

**ECONOMIC DEVELOPMENT:
ENVIRONMENTAL
DEGRADATION OR PROTECTION?
AN ANALYSIS OF THE JAPANESE CASE**

A Thesis Presented by Aysegül SOMUNKIRAN

to

The Institute of Economics and Social Sciences

In Partial Fulfillment of the Requirements

For the Degree of M.A.

In the Subject of International Relations

*Bilkent University
January, 1994*

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I certify that I have read this thesis and in my opinion it is fully adequate, in scope and in quantity, as a thesis for the degree of Master of Arts in International Relations.



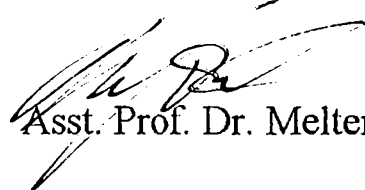
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Asst. Prof. Dr. Meltem MÜFTÜLER



Approved by the Institute of Economics and Social Sciences.

ABSTRACT

The idea of material progress has been equated with man's free use of nature, or rather separation of man from nature. The evolution of the advanced industrialized societies involved a deep transformation in every respect of life. The development of its fundamental principles and attitudes produced, from the 18th century on, an increased range of human power over nature, which is turning environmental problems such as ozone depletion, global warming, tropical forest destruction, and air and water pollution, into life threatening issues not only for the world's species of flora and fauna but for humans as well.

In the light of these developments, the traditional Western philosophy of man's exploitation of nature and its resources began to be questioned and revised. This trend was visible especially in the industrialized countries which were once the champions of the traditional view. Such revision of the traditional approach has started to show its reflections in the environment-related behavior of these countries. Whereas, in the initial stages of economic development, industrialized countries did not take environmental concerns into account, they have had to change their attitude and adopt a more environmental-concerned stance later as a result of domestic and/or international pressures. The Japanese case is illustrative of this trend. Although Japan was a latecomer into the world of industrialized countries. It caught up with its rivals in a short period and demonstrated the negative environmental side effects of the Western style of economic development associated with industrialization. However, recent policies in this country reflect a growing concern for global environmental protection.

ÖZET

Maddi ilerleme fikri, insanın doğayı serbestçe kullanımı, hatta kendini doğadan soyutlaması ile eş tutulmuştur. İleri endüstri toplumlarının gelişmesi insan hayatını her yönüyle değiştirmiş, 18. yüzyıldan bu yana süren bu değişim sonucu ortaya çıkan prensip ve tutumlar insanın doğa üzerindeki etkisini arttırmıştır. Sonuç olarak ortaya çıkan hava ve su kirliliği, tropik ormanların yok olması, ozon tabakasının delinmesi, dünyanın ısınması gibi çevre sorunları yalnız bitki ve hayvan türleri için değil, insanlık için de tehdit edici boyutlara ulaşmıştır.

Bu gelişmelerin ışığında, insanın doğayı ve kaynaklarını kullanmasında dayalı geleneksel Batı felsefesi sorgulanmaya ve yeniden gözden geçirilmeye başlanmıştır. Özellikle bir zamanlar bu görüşün savunucuları olan endüstrileşmiş ülkelerde belirgin olan bu eğilim, bu ülkelerin çevreyle ilgili tutumlarında da kendini göstermeye başlamıştır. Ekonomik gelişmelerinin ilk dönemlerinde çevre konularını dikkate almayan endüstrileşmiş ülkeler daha sonra iç ve/veya dış baskılar sonucunda tutumlarını değiştirmek ve daha çevreci bir konum benimsemek zorunda kalmışlardır. Japonya örneği, bu eğilimi sergilemektedir. Japonya, endüstrileşmiş ülkeler dünyasına geç katılan bir ülke olmakla birlikte, kısa sürede rakiplerini yakalamış ve bu arada da endüstrileşme ile özdeşleşen Batı tarzı ekonomik gelişmenin olumsuz çevre etkilerini de sergilemiştir. Bununla birlikte, son zamanlarda benimsediği politikalar, bu ülkede de çevre koruması konusunda giderek artan bir ilginin varlığını göstermektedir.

ACKNOWLEDGEMENTS

This thesis has been made possible by the generous supports of many people and organizations, whose contributions I greatly appreciate. It is impossible to overestimate the importance of their support.

Heartful thanks, therefore, to:

- Asst. Prof. Dr. Gülgün TUNA, to whom I have incurred a particular debt of gratitude for her patient guidance through my study with her valuable comments and helpful suggestions. I also owe special thanks to my supervisor for her kind appreciation and encouragement;
- Prof. Dr. Kemali SAYBAŞILI and Asst. Prof. Dr. Günay Göksu ÖZDOĞAN, to whom I am deeply grateful for giving encouragement and a supportive hand to me for starting this study and for their courtesy;
- Asst. Prof. Dr. Ömer Faruk GENÇKAYA, to whom my special thanks go for his illuminating comments and recommendations;
- I am also grateful to Prof. Dr. Ali KARAOSMANOĞLU and to the Department of International Relations;
- INFOTERRA/UK National Focal Point; INFOTERRA/ Japan National Focal Point; Global Environment Department, Environment Agency, Government of Japan; Greenpeace; JAVA (Japan Anti-Vivisection Association); Ministry of Foreign Affairs, Government of Japan, Multilateral Cooperation Dept., Global Issues Division; Japan Environment Association; The Tokai Bank Ltd, Economic Research Department; JANIC, Japanese NGO Center for International Cooperation/Japan; KEIDANREN, Japan Federation of Economic Organizations/Japan; UNEP, United Nations Environment Programme/France; JICC, Japan Information and Cultural Centre, Embassy of Japan, London; ENFO, The Environmental Information Service/Ireland; EARTHWATCH, The Irish Environmental Organization; The Commonwealth Collection/England; FSC, Field Studies Council/England; Friends of the Earth/Japan; IIED, International Institute for Environment and Development/England;

- Mike THOMAS of The Future in Our Hands/England; Japan Animal Welfare Society; RAINBOW, Resource Centre/England; BBC Wildlife Magazine/England; The British Ecological Society; ENDS, Environmental Data Services/England; Institute for Japanese Renaissance; National Institute for Environmental Studies/Japan; JICA, Japan International Cooperation Agency; Mr. OKAMURA of Embassy of Japan/Ankara;
- In particular, the contributions of Katsumi KUROSAWA, the Chairman of Ankara Japanese Association are greatly acknowledged.

Finally, I thank Doruk, my spouse, for the very substantial support which he has given me throughout the work which this thesis has entailed.

Ayşegül SOMUNKIRAN

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CHAPTER 1

INTRODUCTION

Human history is the story of the increasing ability of human societies to dominate and exploit the environment to meet their needs and of the consequences for the environment of doing so. The extent and severity of human impact on the environment depends on the way societies organize economic production. From all but the last few thousand years of their two million years' existence - in other words, for ninety nine percent of their history - human societies lived as hunter-gatherers in the form of small and mobile groups. It was this basic form of subsistence that was to last as the human way of life until the development of agriculture about 10,000 years ago. That was the first great transition in the history of the human-being. The emergence of the industrialized societies constituted the second.

From the Western perspective, the invention of more complicated production processes, and thus the utilization of more natural resources can be viewed as progress - the increasing ability of human societies to control and to alter the environment to meet their needs. In this context, progress has always been, by definition, beneficial and something for which all human societies should aim. However, somewhere along the way in the unrestrained pursuit of progress, guided by scientific knowledge and, above all, with economic development, there must be something seriously wrong that the same process, from another perspective, appears as a succession of more complex and environmentally damaging ways of meeting the same basic human needs (1).

Although environmental problems are nothing new, they were often treated superficially until recently. However, the continued tremendous increase in the scale of human impact on the earth, together with our increased, although still highly imperfect, understanding of ecological processes, makes the environment an issue that can no longer be viewed as a relatively stable background one. Indeed, the issues of the environment together with those of the world's economy and of international security constitute the three major issue areas in world politics and are deeply intermeshed: "until death do them part", to quote one of Canada's industrial leaders (2). This is the new reality of the century, which carries profound implications for the future (3).

