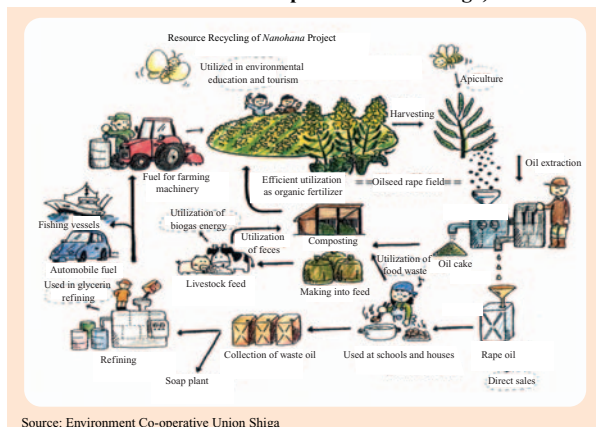
For instance, when effective use of local resources is not easily carried out by a single community, implementing a joint program with other communities might produce the desired results. Tokyo's Kita Ward and Kanra-machi Town in Gunma Prefecture joined forces to solve problems that each has experienced in the past through a complementary partnership. School lunch leftovers at elementary and junior-high schools in Kita Ward are composted for use for organic farming in Kanra-machi Town, and harvested crops are used to prepare school lunch in Kita Ward. This program has also helped reduce the amount of leftovers at elementary and junior-high schools in Kita Ward.

In a case where a problem cannot be addressed effectively without involving the entire region where socio-economic activities and the workings of nature take place, it is imperative to increase local environmental capacity through region-wide partnerships. Yabe-machi Town (Kumamoto Prefecture), located on the upper reaches of Yabegawa River, and Kumamoto City, situated on the lower reaches of the river, directed their attention to the forest's water recharging function and, to take advantage of this function in groundwater conservation, have concluded a forest improvement agreement. There is every indication that residents' participation of the two cities in forest

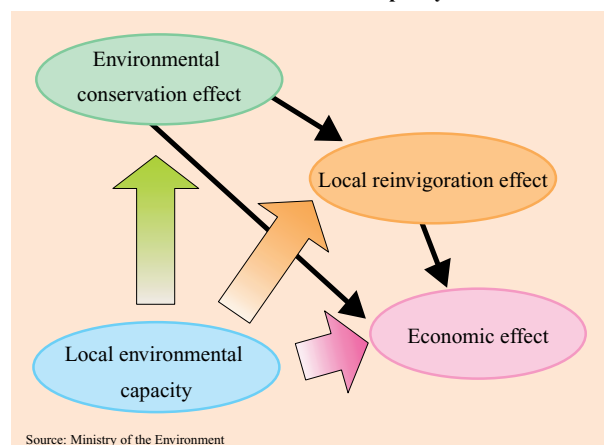
Sustainable Tourism of Yufuin-cho Town, Oita Prefecture



Nanohana Project (Oilseed Rape Blossoms Project of Environment Co-operative Union Shiga)



Effects of Local Environmental Capacity Utilization



management activities offers excellent opportunities for exchanges between the two communities and learning about the relationship between the sea and mountain.

There is also an instance where communities saddled with the same problems can collaborate in information exchange and joint research to broaden the scope of their initiatives.

Still another example is the community effort that embraces a broader perspective of improving not just the local but also the global environment and provides developing nations with environmental cooperation, chiefly in the realm of the pollution control measures, drawing on the area's pollution experience.

The City of Kitakyushu has systematically organized its local resources (i.e., past experience in overcoming pollution, successes in international cooperation, and pollution prevention technologies) and developed an extensive range of human resource use programs and training materials. The city currently offers support programs to cities including Dalian, China, that consist primarily of joint projects and human resources development

4. Propagation of Local Initiatives to Outside the Community

Initiatives based on local environmental capacity that have proven effective within the area can become significant to society in general by reinvigorating various areas as they propagate to other communities both inside and outside Japan.

For example, civic movements, such as the promotion of laundry soap in the Lake Biwa area, coupled with local government's energetic efforts to conserve the environment of the lake culminated in the International Conference on the Conservation and Management of Lakes held in response to the appeal of Shiga Prefecture. The conference established a precedent where the initiative of a local government produced a setting conducive to international exchange and the propagation of the theme of conservation of the environment of lakes and marshes.

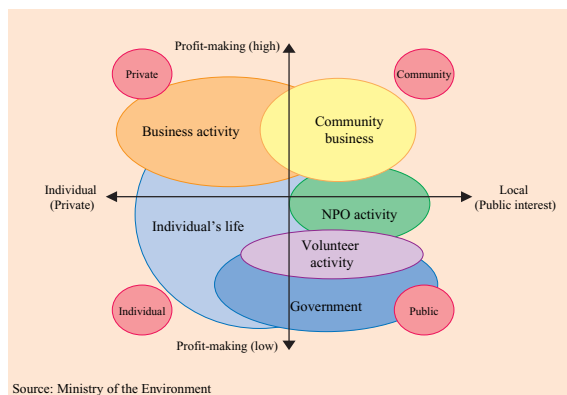
5. Working toward the Creation of a Sustainable Society through Local Environmental Capacity

As we have seen so far, local environmental capacity aids in the creation of a sustainable local community on two fronts: environmental conservation and community reinvigoration. Promoting programs based on local environmental capacity is not easy, but each of the initiatives has the potential to spread as an effective model for balancing the development of the local community with environmental conservation. They also can serve as significant forces for change toward a sustainable society. Today, it has become vital for individual communities to nurture and increase their local environmental capacity.

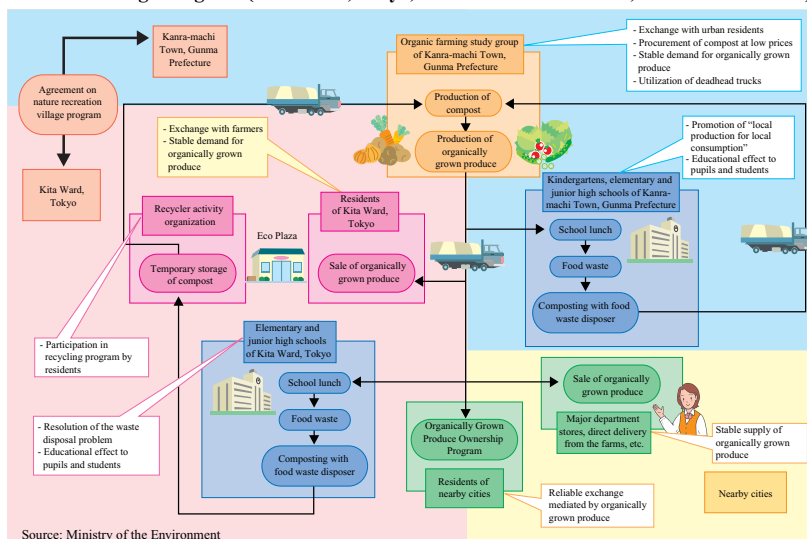
Conclusion

Given the fact that environmental constraints have begun to loom over our daily life, it is essential that each of us take swift action to tackle this tough issue, bearing in mind that each of us is cast in a leading role in environmental efforts. As "Making It Happen!" was the theme of the Johannesburg Summit, taking actions on our own initiative and from our own backyard, i.e., in our daily life and in our local communities, can become a positive step forward that will carry us closer to a change leading to a sustainable society.

Positioning of Community Businesses



Food Exchange Program (Kita Ward, Tokyo, and Kanra-machi Town, Gunma Prefecture)



Part Two

Current Environmental Issues and Environmental Conservation Measures by the Government

Part Two of the *Quality of the Environment in Japan 2003* introduces the environmental conservation measures implemented in FY 2002 based on the state of environmental problems and in line with the Basic Environment Plan, in the chapters structured as shown below. Part Two of this booklet will make clear the issues and current state of environmental problems in the major fields.

- Chapter One: Measures for Various Environmental Problems
- Chapter Two: Basis of Various Measures, and Measures Facilitating the Participation of Various Actors
- Chapter Three: Promotion of International Activities
- Chapter Four: Effective Implementation of the Basic Environment Plan

1. Conservation of the Global Atmospheric Environment

(1) Global Warming

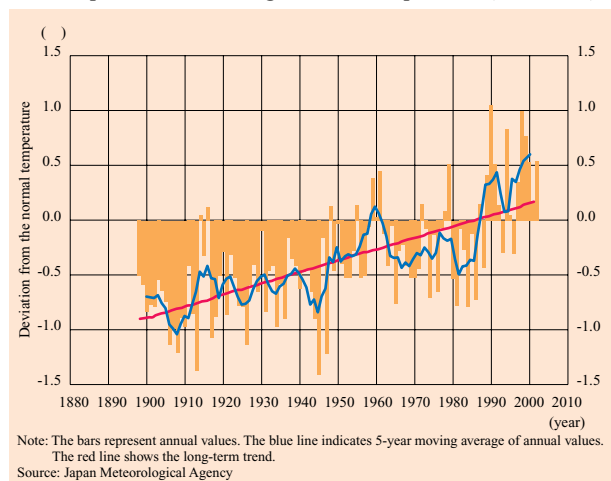
In recent years, expanding human activities have discharged vast quantities of carbon dioxide, methane and other greenhouse gases into the atmosphere. These gases have enhanced the greenhouse effect and have given rise to the threat of global warming.

According to the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report—Climate Change 2001, the global average surface temperature has increased since 1861. Over the 20th century the increase has been $0.6 \pm 0.2^{\circ}\text{C}$. The progress of global warming may have far-reaching and serious effects on both the living environment of humans and the natural habitats of other living organisms. According to the 2001 IPCC Report, global mean sea level is projected to rise by a maximum of 88 cm between 1990 and 2100. According to observations conducted by the Japan Meteorological Agency, Japan has also experienced an increase of about 1.0°C in the annual mean temperature over the last one hundred years. The effects of global warming on the natural environment have already become apparent, as shown by the decrease in the area of sea ice in the Sea of Okhotsk and range shifts of plants and animals.

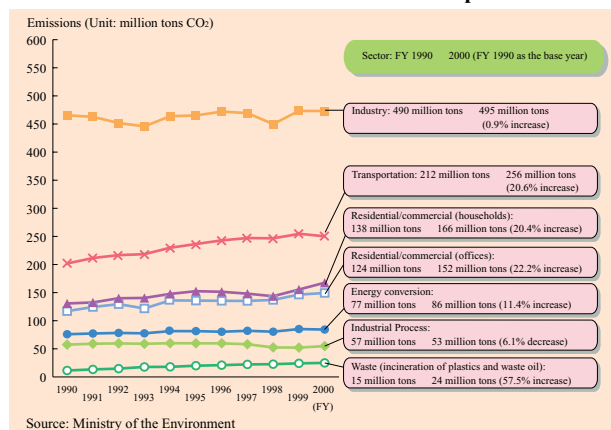
Of the amounts of greenhouse gases emitted in Japan in FY 2000, carbon dioxide emissions were 1,237 million tons, with a per-capita emission of 9.75 tons. Compared to the FY 1990 figures, total emission has increased by 10.5% and the per-capita emission by 7.6%. A breakdown by sector shows that emissions from the industrial sector have increased by 0.9%, the commercial/institutional sector by 22.2%, the residential sector by 20.4% and the transport sector by 20.6%.

In May 2002, Japan revised the “Law Concerning the Promotion of the Measures to Cope with Global Warming,” and in June of the same year concluded the Kyoto Protocol that sets legally binding quantitative targets for greenhouse gas emissions in developed nations. Drastic initiatives will be needed to devise a solution to the problem of global warming. These initiatives include strengthening policies in all areas of our socio-economic system, organically structuring the various policies, and in the future reengineering our current socio-economic system of mass production, mass consumption and mass disposal.

Secular Changes in Deviation from Japan's Annual Average Surface Temperature (1898–2002)



Emissions of Carbon Dioxide in Japan



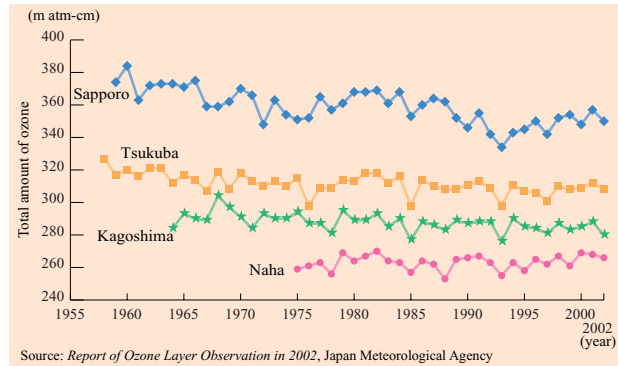
(2) Depletion of the Ozone Layer

It is well known that the ozone layer has been destroyed by ozone-depleting substances (ODSs) such as Chlorofluorocarbons (CFCs). Ozone layer depletion leads to the increase of the quantity of harmful ultraviolet rays reaching the earth and the increased radiation may possibly cause health damages such as skin cancer and cataracts in humans.

The ozone layer is being depleted almost over the entire globe, with the exception of the tropical areas, and the decrease is particularly notable at the higher latitudes. In Japan, too, a statistically significant depletion in the ozone layer above Sapporo (which is northern part of Japan) has been observed. The largest ozone hole above Antarctica was recorded in 2000.

In 1988, the Japanese Government enacted the Ozone Layer Protection Law to regulate the production, etc. of ODSs such as CFCs. Then in June 2001, the government enacted the Law for Ensuring the Implementation of Recovery and Destruction of Fluorocarbons concerning Specified Products (Fluorocarbons Recovery and Destruction Law). The Law requires recovering and destroying of fluorocarbons when discarding commercial refrigeration and air conditioning equipment, or automobile air conditioners.

Changes in the Annual Average of Total Ozone over Japan



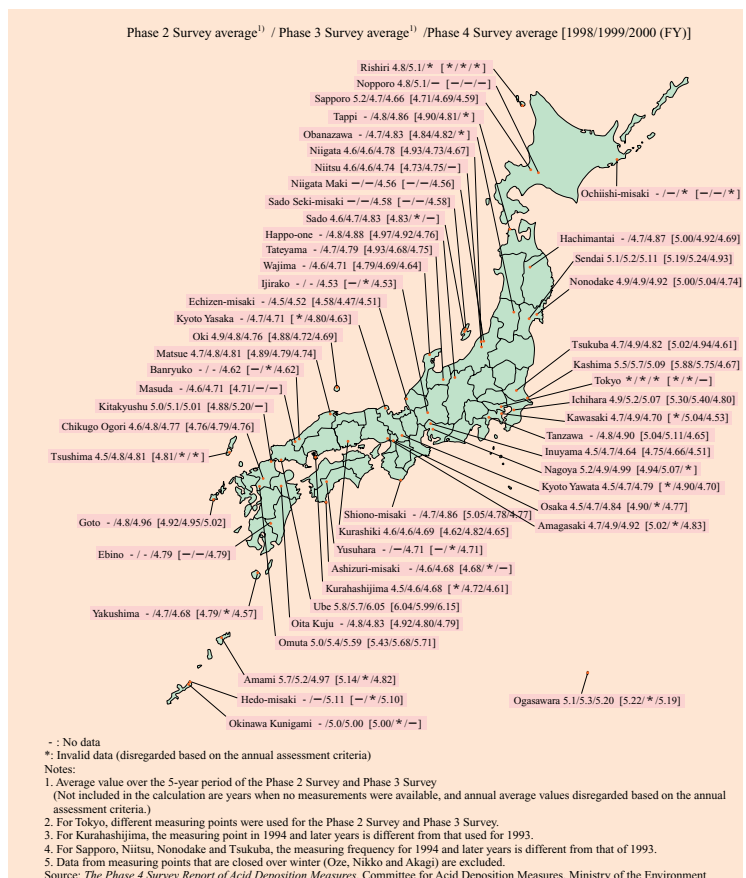
2. Conservation of the Atmospheric Environment (not including the global atmospheric environment)

(1) Acid Deposition

Air pollutants such as sulfur oxides and nitrogen oxides emitted to the atmosphere by the combustion of fossil fuels are converted to sulfuric and nitric acids. These acids are incorporated into clouds, and fall onto the ground in the form of rain, snow and mists. These deposited acids increase acidity in soils and inland water such as lakes and rivers, and impact on forests, fishes, and other living creatures. The acid deposition also impacts on trees and cultural assets.

The impact of acid deposition in Japan is still not apparent at this time. But it is considered that the impact of acid deposition may take a long time before it becomes apparent, and the acid deposition will become a critical problem in the future.