Growth in five areas; in population, food production, industrialization, pollution, and consumption of non-renewable resources; which seems to be problematic on a world-wide scale, continues in an unprecedented rate (4). Today, the world, in C. Ponting's words, is "on history's fastest growth track" (5). On the other hand, existing measures for the protection and conservation of the environment, compared with the scale of the problems, have barely led to significant changes in practice. The limited achievements of the past few decades have been very rarely led by the economically developed, richer industrialized countries (i.e. the countries in Western Europe, in North America and Japan) and that, when it was in their interest to do so (see Table 1.1).

Table 1.1: The Position of the Industrialized Countries toward Some of Environmental Issues

Issue	Key Veto States	Basis of Veto Power	Changes in the Position of the Veto States
Acid Rain	Germany	Percent of Emissions	Joining the 30 % Club
Ozone Depletion I	EC Commission	Percent of CFC Production	Agreeing to 50 % Club
Ozone Depletion II	EC Commission	Percent of CFC Production	Agreeing to Phase Out
African Elephant Ivory	Japan	Percent of Imports	No Reservation to Cites Uplisting
Whaling	Japan	Percent of Catch	No Unilateral Resumption of Whaling
Hazardous Waste Trade	United States, EC, Japan	Percent of Exports	Agreeing to Ban Exports to AFC States

Source: Gareth Porter and Janet W. Brown, Global Environmental Politics (Boulder: Westview Press, 1991)

This fact is the starting point of this study: the purpose of this thesis is to describe the traditional environmental policies and attitudes of developed countries and to find out the prospects for change in those policies and attitudes in the near future. Until recently, attitudes of the industrialized countries towards environmental issues could be more readily interpreted as ways of supporting the existing economic system than the first steps of something new and different. However, some recent changes in the attitudes of these countries suggest that they might be on the way of putting aside their long-lasting preoccupation with the aim of unconditional economic development, and of moving towards a more determined position to develop more realistic, serious and action-oriented solutions to environmental problems. Japan is a case in point. It constitutes a unique example to demonstrate the extent of the

accuracy of the above suggestion. It has been chosen as a case study in this thesis for two basic reasons: 1) Japan, by virtue of the size and structure of its economy and strength of its industrial sector, can be considered as representing the industrialized countries; 2) Whereas not more than a few decades ago, Japan had a reputation as the ecological predator, an examination of its recent approach to environmental issues reveals a sharp contrast.

Grasping the reasons and dynamics of this radical contrast may contribute to the testing of the suggestion that the industrialized countries in general might be moving toward a more protectionist stance concerning global environmental issues. In this context, it might be useful to elaborate some more on these two reasons:

Perhaps the most interesting position in terms of the development of nation states and global environment is currently occupied by Japan. It is a country made up of four main and several minor islands, most of which are covered by mountains, leaving only approximately 20% of the land flat, thus usable, with a relative scarcity of natural resources in addition to the increasing population. Despite all this, Japan has been the second non-European state to achieve the position of a modern industrial power in Western terms. Its advancement from being another late-developing, Asian economy, to the forefront of nations, just after the US, has taken place within 35 years - only a generation's time (6). However, to understand the real basis of this advancement, one should go back to the period - the so-called modern period - when the feudal system was replaced by a reform known as Meiji Restoration.

While ensuring a place for itself which accounts for 10% of the world economy, Japan depended -and still depends- extremely on the globe for many resources, and imposed -and still continues to impose- a wide variety of burdens on it. Japan was completely careless about the environmental consequences of its economic activities, a type of attitude which, brought it another reputation besides its economic miracle: to be one of the worst offenders against the protection of global environment, "the ecological-predator" (7). The extent of its carelessness was such that, finally, it began to get world-wide reactions. To quote H. Maull:

"As a result, it has been singled out by transnational groups, such as Greenpeace, and the World Wildlife Fund as a prime target. On one such occasion, during the IMF/ World Bank meeting in Berlin...Japanese bureaucrats and bankers were exposed to a barrage of demonstrations and heckling" (8).

Only recently has Japan started to show signs of greater consideration for environmental protection. There are three reasons for this:

1. As a result of growing economic activities, Japan realized that the world is not only made up of the Japanese islands and they have to share this world with the others;
2. Consequently, they saw that they were not isolated from global environmental problems, in the occurrence of which they also had

a share, in contrast, these problems put their land and, more importantly, their life at stake as well;

3. Japan's government began to face more and more reflections of the growing environmental consciousness. This was impressed on the government through international organizations, intergovernmental conferences and both domestic and foreign public opinion.

For our purpose, it will be useful to find out whether the recent changes in Japan's attitudes regarding global environmental issues are strong enough to imply a departure from its traditional ego-centric approach. If so, then, we shall try to assess the value and significance of this change as a possible general pattern in the industrialized world.

In order to present a comprehensive analysis, extensive use has been made of publications and documents from several organizations, directly or indirectly related with the environmental issues, governmental and non-governmental. Journal articles and other scholarly works on economic development, environmental protection and the Japanese case were also reviewed.

The thesis is organized around four themes. The first one, taken up in Chapter 2, involves the mentality and attitude traditionally adopted by the industrialized world towards environmental issues. This chapter also includes the well-known debate on population growth versus industrial affluence regarding their impact the environment, with a brief review of the relevant

scholarly literature. Chapter 3 is an analysis of the Japanese experience regarding its economic development and the environment following World War II. Chapter 4 describes the recent changes in Japan's global environmental policies through examining the changes which occurred in the approach of the main segments of the Japanese society; the government, the enterprises and the citizens. In Chapter 5, an attempt is made to assess the value and significance of this change and its generalizability in the industrialized world. The thesis ends with an assessment of the prospects for a transformed mentality towards nature.

CHAPTER 2

INDUSTRIALIZATION AND THE ENVIRONMENT: A REVIEW OF THE LITERATURE

It is the way in which human beings have thought about the world around them that legitimizes their treatment of it and provides an explanation for their role within the overall structure. Therefore, an attempt to assess the value and significance of the recent changes in Japan's attitude towards environmental issues, in the world of the industrialized countries, requires, before anything, a better understanding of the way that the industrialized countries have approached nature:

2.1 The Traditional Western Approach to Nature:

The way of thinking about the world, which became dominant in the last few centuries dates back to the ancient times -to the influence of the philosophers of ancient Greece and Rome and the ideas of the Christian Church- originating in Europe. This view is composed of many different traditions - philosophical, religious and scientific - and they have been channeled in many different ways. It places humans in a special position, above and beyond a separate "natural world" which they can exploit with impunity. Thus, higher levels of consumption and a greater ability to alter the natural world are regarded as major achievements (9).

Since the ancient times, many thinkers have looked at the world around them and this has led them to think that every part seems to have a role and purpose within an overall plan. For them, such a plan can only have been conceived by a God, or the gods and they have gone on to speculate about the positions of humans within this plan. For Socrates, everything about humans (such as the eyes and hands) has a purpose and the gods have also provided everything carefully for the benefit of the man. Another early expression of this view is to be found in Aristotle. In The Politics, he argues that plants are made for animals and concludes with the statement that, "now, if Nature makes nothing incomplete, and nothing in vain, the interference must be that she has made all animals for the sake of the man" (10).

The classical thinkers were well aware that human actions were changing the world around them, such as Herodotus, Xenophon but the most graphic description of this change was left by Plato in his Critias: "there were some mountains which now have nothing but food for bees, but they had trees not very long ago" (11). But apart from those who saw human history as a story of decline from a past golden age, like Xenophon and Hesiod, they generally regarded human actions in modifying the environment as perfectly natural and beneficial (see Appendix A).

The rise of Christianity and its adoption as the state religion of the late Roman empire in the fourth century did not introduce anything new to the relationship between the human and nature. For the early and medieval Christian thinkers, God had given humans the right to exploit plants, animals and the whole world for their benefit (12). Thomas Aquinas

argued that there was a hierarchy of beings from the most insignificant up to God, humans took their unique place above the animals and their domination over nature was part of the logical divine plan - rational creatures should rule over irrational ones (animals) and this was well illustrated by the human ability to domesticate animals (13). The Reformation in the sixteenth century brought no fundamental change in this point of view, indeed by re-emphasizing the importance of biblical texts intended to reinforce it. Calvin, one of the leaders of the movement, stands firmly behind the view that God "created all things for man's sake" (14).