Levels of pH in Precipitation



(2) Photochemical Oxidants

Photochemical oxidants are secondary pollutants formed when primary pollutants composed mainly of nitrogen oxides (NO_x) and hydrocarbons (HC) emitted from factories, business establishments and automobiles are exposed to sunlight and experience a photochemical reaction. Photochemical oxidants are a cause of photochemical smog that causes eye and throat irritation and respiratory distress. Level of exposure to photochemical oxidants still exceeds the environmental quality standard (EQS)—a one-hour value of 0.06 ppm or less—in almost all regions throughout the country.

(3) Nitrogen Oxides

Nitrogen oxides (NO_x) are mainly generated by combustion from stationary sources, such as factories, and mobile sources, such as motor vehicles. High concentrations of NO_x can damage the respiratory system.

The average annual values for nitrogen dioxide concentrations have remained steady over a long time. Its concentration achieved a 99.0% compliance with the environmental quality standard for nitrogen dioxide in ambient air pollution monitoring stations in FY 2001. Since compliance with the environmental quality standard remained low in large cities, which were specified as target areas for countermeasures by the Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Specified Areas (Automobile NO_x Law), in 2001, the Law was revised and strengthened to become the Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides and Particulate Matter from Automobiles in Specified Areas (Automobile NO_x/PM Law).

(4) Suspended Particulate Matter (SPM)

Suspended particulate matter in the air with a diameter of 10µm or less is categorized as primary particles or secondary particles. Primary particles include soot and dust from factories, diesel exhaust particles (DEP) generated from diesel vehicles, and soil particles dispersed in the air. Secondary particles are those formed by chemical reaction within the atmosphere from gaseous substances, such as nitrogen oxides (NO_x). Because SPM is minute, it remains in the air for extended periods of time. An accumulation of SPM in high concentrations in the lungs or the trachea can have damaging effects on the respiratory system.

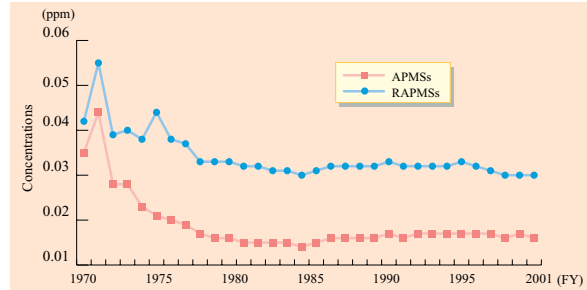
The annual average for SPM concentration in recent years has shown signs of a shift from a steady state to a steady decline. However, the compliance rates to EQS have been in decline since FY 2000. In FY 2001, under the Automobile NO_x/PM Law, particulate matter was added in the list of subjects to be controlled. Furthermore, studies have been conducted on fine particulate matter with a diameter of 2.5 µm or less and diesel exhaust particles, for their impact on human health have recently raised concerns.

Changes in the Total Number of Days Warnings Were Issued and Number of Sufferers Reported (1993–2002)

Item	Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Changes in the total number of days warnings were issued (days)		71	175	139	99	95	135	100	259	193	184
Number of sufferers reported (persons)		93	564	192	64	315	1,270	402	1,479	343	1,347

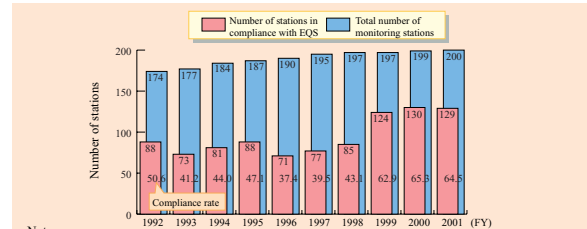
Source: Compiled from Information related to Air Pollution by Photochemical Oxidants in 2002, Ministry of the Environment

Changes in the Annual Average of Nitrogen Dioxide Concentrations (FY 1970–2001)



Source: Compiled from FY 2001 Report on the State of Air Pollution, Ministry of the Environment

Changes in the State of Compliance with the Environmental Quality Standard (EQS) for Nitrogen Dioxide in Specified Areas (RAPMSSs) (FY 1992–2001)

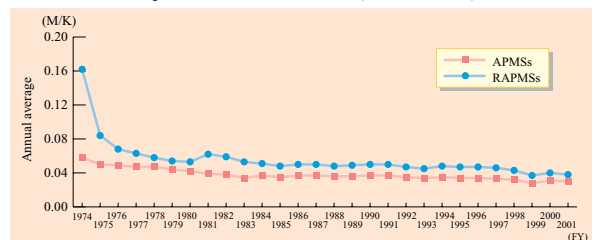


Notes:

1. Specified areas refer to areas in parts of Saitama, Chiba, Tokyo, Kanagawa, Aichi, Mie, Osaka and Hyogo prefectures, which are the areas designated pursuant to the Automobile NO_x/PM Law.
2. Evaluation of air pollution by the EQS for nitrogen dioxide is carried out with the annual 98-percentile of daily averages of nitrogen dioxide taken at each monitoring station.

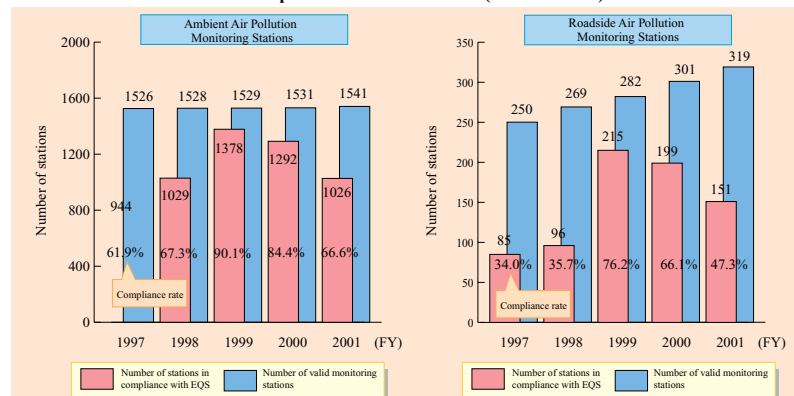
Source: Compiled from FY 2001 Report on the State of Air Pollution, Ministry of the Environment

Changes in the Annual Averages of the Concentration of Suspended Particulate Matter (FY 1974–2001)



Source: Compiled from FY 2001 Report on the State of Air Pollution, Ministry of the Environment

Changes in the State of Compliance with the Environmental Quality Standard (EQS) for Suspended Particulate Matter (FY 1997–2001)



Source: Compiled from FY 2001 Report on the State of Air Pollution, Ministry of the Environment

(5) Hazardous Air Pollutants

Based on the Air Pollution Control Law, measures against hazardous air pollutants focus on the promotion of voluntary efforts by businesses as well as the control of emission of designated substances, such as benzene.

In FY 2001, the concentration of benzene in the ambient air exceeded the environmental standard in 67 of 368 sites. To reduce benzene emissions further, voluntary efforts by businesses in five areas where benzene concentration is consistently high have been encouraged since FY 2001.

(6) Noise, Vibration and Offensive Odors

Noise, vibration and offensive odors affect the human senses and are becoming important issues, along with air pollution, in the conservation of a favorable living environment. Among various types of pollution, noise and offensive odors are problems that are closely related to everyday life. The sources of these problems are complex and diverse. Each year, complaints about noise and offensive odors account for the large percentage of pollution-related complaints. Complaints about noise had declined over the last ten years but began to increase in FY 2000. Complaints about offensive odors have increased over the past several years. In particular, complaints about odors from outdoor incineration have dramatically increased.

(7) Heat Island Phenomenon

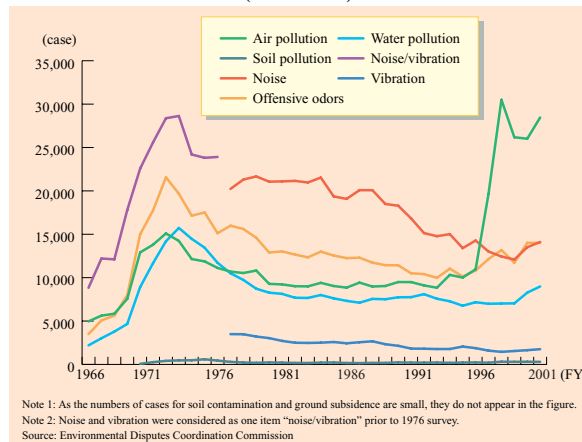
The heat island phenomenon occurs when temperatures rise more in urban areas than in surrounding suburban areas. This phenomenon results in an increase in the number of nights in which the temperature stays over 25°C and an increase in energy consumption, mainly in major cities. These factors have an adverse effect on the environment. Policies to help mitigate this phenomenon are necessary. With this backdrop, the Three-Year Program for Promoting Regulatory Reform (re-amended in March 2003) calls for a guideline for measures to mitigate the heat island phenomenon to be created in FY 2003.

3. Conservation of the Water, Soil and Ground Environments

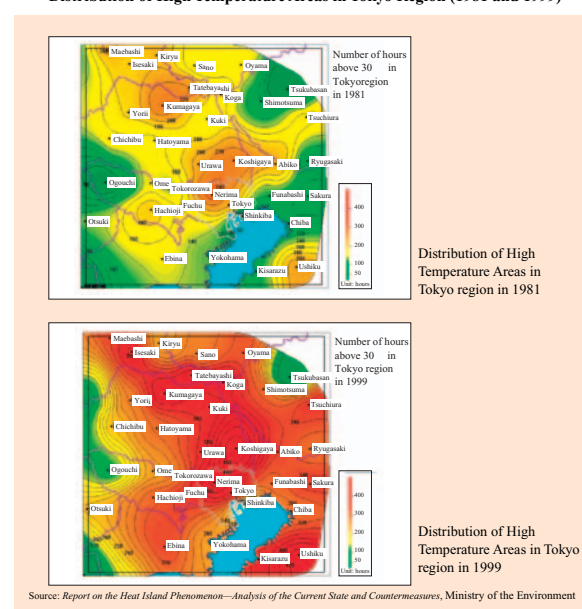
(1) Water Environment

According to the results of the FY 2001 Nationwide Water Quality Survey of Public Water Areas, the rate of compliance with human health-related environmental quality standard (EQS) items such as cadmium was 99.4%. The compliance rate for COD, a typical water-quality indicator for organic pollution as a living environment-related EQS, reached 79.5%. However, compliance rates were still low for enclosed water areas including lakes, reservoirs, inner bays and inland seas. The compliance rate for COD was 68% for Tokyo

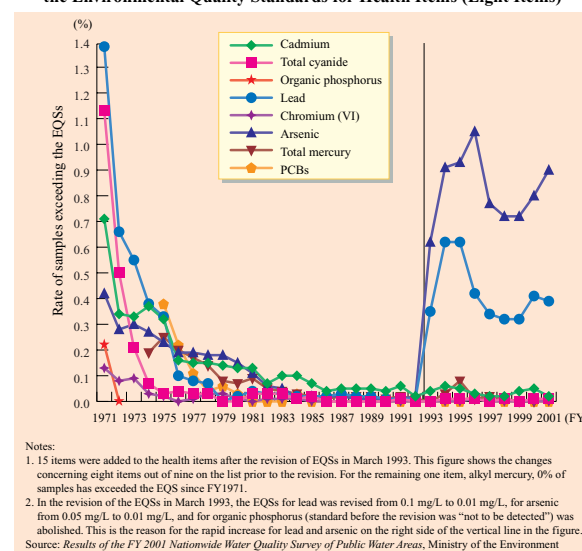
Changes in the Number of Complaints against the Seven Typical Types of Pollution (FY 1966–2001)



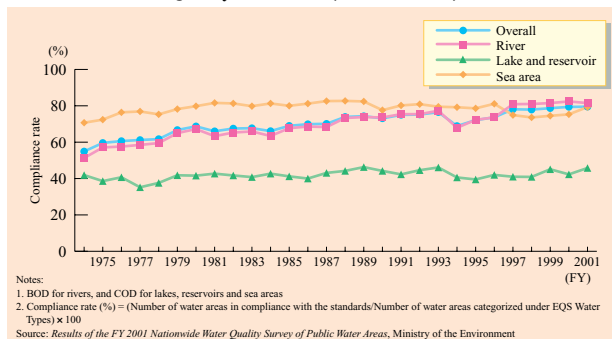
Distribution of High Temperature Areas in Tokyo Region (1981 and 1999)



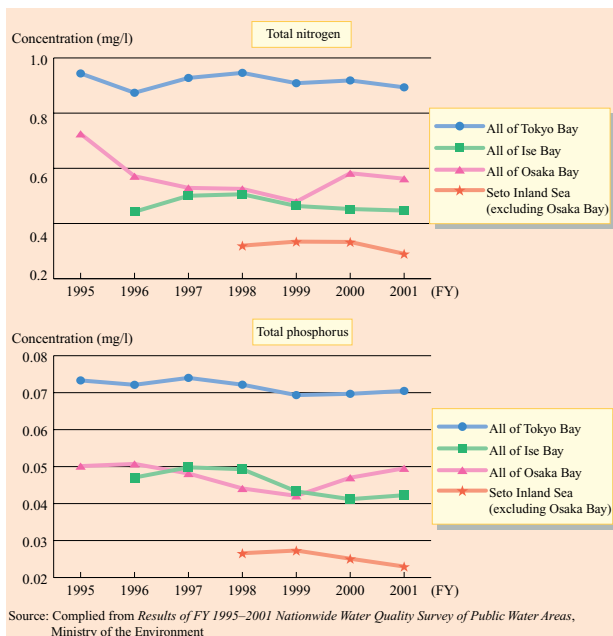
Changes in the Rate of Samples Exceeding the Environmental Quality Standards for Health Items (Eight Items)



Changes in Rates of Compliance with Environmental Quality Standards (BOD or COD)



Changes in the Water Quality of Three Sea Areas



Bay, 56% for Ise Bay, 74% for the Seto Inland Sea and 45.8% for lakes and reservoirs. In order to meet water quality objectives, the total pollutant load control programmes for Tokyo Bay, Ise Bay and Seto Inland Sea have set targets for the total daily COD load permissible from all point sources (with FY 2004 set as the target year). These programmes include nitrogen and phosphorus from 2001, as one of the measures against eutrophication in enclosed water body.

The results of the FY 2001 Water Quality Survey of Groundwater reported that 7.2% of the total wells surveyed had substances that exceeded their environmental quality standards. Nitrate nitrogen/nitrite nitrogen was found in levels exceeding the environmental quality standard in 5.8% of the wells. Immediate measures are needed to deal with this pollution.

(2) Marine Pollution

There were 516 occurrences of marine pollution incidents in sea areas surrounding Japan in FY 2002, an increase of 30 occurrences as compared to FY 2001.

Results of Groundwater Quality Survey for FY 2001 (General Survey)

Substance	Number of wells surveyed	Number of wells exceeding EQS	Excess rate (%)	EQS
Cadmium	3,003	0	0	0.01 mg/L or less
Total cyanide	2,660	0	0	Not detected
Lead	3,362	13	0.4	0.01 mg/L or less
Chromium (VI)	3,175	0	0	0.05 mg/L or less
Arsenic	3,422	44	1.3	0.01 mg/L or less
Total mercury	2,907	3	0.1	0.0005 mg/L or less
Alkyl mercury	1,075	0	0	Not detected
PCBs	2,044	0	0	Not detected
Dichloromethane	3,548	1	0.0	0.02 mg/L or less
Carbon tetrachloride	3,700	0	0	0.002 mg/L or less
1, 2-dichloroethane	3,316	0	0	0.004 mg/L or less
1, 1-dichloroethylene	3,668	0	0	0.02 mg/L or less
cis-1, 2-dichloroethylene	3,673	5	0.1	0.04 mg/L or less
1, 1, 1-trichloroethane	4,290	0	0	1 mg/L or less
1, 1, 2-trichloroethane	3,308	0	0	0.006 mg/L or less
Trichloroethylene	4,371	11	0.3	0.03 mg/L or less
Tetrachloroethylene	4,374	10	0.2	0.01 mg/L or less
1, 3-dichloropropene	2,898	0	0	0.002 mg/L or less
Thiuram	2,506	0	0	0.006 mg/L or less
Simazine	2,638	0	0	0.003 mg/L or less
Thiobencarb	2,575	0	0	0.02 mg/L or less
Benzene	3,324	0	0	0.01 mg/L or less
Selenium	2,600	0	0	0.01 mg/L or less
Nitrate nitrogen/nitrite nitrogen	4,017	231	5.8	10 mg/L or less
Fluorine	3,558	25	0.7	0.8 mg/L or less
Boron	3,408	14	0.4	1.0 mg/L or less
Total (actual number of wells)	4,722	341	7.2	