The increasing rapid development of secular thinking in Europe from the sixteenth century produced little alteration in the assumptions and beliefs inherited from the early ages about the relationship between humans and the natural world. One of the major themes of seventeenth century writings was the emphasis placed on human domination over nature and their role in completing God's work. At this time, a slowly developing scientific method and a growing body of scientific knowledge were working in the same direction. Descartes in his Discourse on Method emphasized the importance of scientific method through the use of mathematics to measure and quantify, together with a process of analysis designed to reduce wholes to their constituent parts. The widespread adoption of this reductionist approach to scientific enquiry was to have a profound impact on the shaping of European thought generally. It inevitably led to a fragmented view of the world - to a focus on the individual parts of a system rather than on the organic whole . Whatever new intellectual methods Descartes wanted to pursue, God was still central

to this view of the world, and humans still occupied a special place in that scheme, set apart through the possession of minds and souls which enabled them to dominate nature (15).

The idea that the application of science is a vital tool to enable humans to dominate the world is strongly expressed in the work of Francis Bacon. He started from the traditional view when he wrote that "the world is made for man, not man for the world", and:

"Man...may be regarded as the center of the world, insomuch that if man were taken away from the world, the rest seem to be all astray, without aim or purpose" (16).

He continued to urge the application of science to restore the humans' domination over the world that had been lost with the fall of Adam and Eve in the Garden of Eden. As he wrote in the Novum Organum: "let the human race recover that right over Nature which belongs to it by divine bequest" (17).

During the second half of the eighteenth century the idea of a perfectly designed world came under attack, notably in Voltaire's Candide. This vein in the work of philosophers was assisted by later developments in scientific thought. Charles Darwin's Origin of Species, published in 1859, opened up a debate about the origins of man, undermined the orthodox view of divine creation and put forward the idea of the natural selection of characteristics that helped survival in a highly competitive world. Humans had to struggle against nature in order to survive and in doing so demonstrated their fitness to be on the topmost rung of the ladder (18).

Although the religious element had dwindled or disappeared from much of European thought by the end of the nineteenth century, many of the assumptions that lay at the center of Christian thought had been incorporated into the general pattern of assumption, that formed the foundations of the European view of the world, justifying not only the areas of traditional human interference with the natural world but also new activities such as the vast increase in industrial output. The philosopher Immanuel Kant wrote that, "as a single being upon earth that possesses understanding, he [man] is certainly titular lord of nature... he is born to be its ultimate end" (19). Given this position, Kant felt that the human relationship with nature could not be subject to any moral censure. Other familiar views also appear again in only slightly different guises in a number of modern thinkers. For example, the founder of psycho-analysis, Sigmund Freud, said in Civilisation and Its Discontents that the human ideal was "combining with the rest of the human community and taking up the attack on nature, thus forcing it to obey human will, under guidance of science" (20).

While the influence of Western religious, philosophical and scientific thinking was affecting the way in which Europeans, and increasingly the rest of humanity, viewed the world around them, the growth of the discipline of economics provided another perspective to look at the world. As C. Ponting points out:

"Economic thinking is now central to the way in which human societies threat the environment. Not only the professed economic system of a society, but the hidden

assumptions of economics and the value systems that it enshrines, are central to understanding the modern view of the relationship between humans and the natural world" (21).

The first writer to provide a systematic analysis for the revolution in behaviour and social organization that was taking place was Adam Smith in his Inquiry into the Nature and Causes of the Wealth of Nations, published in 1776. He argued that the betterment of society was equivalent to the production of material wealth. Smith, together with other writers such as Ricardo and John Stuart Mill, (now categorized as classical economists) placed the production of goods at the center of the economics (22). Their assumptions have, over the last two hundred centuries, been widely accepted in industrialized societies. One of their main assumptions is that earth's resources are treated as capital - a set of assets to be turned into a source of profits. Trees, minerals, water and soil are treated as commodities to be sold or developed. More important, their price is simply the cost of extracting them and turning them into marketable commodities (such as air never even enter a market mechanism) (23). This view overlooks the basic truth that the sources of the earth are not just scarce, but they are finite. Again as Ponting states:

"Since classical economics is unable to incorporate this fact into its analysis, the economic systems based upon it encourage both the producer and the customer to use up available resources at whatever rate current conditions dictate...The development of Keynesian economics in the

1930s...brought...new methods for measuring the level of economic activity in a country. Economists evolved Gross National Product (GNP) as a measure of the amount of production, consumption and investment. The success of an economy is now generally judged by the rate at which GNP is increasing. But the way that GNP is defined has a number of defects. It does not measure every sort of economic activity and the way it is calculated provides a distorted view of economic success. GNP only measures certain monetary flows within an economy and, therefore, cannot cover the "black economy" of undeclared activities or non-monetary transactions such as barter, subsistence agriculture, housework and voluntary community work. GNP, measuring the size of an economy, includes many items that are not benefits to society as a whole. For example, the shorter the life of cars, and the more they often break down, the greater will be the amount of activity in an economy (more car sales and more repairs) which is reflected in GNP figures...GNP calculations also take no account of the social costs of some form of production, such as higher levels of pollution or greater traffic congestion...It is difficult to put a price on such items, and they are left out of most economic models and pricing mechanisms, reduced to a category of externalities" (24).

As it is apparent, the relationship between the human and nature is defined, from the very beginning, as a battle. And the idea of material

progress has been equated with man's free use of nature, or rather, separation of man from nature. The evolution of the advanced industrial society involved a deep transformation in every respect of life. The development of its fundamental principles and attitudes produced, from the eighteenth century on, an increased range of human power over nature (25).

Dr. F. Schumacher, in his book, Small is Beautiful, comments on the battle between the human and nature as follows:

"Until quite recently, the battle against the nature seemed to go well enough to give him [human-being] the illusion of unlimited powers, but not so well as to bring the possibility of total victory into view. This has now come into view, and many people, albeit only a minority, are beginning to realize what this means for the continued existence of humanity" (26).

As Schumacher points out, the possibility of total victory has come into view as a prize of the unprecedented development that human beings achieved during the 20th century. However, the ushers of this prize have been accompanied with the unmistakable signals of the world - such as the ozone hole, global warming, acid rain, deforestation, pollution of oceans among others : The ultimate reminders that humans too are part of nature. Thus, winning the battle means, in fact, losing it.

2.2 The Environmentalist Approach to Nature:

The warning signals of the world are nothing new, the extent and severity of which have increased dramatically in the latter half of the 20. century, together with the increase in the world's population and economic activity. As one report points out:

"Since 1900, the world's population has multiplied more than three times. Its economy has grown twentyfold. The consumption of fossil fuels has grown by a factor of 30, and industrial production by a factor of 50. Much of that growth, about four-fifths of it, occurred since 1950" (27).

For the changes wrought by these developments, while Western industrial countries tend to see the excessive population growth in the developing countries as the main culprit; developing countries claim that industrialization, which is seen at the centre of economic development, is the real one to be blamed.

All the nations, both industrial and developing, impose large burdens on the earth's environmental system. Some do so through wealth, some through poverty, some through large and growing populations, others through high and rapidly growing levels of consumption of environmental resources. The aggregate impact of any community on the environment can be thought of as the product of three factors: Its population; its consumption or economic activity per capita; and its material or energy flow per unit of economic activity (28).

The excessive population growth in the developing countries, doubtlessly exerts great pressure on the environment, and contributes to destruction of the global commons. However, it is not the population growth rate per se but the total world population multiplied by per capita consumption that determines the rate of environmental disruption. And, the highest per capita consumption of energy (see Table 2.1) and other resources is found in the most industrialized countries:

Table 2.1: Global Per Capita Energy Consumption, 1984

World Bank GNP Economy Category	GNP Per Capita	Energy Consumption (kW per capita)	Mid 1984 Population (millions)	Total Consumption
Low Income	260	0.41	2390	0.99
Sub-Saharan Africa	210	0.08	258	0.02
Middle Income	1250	1.07	1188	1.27
Lower Middle	740	0.57	691	0.39
Upper Middle	1950	1.76	497	0.87
Sub-Saharan Africa	680	0.25	148	0.04
High Income Oil Exporters	11250	5.17	19	0.10
Industrial Market Economies	11430	7.01	733	5.14
East European Non-market Economies		6.27	389	2.44
World		2.11	4718	9.94

Source: The Brundtland Report (1987): based on World Bank, World Development Report 1986. (New York: Oxford University Press, 1986).