Source: Results of the FY 2001 Nationwide Water Quality Survey of Groundwater, Ministry of the Environment

Changes in Occurrences of Marine Pollution by Sea Area

(Unit: case)

Year	Sea area	Type of pollutant	Sea area										Total
			Coast of Hokkaido	East coast of Honshu	Tokyo Bay	Ise Bay	Osaka Bay	Seto Inland Sea (excluding Osaka Bay)	Southern coast of Honshu	Coast of Kyushu	Coast of Japan Sea	Southwestern sea area	
1998	Other than oil	Oil	32	24	73	12	16	67	52	47	33	32	388
		Hazardous liquid substances	0	7	1	0	1	2	33	0	0	2	46
		Wastes	8	6	2	13	37	60	33	39	13	0	211
		Other	2	0	9	1	1	11	1	1	0	0	26
		Subtotal	10	13	12	14	39	73	67	40	13	2	283
		Red tide	0	1	2	6	1	8	5	0	3	0	26
1999	Other than oil	Oil	18	33	64	11	14	47	31	37	35	49	339
		Hazardous liquid substances	0	2	2	0	0	1	13	2	0	0	20
		Wastes	13	3	4	20	9	49	40	18	21	4	181
		Other	1	3	6	0	5	5	1	0	2	0	23
		Subtotal	14	8	12	20	14	55	54	20	23	4	224
		Red tide	0	2	10	3	3	2	2	0	4	0	26
2000	Other than oil	Oil	32	43	86	34	31	104	87	57	62	53	589
		Hazardous liquid substances	0	1	0	1	1	1	25	0	1	0	30
		Wastes	10	9	2	45	3	43	10	39	64	1	226
		Other	1	1	4	0	1	3	5	1	0	0	16
		Subtotal	11	11	6	46	5	47	40	40	65	1	272
		Red tide	0	0	15	5	1	1	6	2	1	0	31
2001	Other than oil	Oil	24	34	99	68	22	92	91	73	79	28	610
		Hazardous liquid substances	0	2	1	1	2	1	0	1	0	0	8
		Wastes	15	19	73	28	11	49	31	45	38	18	327
		Other	1	3	3	6	5	32	13	8	31	1	103
		Subtotal	2	6	12	7	7	33	14	9	31	1	122
		Red tide	0	0	16	4	0	3	4	6	4	0	37
2002	Other than oil	Oil	17	25	101	39	18	85	49	60	73	19	486
		Hazardous liquid substances	32	29	68	21	16	63	14	45	42	28	358
		Wastes	0	0	0	0	2	1	4	1	0	0	8
		Other	2	7	2	2	2	12	9	10	33	0	79
		Subtotal	1	1	9	1	0	7	1	2	1	0	23
		Red tide	3	8	11	3	4	20	14	13	34	0	110
2002	Other than oil	Oil	0	3	4	14	0	10	8	5	4	0	48
		Hazardous liquid substances	35	40	83	38	20	93	36	63	80	28	516
		Wastes	0	0	0	0	0	2	1	4	1	0	8
		Other	2	7	2	2	2	12	9	10	33	0	79
		Subtotal	1	1	9	1	0	7	1	2	1	0	23
		Red tide	0	3	4	14	0	10	8	5	4	0	48

Notes:
1. "Hazardous liquid substances" in "Other than oil" refer to hazardous liquids designated by the Law Relating to the Prevention of Marine Pollution and Maritime Disaster or liquids that have not been assessed.
2. "Other" in "Other than oil" includes industrial effluent, blue tides, etc.
Source: Japan Coast Guard

(3) Soil Pollution

Contaminated soil accumulates hazardous substances, perpetuating the state of pollution. In recent years, an increasing number of urban soil contamination cases are found during redevelopment work of former factories and research facilities. There were as many as 134 of such cases in FY 2000. The Soil Contamination Countermeasures Law was established in May 2002 and implemented on February 15, 2003, to carry out measures against soil pollution such as getting an accurate picture of the current state of soil pollution and prevention of harm to human health caused by soil pollution.

(4) Ground Subsidence

Excessive pumping of groundwater can lower the level of the groundwater and shrink the clay layer, which leads to ground subsidence. Once ground subsidence occurs, the ground will not recover to its former level, which can cause damage to buildings and aggravate flooding. There were a total of 61 areas in 37 prefectures that reported ground subsidence by FY 2001.

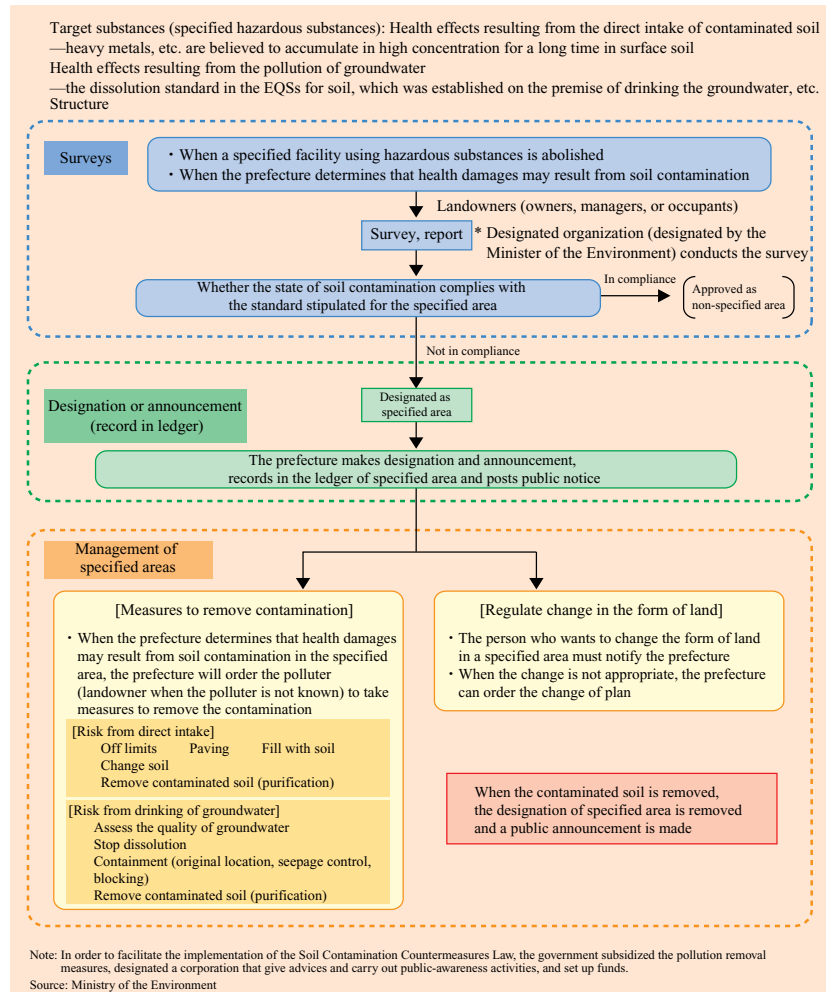
4. Measures for Waste and Recycling

Since FY 1989, Japan has been generating domestic waste at an annual volume of approximately 50 million tons or more. These annual volumes have remained steady over the last several years. Of all domestic waste, direct incineration accounted for 77.4% and recycling accounted for 16.7% in FY 2000. The final volume disposed at landfill sites was 10.51 million tons, a decrease of 360,000 tons from the previous year. Packaging and containers represent 61.0% of domestic waste (volume ratio).

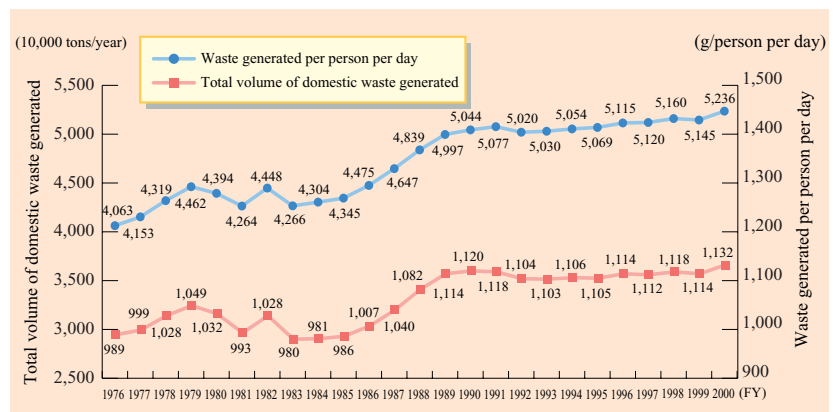
The total volume of industrial waste in Japan has also remained steady over the last several years. The volume in FY 2000 was approximately 406 million tons, a slight increase from the previous year. Approximately 45 million tons were discarded at final disposal sites, a decrease over the previous year in the percentage to the total amount of industrial waste generated. Nationally, an average of 3.9 years of capacity in final disposal sites for industrial waste remained as of FY 2000, presenting a serious situation. The outlook is especially grim for the greater Tokyo area with only 1.2 years of capacity remaining.

To solve these problems, the goals for waste disposal and recycling are prioritized as follows according to the Basic

Outline of the Soil Contamination Countermeasures Law



Changes in the Total Volume of Domestic Waste and Waste Generated per Person per Day



Law for Establishing the Recycling-based Society enacted in 2000: (i) reduce waste, (ii) reuse end-of-life products and parts, (iii) recycle as raw materials, (iv) recover heat as energy, and (v) dispose as final waste. The Law stipulated that the government was to formulate the Basic Plan for Establishing a Recycling-based Society to ensure that waste and recycling measures are implemented in a comprehensive and systematic manner. The Plan, formulated in March 2003, defined a specific image of the type of recycling-based society that Japan is aiming at, target values and the respective roles of citizens, NPOs, NGOs, businesses, local governments, and the national government.

Illegal dumping of industrial waste has remained steady at around 400,000 tons for the past several years, but in FY 2001, the volume decreased drastically to 240,000 tons.

5. Measures for Environmental Risk from Chemical Substances

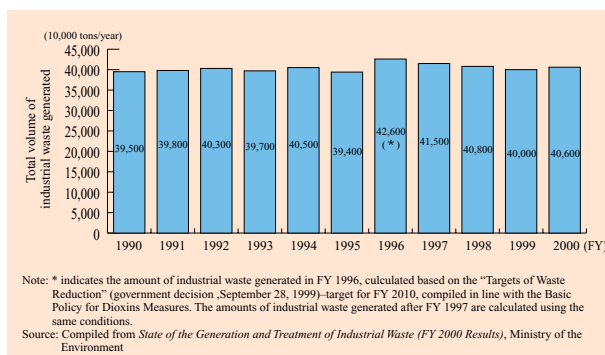
Among the 50,000 or more chemical substances said to be distributed in Japan, there are many that have various kinds of toxicity, such as carcinogenicity and reproductive toxicity. It is feared that these substances may affect humans and the ecosystem through various media, such as air and water.

In order to prevent damage by these substances, the environmental risk (possible interference with environmental conservation) of these chemical substances must be assessed and proper measures must be taken based on the assessment results.

Until recently, Japan's system for evaluating and regulating chemical substances took the position of protecting human health alone. In order to introduce an evaluation and regulation system that focuses on the impact of chemical substances on plants and animals, in addition to the protection of human health, a revised draft of the Chemical Substances Control Law was passed by the Cabinet and sent to the Diet in March 2003. The draft also adopts more efficient and effective measures that take into consideration the possibility of chemical substances being released into the environment. The preparations must be made to implement a new evaluation and regulation system based on the revised Chemical Substances Control Law.

The average daily intake volume of dioxins for humans is decreasing annually. The volume is less than the tolerable daily intake level (4pg-TEQ/kg/day) that is low enough that even if this volume were to be absorbed throughout one's lifetime, it would not have adverse health effects.

Changes in the Volume of Industrial Waste Generated

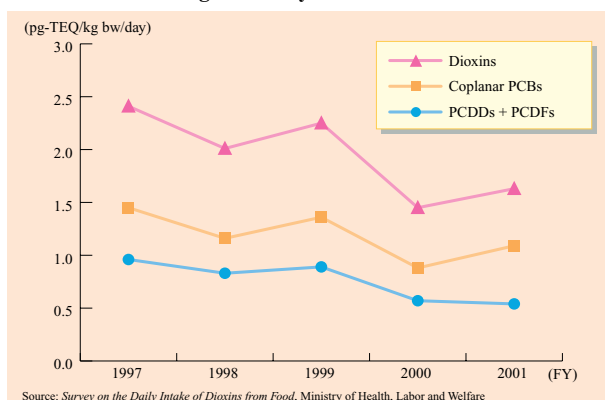


Current State of the Illegal Dumping of Industrial Waste

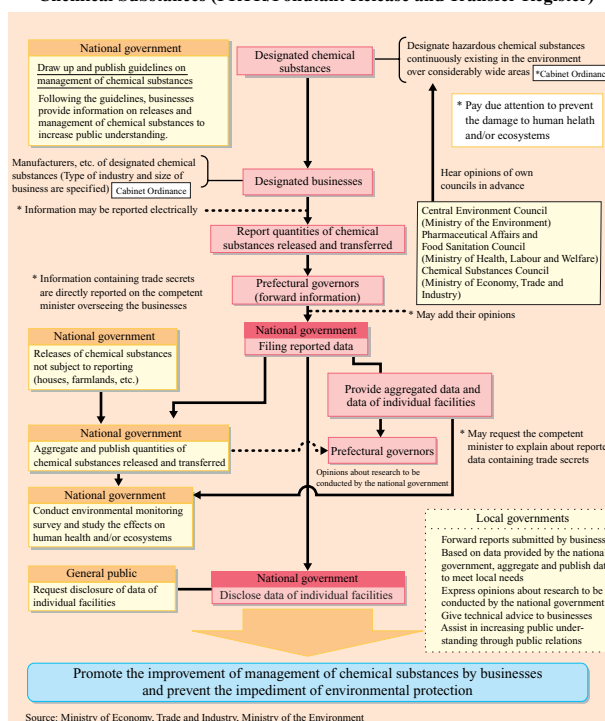
FY	Average of 1993-1995	1996	1997	1998	1999	2000	2001
Number of dumping (case)	435	719	855	1,197	1,049	1,027	1,150
Amount of dumping (10,000 tons)	38.9	21.9	40.8	42.4	43.3	40.3	24.2

Source: Compiled from State of the Illegal Dumping of Industrial Waste (FY 2001), Ministry of the Environment

Changes in Daily Intake of Dioxins



Implementation Procedure of Reporting, etc. of Releases of Specific Chemical Substances (PRTR/Pollutant Release and Transfer Register)



In addition, because the toxicity of endocrine disrupting chemicals, which impact the endocrine system (hormones) by causing damage to or having harmful effects on the body, is mostly unknown, studies are being promoted to gather scientific knowledge.

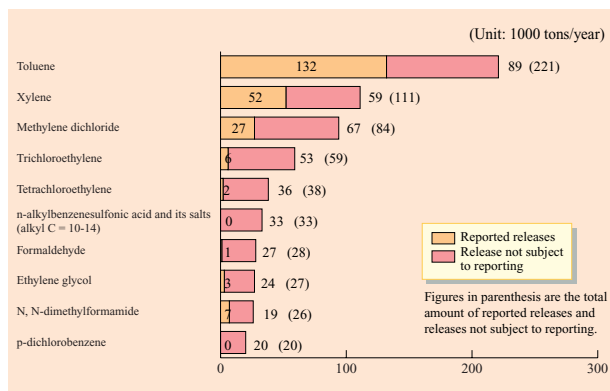
Moreover, Japan introduced the Pollutant Release and Transfer Register system (PRTR system) for chemicals that are suspected of being harmful to human health and ecosystems. The PRTR system assesses, aggregates, and disseminates the amount of these substances released to the environment or transferred off-site from industrial establishments via waste products. Since March 2003, the first results have been published and requests for disclosure of individual data have been accepted. The promotion of risk communication on chemical substances will take on more importance in the future.