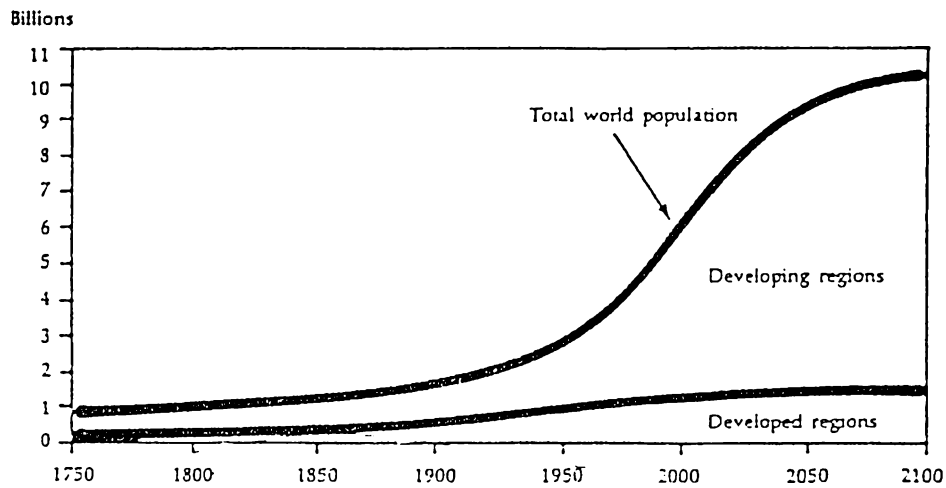
"The developed capitalist countries, with a sixth of the world's population, account for 54% of the world's manufacturing industry and consume more than half of the world's energy. The Third World, with almost four-fifth of the world's people, produces only 14% of its manufacturers and consumes only a quarter of world energy" (29).

The gross world product (GWP) - the total goods and services produced throughout the planet - is growing in a far faster rate than the world's population and it is mainly concentrated in the industrialized countries (see Figures 2.1 and 2.2). It has been estimated that the extra output in the world each decade after 1950 is equal to the whole output of the world before 1950 (30).

Together with the vast increase in the industrial output, pollution levels have also risen. And, this rise, by the latter half of the 20th century, has been far faster than the increase in population and even the increase in material consumption in the industrialized countries (31). Pollution has not only spread to every part of the world but it has begun to affect the global mechanisms that make life on earth possible.

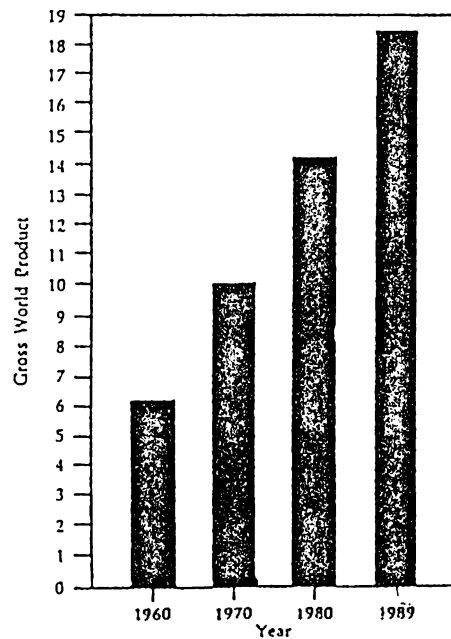
On the other hand, human understanding of the consequences of pollution has always tended to lag behind the release of industrial pollutants into the environment. There are mainly two reasons for this: the perception of pollution as an inevitable concomitant of industrialization and economic development - a price to be paid for the advantages derived from the goods produced and the wealth generated; and the tendency to see

Figure 2.1: Growth of World Population



Source: Population Bulletin, 42 (July, 1987): 9.

Figure 2.2: Estimated Gross World Product (GWP), (in trillions of Dollars)



Source: 1960-80 estimates from CIA, Directorate of Intelligence, Handbook of Economic Statistics, (Washington D.C.: CIA, 1988): 2; 1989 estimates from CIA, CIA World Fact Book, (Washington D.C.: CIA, 1989): 324.

the environmental costs as external to that of development. In this respect, it would be hardly wrong to link the history of all, but few, if any, environmental problems, that we face today, to today's basic industrial processes (32).

As the matters stand, environmental problems seem mainly to be problems of economic development. And industrialization, being at the centre of economic development, appears to be the activity that places "the greatest strain" on the earth, rather than the growing masses in the developing countries (as one example, see Table 2.2).

Table 2.2: Share of World's Carbon Emissions, Population, and GNP , 1986

	Emissions	Population	Output
North	61.8	24.3	78.8
South	38.2	75.7	21.2
Developed	50.7	15.6	74.8
Developing	42.8	80.6	22.2
Oil Exporting	6.4	3.7	3.0

Source: The World Bank, International Trade and the Environment, (Washington, D.C.: The World Bank, 1992).

The concept of environment now brings with it a whole range of images and connotations that come from the early days of the Industrial Revolution in Britain (33). Those who looked at the world from the environmentalist perspective, developed a rich and critical literature,

which represents a variety of images of social deprivation alongside environmental degradation, brought about by the unrestrained forces of industrialization. What much of the writings had in common was a dislike, ranging from muted distaste to outright condemnation of industrialization or "Industrialism", a concept which denotes the wider social transformations associated with industrialization (34).

Much of the base inspiration to these writings was provided by the writings of Thomas Malthus 200 years ago (Malthus, 1789). Malthus worried about the miseries that would arise when the number of humans exceeded the ability of the land to produce food (35). Humanity's intensified, varied and spreading economic activities to overcome the limits that the environment poses, have appeared as the most condemned vehicle leading to these miseries.

There was a wide range of diversity of political beliefs which ranged from romantic notions of returning to some sort of pre-industrial rural idyll, through the Utopian socialist visions of W. Morris (The Art of the People, 1879) and P. Kropotkin (Fields, Factories and Workshops, 1899); to the revolutionary socialism of Marx and Engels (Dialectics of Nature, 1889). For Morris, the only way to prevent the "wastefulness of industrial and agricultural production", is to return to a simple form of life, in other words, to eliminate "the complicated forms of production" (36).

The modern environmentalist movement can be said to have started in the late 1960s and early 1970s, and led to the formation of pressure groups like Friends of the Earth and Greenpeace which were openly

committed to direct political involvement. Their message, while being an overtly political one, was scarcely new in that it regarded the only way of preventing environmental and ecological catastrophe as changing fundamentally the materialist and consumerist values of industrialized societies, similar to the views of Morris mentioned above (37).

Starting with Rachel Carson's Silent Spring (1962), warning of the dangers of the indiscriminate use of modern chemicals and their consequent damages to the environment and Garrett Hardin's The Tragedy of the Commons (1968), the early 1970s witnessed a literary boom in doom and gloom with titles like The Population Bomb; How to be a Survivor; The Environmental Crisis; Economic Growth and Environmental Decay; Blueprint for Survival; and Small is Beautiful . In 1972, these predictions of impending crisis due to unlimited growth in population and industrialization found international recognition with two significant events: the publication of The Limits to Growth, produced by the Club of Rome, an informal, non- political, international group of scientists, humanists, economists, educators, bankers and industrialists, who shared a deep concern about the problems threatening human society and the United Nations Conference on the Human Environment in Stockholm (38).

However there were still ones who did not share these views. W. Oates and W. J. Baumol (1975), in their book, The Theory of Environmental Policy, claimed that there simply was no evidence of general environmental deterioration as a consequence of growing economic activities (39). M. Radetzki has been the one to echo their views in the 1990s:

"There is a tendency in current debates to regard all human intervention with the environment as damaging. In my opinion, this is a fallacious view... Only part of human interference with environment has had the form of undesired spillovers, or was unintentionally negative. A larger part has had the express aim of reshaping the original environment conditions to suit the needs of our species. This is one important reason why environmental quality appears to have improved - not deteriorated - with increasing economic activity" (40).

C. Ponting, in one of his works, The Green History of the World, claims that a political, social or cultural history of the 20th century, and particularly the last few decades of the century, might well record a growing awareness of the fact that our current environmental problems are mainly the responsibility of economic growth, consumerism, greed and selfishness, all of which are associated with the process of development in the industrialized world (41).

However, as we stand by the turn of a new century, being economically developed and preserving the environment do not necessarily seem to be conflicting goals any more. The Japanese experience as regards economic development and the environment is a graphic example of this fact. What does this mean in macro terms? In other words, in the light of the Japanese experience could we suggest that "there is a strong probability that the members of the industrialized world, in the long-run, may be expected to transform into environmental protectors?"

Explaining where Japan stands today in relation to global environmental issues and assessing how far the Japanese case is an example to imply the emergence of a new kind of approach, put differently, the first signals of the beginning of a change in the traditional attitudes of the industrialized countries towards environmental issues, requires some explanation of how Japan arrived at that point; for which we have to start with an analysis of the Japanese experience in relation to economic development and the environment.

CHAPTER 3

ECONOMIC DEVELOPMENT AND THE ENVIRONMENT: THE JAPANESE EXPERIENCE

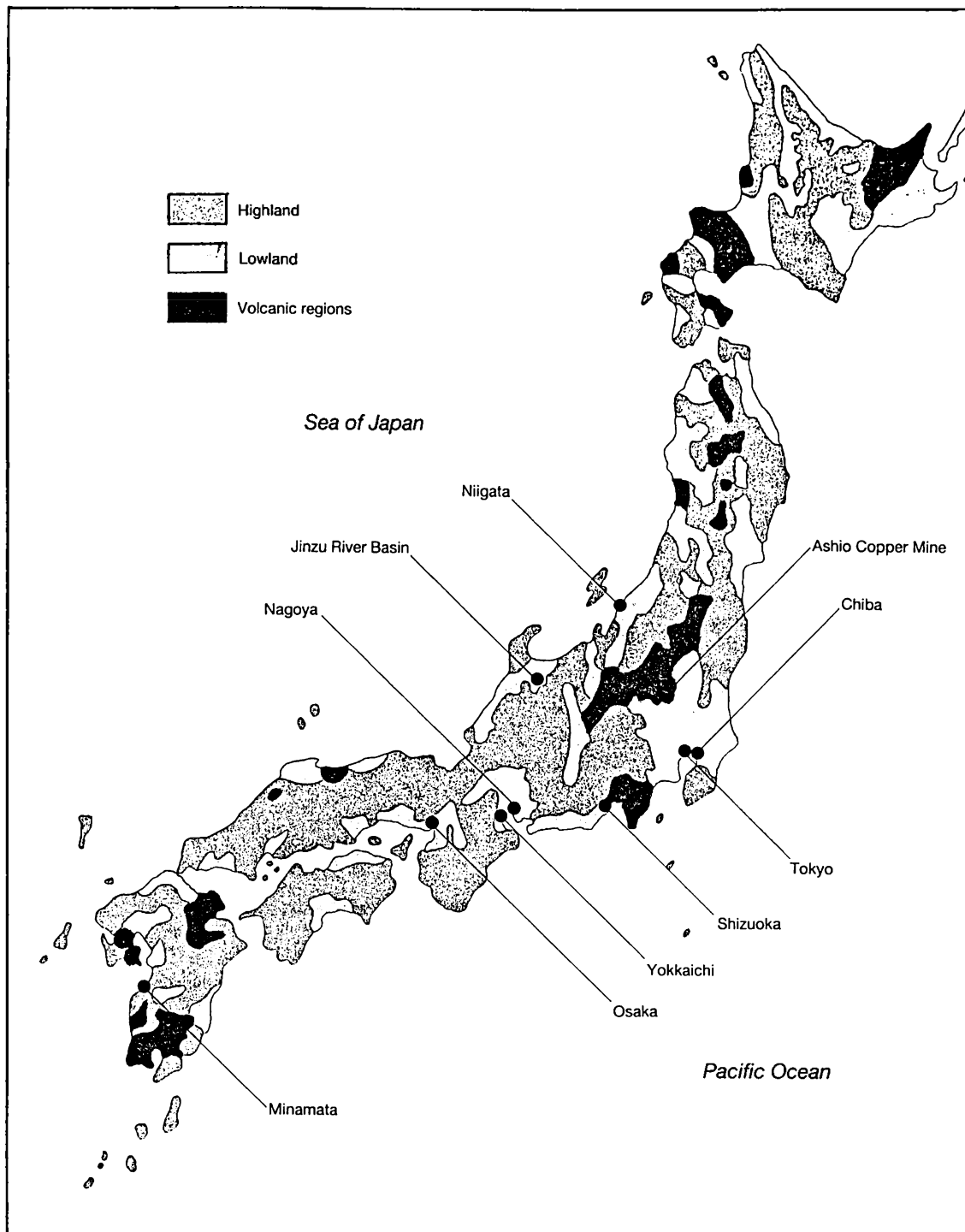
To examine the Japanese experience regarding economic development and the environment, it is appropriate, in our conviction, to start with an analysis of the historical evolution of Japan's economic rise.

3.1 The Japanese Case of Economic Development

a) The Rise of Japanese Power

Japan is a collection of four main islands (Hokkaido; Honsyu; Kyuusyu; and Shikoku) and several minor ones located off the eastern coast of the Asian continent. For centuries it had been ruled by a decentralized feudal oligarchy consisting of territorial lords (daimyo) and an aristocratic caste of warriors (samurai). Encumbered with the relative scarcity of natural resources in a limited land area (see Figure 3.1) where the population was rapidly increasing, Japan lacked all of the traditional prerequisites for economic development. The Japanese people remained inward looking and resistant to foreign influences until the second half of the nineteenth century because of their isolated stance from the rest of the world. It was the natural result of not only their geographical position, but their complex

Figure 3.1: Japan's Topography and Selected Places



Source: Ministry of Foreign Affairs, Economic Development and the Environment, (1992), 3.

language with no close relatives and their unique culture as well. For all of these reasons, Japan seemed destined to remain politically immature, economically backward, and militarily insignificant (42).

Yet, in spite of these obstacles, this isolated nation was to become the second non-Western state to achieve the position of a modern industrial power by the beginning of the twentieth century. Japan's rapid rise to a world power began in January 1868, when a political revolution swept aside the authority of the feudal oligarchy and restored the position of the Meiji Emperor as the symbol of national unity and centralized authority (43). The complete commitment of the new ruling elite itself to the transformation of Japan from a primitive feudal society into a modern world power, through abandoning the isolationist prejudices of the past in favor of Western methods of political, economic and military organization, brought about the phenomenal success of the so-called Meiji Restoration (44). The reason underlying this earnest commitment was, as Keylor noted, the belief of the Meiji political class that since the global power of European nations was the result of their economic modernization, political centralization and military organization, the best way of resisting European domination was to adopt the practices that made their supremacy possible (45).

The result of this willingness for catching up with the West by imitation was the rapid Westernization of Japan during the closing decades of the nineteenth century. While Japan was emerging as the dominant power in East Asia, across the Pacific another non-European

state, the United States, that had adopted European ways began to emerge in the new global order (46). As Keylor pointed out:

"The simultaneous emergence of these two powers on the opposite shores of the Pacific inevitably raised the possibility that their aggressive ambitions would overlap in that ocean "(47).

Although there were enough reasons that could easily lead two countries to a direct confrontation as the century was turning out,

"...the Pacific ambitions of Japan and the United States were prudently postponed by the governments of both countries and subordinated to expansionist activities in regions closer to home" (48).