6. Ensuring the Coexistence of Man and Nature

When we look at the current state of the natural environment in Japan, we see that natural forests and secondary forests are in decline while afforested areas, urban areas, and reclaimed lands are increasing. The areas of tidal flats and seaweed/seagrass beds as well as natural coastlines are also in decline. The number of species exposed to the danger of extinction includes 2 species of mammals and 39 species of birds. In total, 62 species have been classified as national endangered species of wild fauna and flora in the Law for the Conservation of Endangered Species of Wild Fauna and Flora. The number of threatened species listed on the Red List has reached a little more than 20% of mammals, amphibians, brackish/freshwater fish and vascular plants (Tracheophyte), a little less than 20% of reptiles and a little more than 10% of bird species inhabiting Japan.

With this backdrop in March 2002, the government revised the National Strategy on Biological Diversity based on the following three pillars. (1) Strengthening conservation is proposed to tackle issues such as the extinction of species, decrease in

Top 10 Chemical Substances for Reported Releases and Releases Not Subject to Reporting (FY 2001)

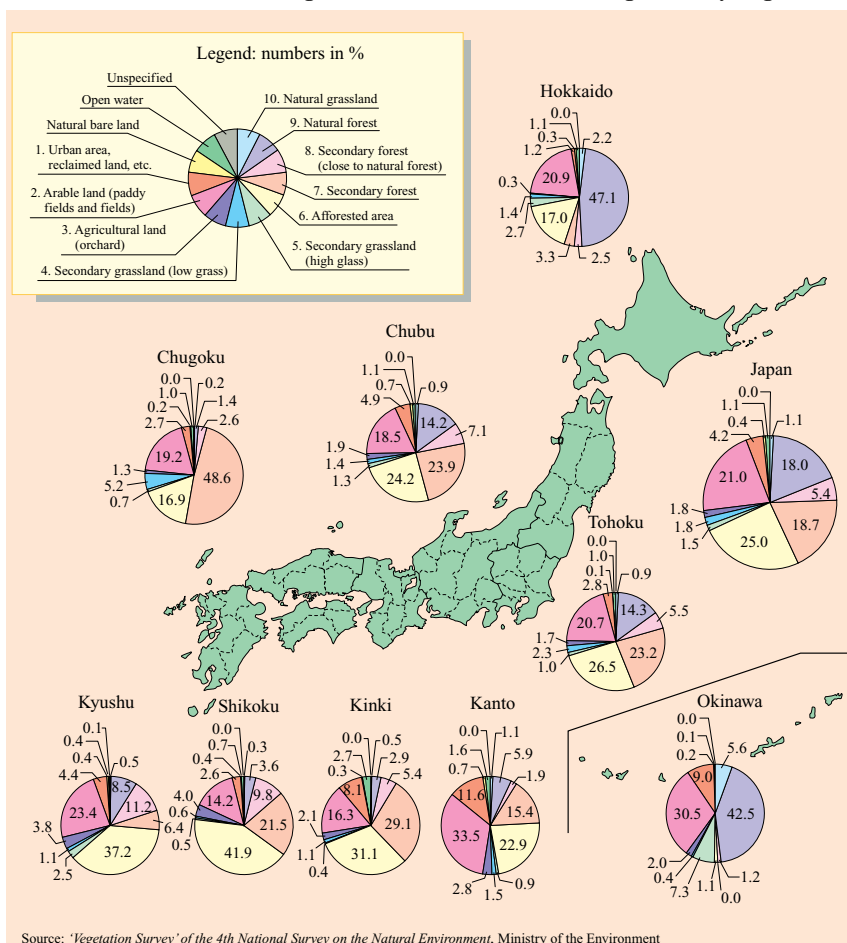


Degree of Human Disturbance of Vegetation

Number of vegetation	Category of Vegetation	3rd Survey		4th Survey		Increase/decrease	
		Number of meshes	Percentage (%)	Number of meshes	Percentage (%)	Number of meshes	Percentage (%)
10	Natural grassland	4,038	1.1	4,011	1.1	- 27	0.0
9	Natural forest	66,979	18.2	66,394	18.0	- 585	- 0.2
8	Secondary forest (close to natural forest)	20,046	5.4	19,733	5.4	- 313	- 0.1
7	Secondary forest	70,484	19.1	69,030	18.7	- 1,454	- 0.4
6	Afforested area	91,029	24.7	92,072	25.0	1,043	0.3
5	Secondary grassland (high grass)	5,737	1.6	5,626	1.5	- 111	0.0
4	Secondary grassland (low grass)	5,939	1.6	6,498	1.8	559	0.2
3	Agricultural land (orchard)	6,798	1.8	6,817	1.8	19	0.0
2	Arable land (paddy fields and fields)	76,945	20.9	77,311	21.0	366	0.1
1	Urban area, reclaimed land, etc.	14,841	4.0	15,420	4.2	579	0.2
	Natural bare land	1,392	0.4	1,416	0.4	24	0.0
	Open water	4,170	1.1	4,211	1.1	41	0.0
	Unspecified	72	0.0	71	0.0	- 1	0.0
	Total	368,470	100.0	368,610	100.0	140	0.0

Source: 'Vegetation Survey' of the 4th National Survey on the Natural Environment, Ministry of the Environment

Distribution Ratio of Degree of Human Disturbance of Vegetation by Region



Threatened Wildlife of Japan (species listed on the Red List and the Red Data Book)

(as of March 2003)

Taxonomical group	Species assessed	Extinct	Extinct in the wild	Threatened species		Near threatened	Lack of information	Threatened local population	Number of threatened species	
				Critically endangered + Endangered	Vulnerable					
Animals	Mammals	Approx.200	4	0	32 12 + 20	16	16	9	12	48
	Birds	Approx.700	13	1	42 17 + 25	47	16	16	2	89
	Reptiles	97	0	0	7 2 + 5	11	9	1	2	18
	Amphibians	64	0	0	5 1 + 4	9	5	0	4	14
	Brackish water and freshwater fishes	Approx. 300	3	0	58 29 + 29	18	12	5	14	76
	Insects	Approx. 30,000	2	0	63	76	161	88	3	139
	Land/freshwater molluscs	Approx.1,000	25	0	86	165	206	69	5	251
	Spiders/crustacea	Approx.4,200	0	1	10	23	31	36	0	33
	Subtotal for animals		47	2	303	365	456	224	42	668
	Plants	Vascular plants	Approx.7,000	20	5	1,044 564 + 480	621	145	52	0
Bryophytes		Approx.1,800	0	0	110	70	4	54	0	180
Algae		Approx.5,500	5	1	35	6	24	0	0	41
Lichen		Approx.1,000	3	0	22	23	17	17	0	45
Fungi		Approx.16,500	27	1	53	10	0	0	0	63
Subtotal for plants		55	7	1,264	730	190	123	0	1,994	
Total		102	9	1,567	1,095	646	347	42	2,662	

- (1) Data on the assessed animal species (including subspecies) were derived from the *Checklist of Japanese Species of Wildlife* 1993, 1995, and 1998 edited by the Environment Agency.
- (2) Data on the vascular plants (including subspecies) were gathered by the Japanese Society for Plants Systematics.
- (3) Data on the species of bryophytes, algae, lichen, and fungi (including subspecies) were derived from Environment Agency surveys.
- (4) Data on the current state of threatened species (including subspecies) were derived from the *Revised Red Data Book—Threatened Wildlife of Japan: Amphibians, Reptiles, Plants I, and Plants II* (edited by the Environment Agency in 2000), *Mammals and Birds* (edited by the Ministry of the Environment in 2002) and the *Red Lists on Brackish water and freshwater fish, Invertebrates (Insects, Land/freshwater shellfish, Arachnids, and Myriapods, Crustacea, etc.)* compiled by the Environment Agency in 1998, 1999, and 2000.
- The categories are as follows:
 Extinct: Species that are considered extinct in Japan
 Extinct in the Wild: Species that can only survive by being raised or by cultivation
 Critically Endangered + Endangered: Species in danger of extinction
 Vulnerable: Species facing increasing danger of extinction
 Near Threatened: Species with weak foundation for survival
 Threatened Local Population: Population of species that is isolated in an area and has high possibility of extinction.
- Source: Compiled by the Ministry of the Environment