This was the tendency in the 1920s. As the 1930s approached, the foreign policies that the two governments developed began to give the first signs of an inevitable confrontation:

"The ruling elite in Tokyo, despite Japan's spectacular economic advances of the interwar period, came to regard hegemony over China and the French, British, and Dutch empires in East Asia as the only alternative to economic decline and subservience to the European powers that controlled the vital resources of the region. Conversely, a consensus gradually developed

in Washington that the addition of China and the European possessions in Asia to the Japanese empire would constitute an unacceptable alteration of the balance of forces in the Western Pacific as well as a severe menace to American economic interests in the region. Once these mutually incompatible perceptions of national interest became the basis of foreign policy, it was only a matter of time before the two powers on opposite sides of the Pacific would come to blows" (49).

b) Japan's Postwar Metamorphosis

By the year 1945, Japan was prostrate, with its economic and military power demolished, and its national symbol, the emperor, nullified (see Table 3.1).

However, as A.F.K. Organski and Jacek Kugler point out, losers in modern wars, suffering from severe and devastating damages, often exert such a strong decisiveness with an astonishing speed and vigor and sometimes they grow so rapidly that they even catch up with their wartime conquerors (50).

After World War II, the Japanese abandoned their ambition to have a strong military force, but their desire to catch up with the West in economic wealth and modern industries remained strong.

Table 3.1: Damage to the National Wealth

(J. Yen 100 millions)

	Total Damages	Estimated Total Value in the Absence of Damages	Remaining National Wealth at the End of the War	Proportion Damages (%)	National Wealth in 1935 Converted into Current Values at the End of the War
Total National Wealth Assets	643	2,531	1,889	25	1,867
Industrial Machinery Tools	222	904	682	25	763
Ships	74	91	18	82	31
Electricity and Gas Supplying Facilities	16	149	133	11	90
Furniture and Household Effects	96	464	269	21	393
Products	79	330	251	24	235

Source: Economic Stabilization Board, Comprehensive Report on Damage to Japan from the Pacific War. (1949).

The best evidence of the change in Japanese attitude is reflections on the government's economic plans (see Table 3.2). To quote R. Komiya and M. Itoh:

"Slogans like 'modernization of firms' equipment', 'rationalization of industries', and 'promotion of heavy and chemical industries' were very popular in the 1950s. In the New Long-run Economic Plan (Shin Keizai Keikaku, 1958-62), and the Plan for Doubling National

Income (Kokumin Shotoku Baizo Keikaku, 1961-70), which followed the Five Year Plan for Economic Independence, 'strengthening the foundation of industry', 'sophistication of the industrial structure', and 'heavy and chemical industrialization', were the top priority policy objectives" (51).

Table 3.2: Changes in Government Economic Plans, Post-War Period (1955-1965)

Name of Plan	Five Year Economic Self-Support Plan	New Long-Range Economic Plan	National Income Doubling Plan	Medium-Term Economic Plan
Date Drawn up	December 1955	December 1957	December 1960	January 1965
Cabinet	Hatoyama	Kishi	Ikeda	Sato
Planning Period	FY 1955-60 (five years)	FY 1958-62 (five years)	FY 1961-70 (ten years)	FY 1964-68 (five years)
Real GNP (Planned)	5.0%	6.5%	7.2%	8.1%
Growth Rate (Achieved)	9.1%	10.1%	10.9%	10.8%
Rate of Expansion in Mining and Mgf. (Planned)	7.4%	8.2%	10.5%	9.9%
Rate of Expansion in Mining and Mgf. (Achieved)	15.6%	13.5%	13.8%	13.6%

Source: Takafusa Nakamura, The Postwar Japanese Economy: Its Development and Structure, (Tokyo: University of Tokyo Press, 1990).

The years following World War II brought many favorable conditions that enabled Japan to achieve these policy objectives. The

upward trend of the world economy; latecomer effects in industrialization; and the United States hegemonic umbrella in both military and economic areas were the most important factors among them (52).

According to UN statistics, the global gross domestic product (GDP) from 1950 to the mid-1960s grew at a rate about 5 percent (53). This rate, according to A. Maddison's estimates, as T. Nakamura and J. Kaminski quoted, was 2.7 percent from 1870 to 1913, and 1.3 percent from 1913 to 1950 (54). It is very apparent that, comparatively, the post- World War II growth rate was far higher than that of the prewar years. Moreover, again according to Nakamura and Kaminski:

"...the volume of world trade tripled between 1955 and 1970, with a growth rate of 7.6 percent, while it grew at 3.5 percent from 1870 to 1913 and at only 1.3 percent from 1913 to 1950" (55).

It was fortunate for Japan that it underwent its recovery and expanded its economy during a period of world prosperity, which would otherwise have taken more time and a hazardous path.

Another international development that the Japanese utilized very much, was the establishment of the United States hegemony in the postwar era. First of all, US global strategies provided Japan with an invaluable opportunity to dispense with most of its military

expenditures. As T. Inoguchi pointed out:

"The ratio of military expenditures to overall government spending has been about 5 percent and its ratio to GNP has been less than 1 percent for the post-World War years. This is a minuscule amount compared with that spent by the other major OECD powers - approximately 10 to 30 percent of total government spending" (56).

This pattern of behaviour did not cease with the end of the immediate post-war years, but continued in the 1970s and 1980s, too (57). (See Table 3.3) .

Table 3.3: Defence Expenditure Patterns of Selected OECD Countries, 1978-1986

Year	Japan	U.S.	U.K.	FRG	France
1978	5.5%	23.5%	14.4%	19.4%	17.5%
1979	5.4	23.5	14.8	19.0	17.3
1980	5.2	23.6	14.7	19.0	17.4
1981	5.3	24.2	14.6	19.0	17.5
1982	5.5	26.2	15.8	18.8	18.3
1983	5.5	26.6	13.1	19.6	17.1
1984	5.8	26.8	13.5	19.7	18.2
1985	6.0	27.2	11.6	19.8	18.2
1986	6.2	27.6	-	19.9	-

Source: Comparative Economic and Financial Statistics. Japan and Other Major Countries . (1986, 1987).

Secondly, the US hegemonic umbrella furnished Japan with easy access to the world market, both for exports of manufactured goods and imports of natural resources and its integration into it.

Without this unprecedented liberal economic order, Japan would have been faced with great difficulty in developing its present day trading patterns with the rest of the world (58). The timing of Japanese industrialization has been the other major determinant of modern Japanese economic development. Following the path that had been drawn by the established industrial countries, they were able to see where they were going.

As K. Pyle quoted, Donald Dore, in his comparative study of British and Japanese industrialization observes that since "Japan, like all follower countries, knew better where it is going", its industrial growth was more continuous and steady. Furthermore, being a latecomer, Japan had the opportunity not only to see where it was going but also to reach its destination faster, because of lower costs and technological improvements by learning from the forerunners (59). As Pyle quoted again, Trotsky defined this as "the law of combined development" which he describes as a "privilege of historic backwardness" (60).

Japan, taking the advantages of all of these favorable conditions, slowly leaked into and then penetrated the world markets. Today, Japan is a country which flies low in the community of nations regarding military and political issues. On the other hand, as a result of its single-mindedly pursued policies for economic growth and prosperity, it has a world-wide status as a first rank economic power. The implications of this immense economic growth on the environment will be dwelt upon in the following sections:

3.2 The Environment and the Japanese

As we noted in the preceding section, for Japanese the highest political priorities have been the economic reorganization and rapid growth during the decades following the World War II. Meanwhile, the other concerns, including the environmental protection, were either explicitly ignored or suppressed since they were seen as detrimental to their efforts in bringing about "the economic miracle". These were the years that the general bias in the world shared by the other countries, including the earlier industrialized ones, was for profit over environmental amenities (61). But, as T.J. Pempel points out, "in Japan, the preference seemed overly strong for economics" (62). Consequently, growth in Japan during the 1960s and 1970s, as Table 3.4 indicates, was the most extensive in the industrial world compared with that of any other OECD countries (63).

Table 3.4: Growth Rates, Japan and Selected OECD Countries, 1960-70 (% per year)

Country	GNP	Industrial Production	Energy Consumption	Stock of Automobiles in Use
Japan	10.8	14.8	11.6	25.3
U.S.A	4.2	4.8	4.5	3.7
U.K	2.7	2.8	2.3	6.6
France	5.6	5.9	5.3	8.2
Italy	5.5	7.0	8.9	24.1
Sweden	4.6	6.1	5.0	6.4
Netherlands	5.3	7.3	8.4	15.7
OECD	5.0	5.9	3.0	6.2

Source: OECD, Environmental Policies in Japan, (Paris:OECD, 1977), p.9.

On the other side of the coin, Japan, by the end of 1960s, had become the most polluted country in the world.

a) Japan's Internal Environmental Policies

The Organization for Economic Co-operation and Development (OECD) Secretariat's report on Japanese environmental policies, which was prepared to submit to the OECD Conference held in 1976, pointed out that five major factors had aggravated the effects of pollution in Japan:

"1) Economic indicators, such as industrial production, energy consumption, and the number of automobiles, are high compared to world levels; (see Table 3.4)

2) Production growth rates have been extremely high in Japan (for example; the production of plastics increased ten times between 1960 and 1970);

3) Economic activities concentrate in relatively small areas, consequently industrial output per square kilometer of inhabitable area in Japan is more than twenty times as much as in the United States and nearly eight times that in the United Kingdom;

4) Public investments in social overhead had been small in Japan; and

5) The economic growth-oriented social attitudes and values in Japan resulted in the neglect of competing

goals, such as environmental protection" (64).

In addition to the usual types of pollution - air, water, noise and waste - caused by these factors that penetrated urban Japan, several specific diseases developed between the late 1950s and the end of the 1960s, three of which were particularly notorious: Minamata disease; Itai-Itai disease; and Yokkaichi asthma (65). (See Appendix B).

However the government was slow in reacting and taking necessary steps -in establishing policies- for the prevention of pollution. The attitude of the established political opposition was no different than that of the government. Thus, no strong voice was raised against the problems of pollution until the late 1960s. Environmentalists and pollution victims, facing a wall of indifference, organized themselves into citizens' movements (*jumin undo*) that sought to operate outside conventional party, bureaucratic, and legislative channels. Most members of these movements were otherwise apolitical individuals - their main concern was not the improvement of the environment in general, but the immediate cessation of the industrially caused pollution problems, thus their consequences. In most instances, the targets of their geographically based protests were local governments and the courts. In their cause, media provided them with a considerable help. "It was in this context that", to quote T.J. Pempel, "...Japanese politics saw the germination of what came to be called the antipollution or environmental movement, a combination centered around citizen's groups, local governments, the court system and the media" (66).

Ultimately, worries about environmental destruction reached a peak, and the combined actions of these forces made it impossible for the national government to ignore the problems any longer. But when the government first began to act, at the end of the 1960s, it was with little unity of purpose among the ministries. The only coherence achieved in coping with pollution was that the issue should have been handled without disrupting high economic development and industrial freedom (67). Not until the so-called pollution Diet of 1970 is it possible to speak meaningfully of a governmental agenda aimed at vigorously attacking the environmental problems of the country (68).

As T.J. Pempel and H. W. Maull point out what was striking that once the issue was seriously taken up, it was handled with a force, clarity and effectiveness. It belied earlier expectations that, as the ally of big business, the government would resist all efforts for a meaningful commitment to environmental protection. On the contrary, when the government finally acted, it did so with such vigor that Japan's domestic environmental policies made quantum leap from complete ignorance, or, at best, symbolic steps, to a comprehensive set of environmental laws and practices, which in some areas, today, represent world-wide standards of excellence (69).

b) Japan's Global Environmental Policies:

The Traditional Attitude

Japan's reputation, when it comes to global environmental issues, is, with one word, abysmal: It is widely seen as one of the

worst offenders against the protection of global environment (70). Japan's contribution to global environmental degradation basically comprises 2 dimensions: the impact of the Japanese economy itself on global environment (direct impact); and the ecological shadow of its global economic activities (indirect impact).

1. Japan's Direct Impact on Global Environment:

Japan's direct impact on global environment shall be examined under three headings; global warming, acid rain and depletion of the ozone layer; not only because these are the most significant global environmental problems, but also because they are for the most part produced by the functioning of the world's largest economies, like Japan.

i. Global warming:

Heat from the sun is absorbed by the earth's atmosphere and its surface, so that some of this heat is emitted back into outer space in the form of infrared rays. This absorption and emission of the sun's heat is a balanced process, enabling the maintenance of an overall constant temperature on the earth. Atmospheric gases such as carbon dioxide, however, absorb the infrared rays being emitted into outer space. When the presence of such gases increases - mainly as a result of industrial and automotive emissions - not enough heat can escape and the overall temperature of the earth rises, a phenomenon known as the greenhouse effect. An Intergovernmental Panel for Climate

Change (IPCC) report warns that such warming can endanger agriculture, forestry, and ecosystems, as well as raise the sea levels (71).

Japan's marked energy efficiency; which is the product of the policies pursued following the two oil crises in the 1970s and mainly based on the Law Concerning the Rational Use of Energy; and its strict emission regulations help Japan to limit its contribution to the problems of global warming quite effectively (72). As Figure 1 in Appendix G shows, Japan's stance in a comparison of per capita carbon dioxide emissions is quite well.

However, given the size of its economy, as it can be seen in Figure 2 in Appendix G, it ranks fourth among the major carbon dioxide polluters after the US, ex-USSR, and China (73). To quote H. W. Maull:

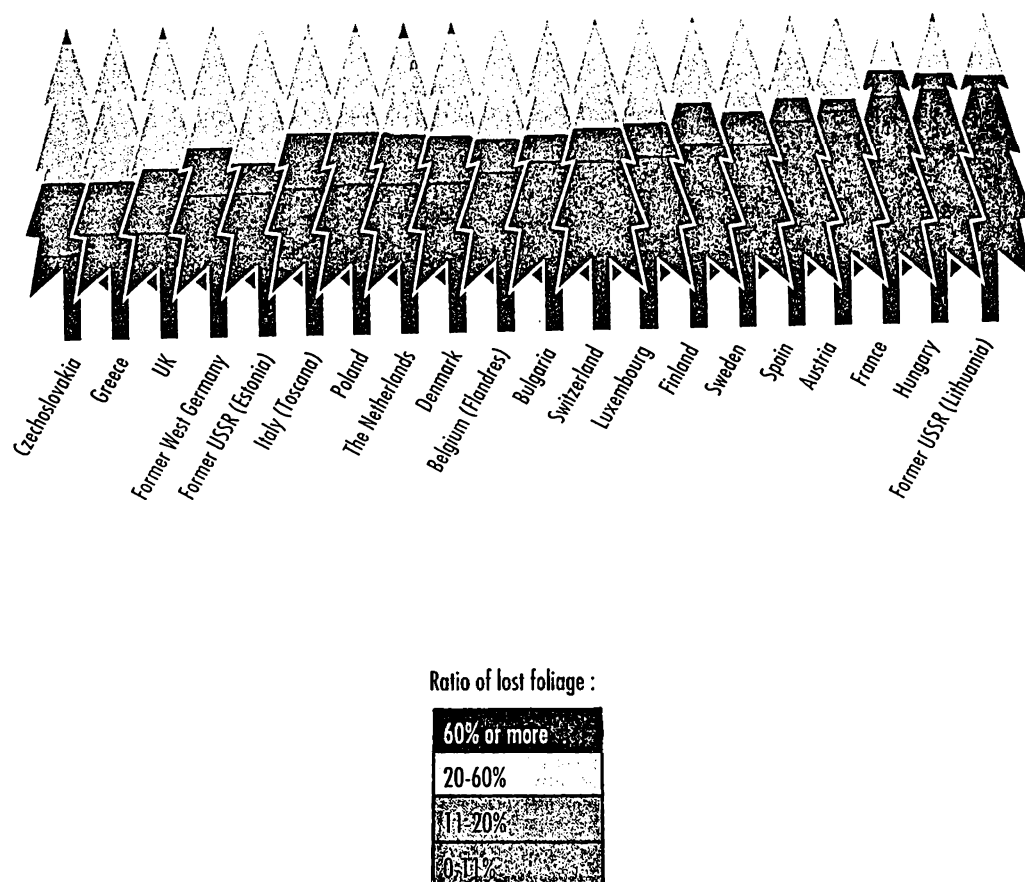
"Overall, in relation to the size of its economy, Japan can point to a very impressive record of lowering its emissions of carbon dioxide over the last two decades. While this was largely the by-product of efforts at enhancing energy efficiency through industrial modernization restructuring, the positive contribution to global environment has been real" (74).

ii. Acid rain:

Acid rain is caused by excessive atmospheric levels of sulphur oxides (SOX) and nitrogen oxides (NOX) produced by burning fossil fuels. As air currents can carry acid rain several thousand kilometers from the source of pollution before depositing it, acid rain crosses

borders to become a serious problem affecting many nation (75). According to a United Nations Economic Commission for Europe survey conducted in 1987, more than 30% of Europe's forests have been damaged by acid rain and air pollution (76). (See Figure 3.2).