Location of National and Quasi-national Parks

National park		Quasi-national park	
① Rishiri-Rebun-Sarobetsu	⑩ Sanin Kaigan	① Shokanbetsu-Teuri	⑩ Nishichugoku Sanchi
② Shiretoko	⑪ Setonaikai	② Abashiri	⑪ Noto Hanto
③ Akan	⑫ Daisen-Oki	③ Niseko-Shakotan	⑫ Kitangato Kaigan
④ Kushiro Shitsugen	⑬ Ashizuri-Uwakai	④ Otaru Kaigan	⑬ Akiyoshidai
⑤ Daisetsuzan	⑭ Saikai	⑤ Hidaka Sanmyaku-Erimo	⑭ Tsurugisan
⑥ Shikotsu-Toya	⑮ Unzen-Amakusa	⑥ Onuma	⑮ Muroto-Anan Kaigan
⑦ Towada-Hachimantai	⑯ Aso-Kuju	⑦ Shimokita Hanto	⑯ Ishizuchi
⑧ Rikuchu Kaigan	⑰ Kirishima-Yaku	⑧ Tsugaru	⑰ Kitakyushu
⑨ Bandai-Asahi	⑱ Iriomote	⑨ Hayachine	⑱ Hida-Kisogawa
⑩ Nikko		⑩ Kurikoma	⑲ Aichi Kogen
⑪ Joshinetsu Kogen		⑪ Minamisanriku-Kinkazan	⑲ Mikawan
⑫ Chichibu-Tama-Kai		⑫ Zao	⑲ Suzuka
⑬ Ogasawara		⑬ Oga	⑲ Muroo-Akame-Aoyama
⑭ Fuji-Hakone-Izu		⑭ Chokai	⑲ Biwako
⑮ Chubu Sangaku		⑮ Echigo Sanzan-Tadami	⑲ Meiji Memorial Forest Mimoo
⑯ Hakusan		⑯ Suigo-Trukuba	⑲ Kango-Ikema-Kisen
⑰ Minami Alps		⑰ Myogi-Arafune-Saku Kogen	⑲ Hyonosen-Ushiroyama
⑱ Ise-Shima		⑱ Minamiboso	⑲ Nagisan
⑳ Yoshino-Kumano		⑲ Meiji Memorial Forest Takao	⑲ Yamato-Aogaki
		⑲ Tanzawa-Oyama	⑲ Koya-Ryujin
			⑲ Hiba-Dogo-Taishaku

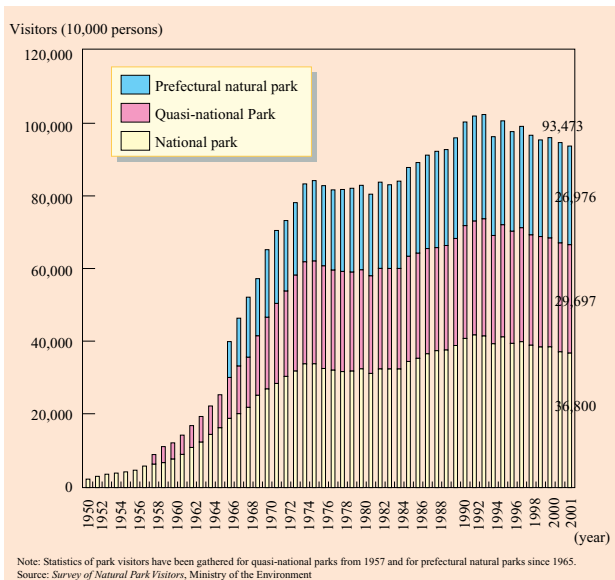
Source: Compiled by the Ministry of the Environment

wetland, the problem with invasive alien species, etc. (2) In addition to conservation, active “restoration of the nature” is proposed. (3) “Sustainable use” of various kinds of space, such as *satochi-satoyama*, is proposed. In other words, concrete, efficient measures are developed with these three pillars as a basic policy to promote regional biodiversity conservation.

Natural parks, including national parks, represent the excellent natural scenery of Japan. Based on the revision of the National Strategy on Biological Diversity, the Natural Parks Law has also been revised to include the establishment of a regulated utilization zones for the conservation and appropriate use of ecosystems; establishment of a scenic landscape protection agreement system to protect secondary natural scenery areas such as grasslands and *satochi-satoyama*; and a system to assign citizens’ groups as park management organizations. In addition, to promote the conservation of internationally important wetlands, Miyajima-numa and Fujimae-higata were added to the Ramsar List of Wetlands of International Importance in November 2002.

In addition, the restoration of the natural environment destroyed in the past has begun with the participation of experts, local authorities, NPOs and local residents. These projects include the restoration of meandering river in the Kushiro-shitsugen wetlands and the regeneration of coppice in Musashino at Kunugiyama in Saitama Prefecture. Furthermore, the Law for the Promotion of Nature Restoration was established recently, setting forth basic principles for the restoration of nature and concrete procedures for its promotion.

Changes in the Number of Natural Park Visitors



Systems for the law's smooth operation are being strengthened.

Besides those mentioned above, as a part of policy for conservation and management of wildlife, the bill to establish a system for the precise and smooth implementation of the Cartagena Protocol, which provides an international framework concerning export and import of living modified organisms, is being submitted to the Diet.

7. Conservation of Global Environment

(1) Transboundary Movements of Hazardous Waste

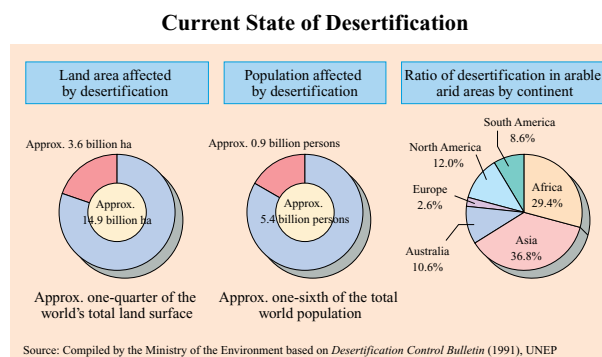
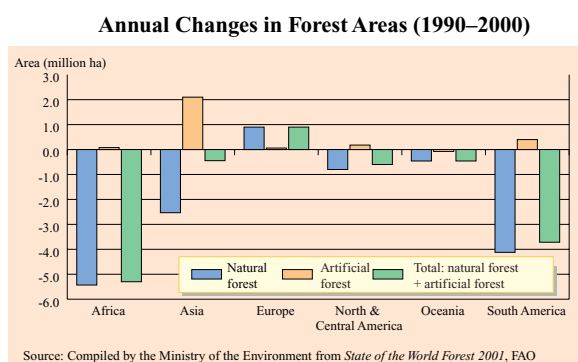
There are global environmental problems other than global warming, destruction of the ozone layer, acid deposition and pollution of the oceans discussed so far. From the 1970s to the 1980s, developed nations exported toxic waste materials to developing nations with looser regulations and cheaper processing fees where the waste was inappropriately treated or illegally dumped, causing environmental pollution. There were also repeated occurrences of ships carrying toxic wastes drifting on the ocean without a destination because they had been denied permission to unload. With this backdrop, the problem of transboundary movement of hazardous wastes became recognized by the international community as requiring global efforts. In 1992, the Basel Convention came into effect. As of March 2003, 155 nations including Japan, and the EC had joined the Convention.

(2) Deforestation

Forests have multiple functions, including the provision of living and breeding grounds for wildlife and the absorption of carbon dioxide. From 1990 to 2000, approximately 94 million hectares of forests disappeared in the world. Because of this, the importance of conservation and sustainable management of forests, including combating illegal logging, has been recognized. In 2000, the United Nations Forum on Forests (UNFF) was established and since then has been involved in the promotion and implementation of a number of proposals for action.

(3) Desertification

Besides the aridity of the soil, desertification includes soil erosion, salinization and the decrease of natural plant species. Desertification is a global problem. According to a UNEP survey, about 1/4 of all land area in the world is subject to the influences of desertification, which is about 70% of the arable arid area, affecting about 1/6 of the world's population or 900 million people. For this reason, the UN Convention to Combat Desertification (UNCCD) came into effect in 1996, and currently many measures are proceeding to effectively implement this convention.



Measures to be Implemented in FY 2003

In the *Quality of the Environment in Japan 2003*, the environmental conservation measures that are planned for FY 2003 based on the Basic Environment Plan are reported in the structure shown below.

- Chapter One: Measures for Various Environmental Problems
- Chapter Two: Basis of Various Measures, and Measures Facilitating the Participation of Various Actors
- Chapter Three: Promotion of International Activities
- Chapter Four: Effective Implementation of the Basic Environment Plan



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 If you have any opinions and comments regarding this booklet, please contact the following:

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