Figure 3.2: Damage to European Forests from Acid Rain and Air Pollution (1988)



Source: Ministry of Foreign Affairs, Japan's Environmental Endeavours, (1992): 5.

Japanese environmental standards for SOX and NOX emissions, as well as other particles associated with acid rain, are the strictest in the world (77). (See Table 1 and Table 2 in Appendix G).

iii. Depletion of the ozone layer:

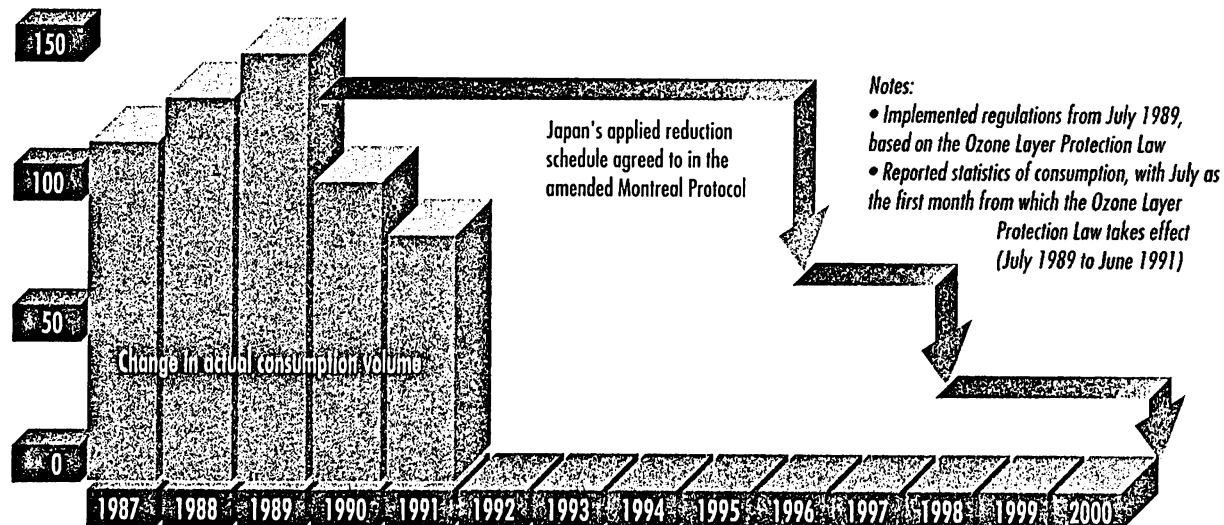
The ozone layer absorbs harmful ultraviolet rays, preventing them from reaching our planet and causing chemical changes to DNA, the source of life. Should this ozone layer be destroyed, an increase in the incidence of such physical ailments as cataracts and skin cancer would occur, as well as widespread damage to our ecosystems. The chief causes of ozone depletion are chlorofluorocarbons (CFCs) and halons used by industry as refrigerants in air conditioners, propellants in aerosol sprays, and as cleansers for electronic parts (78).

The 1985 Vienna Convention for the Protection of the Ozone Layer, and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer are two important international measures for protecting the ozone layer. Included in these measures is a pledge to reduce CFC usage by 50% within 10 years. At the second meeting of the Montreal Protocol held in June 1990 in London, participants further agreed to the total phase-out of controlled CFCs by the year 2000 and to establish a fund to assist developing countries (79).

In Japan, some protective measures have already been implemented toward the total phase-out of controlled CFCs and halons

by the year 2000. Based on the Law of Concerning the Protection of the Ozone Layer through the Control of Specified Substances and other measures established in 1988 and amended in 1991, both the production and consumption of such CFCs have been steadily reduced based on the schedule of the Montreal Protocol (80). (See Figure 3.3). Presently, many industrial companies are aggressively attempting to reduce CFC use through the development of devices that limit CFC emissions, the recycling of collected CFCs, and the development of suitable alternatives. (81). (See Table 3 in Appendix G).

Figure 3.3: Changes in Consumption of Controlled CFCs and Schedule to Reduce Consumption in Japan (unit: thousand ODP tons)



Source: Ministry of Foreign Affairs, Japan's Environmental Endeavours, (1992): 7.

Taken separately, Japan's direct contribution to global environmental degradation seems relatively small. However, as Japan's large and rapidly growing share of world economic activity is taken into account, it becomes substantial.

2. Japan's Indirect Impact on Global Environment: **(Japan's Ecological Shadow)**

What refers to the other dimension of Japan's contribution to global environmental degradation has been called the "ecological shadow" of Japan's economic activities. To quote H.W. Maull:

"Japan exports pollution - directly through such activities as dumping waste, but more importantly indirectly through its global trading and direct investment activities" (82).

Mac Neill defines the "ecological shadow" of a country as follows:

"Today...the major urban/industrial centers of the world are locked into complex international networks for trade in goods and services of all kinds...these nations...draw upon the ecological capital of all other nations to provide food for their populations, energy and materials for their economies, and even land, air, and water to assimilate their waste by-products. This

ecological capital which may be found thousand of miles from the regions in which it is used, forms the "shadow ecology" of any economy. The oceans, the atmosphere (climate), and other "commons" also form part of this "shadow ecology". In essence, the ecological shadow of a country is the environmental resources it draws from other countries and the global commons..." (83).

Measuring Japan's "shadow ecology" is obviously very difficult, if not impossible. But at the same time, it is not so hard to guess its importance in reference to Japan's share of world imports of primary commodities and its explosively growing foreign direct investments. At this juncture, it may be useful to pause in order to take a closer look at Japan's imports of world resources and overseas activities.

i. Japan's import of world resources:

Japan's amount of imports of food, raw materials and mineral fuels, which occupies major part of resource imports, accounted for 58% of its total amount of imports in 1986. These imports mainly include agricultural products, wood and textile materials, metallic materials and petroleum. In the first place, food imports are increasing year by year. Food imports accounted for 15.2% of the total imports in value in 1986. Table 3.5 shows the proportion of Japan's import of corn, wheat, barley and soybeans to the world's total import of these items. In terms of planted area, Japan's import volume of these four

items is estimated to be equivalent to 934,000 ha. or 3.8 times as large as the total area of Japan's arable area (84).

Table 3.5: Japan's Import Quantities of Major Cereals and Other Crops (1986)

	Japan	World Total	Percent of Total	Ranking	Estimated Area
	(millions of tons)		(%)		(thousands of ha)
Corn	14.2	68.6	21	2	3.859
Wheat	5.5	93.8	6	3	2.485
Barley	1.7	20.1	8	3	746
Soybeans	4.9	25.4	19	1	2251
Total	26.3	207.9	13	2	9.341

Source: FAO, Production Yearbook, (1985).

As Table 3.6 shows, Japan is the world's largest importer of some of the raw materials such as cotton, wool, roundwood, and crude oil. Japan's import of cotton accounted for 15% of the world's total import in 1986. The major exporters of cotton to Japan include the United States (component ratio in volume : 28.4%), China (16.1%), Pakistan (13.5%), and Australia (13.4%) (85).

Table 3.6: Japan's Import Quantities of Major Raw Materials and Fuels (1985)

	Japan	World Total	%	Ranking
Cotton (1.000 tons)	681	4.545	15	1
Wool (1.000 Tons)	138	911	15	1
Roundwood (1.000.000 m2)	46	196	24	1
Crude Oil (1.000.000 tons)	165	1.131	15	1
Coal (1.000.000 tons)	93	340	27	1
Natural Gas (1.000 trillion J. Yen)	1.467	8.400	17	1

Source: FAO, Trade Yearbook, (1986); FAO, Yearbook of Forest Products, (1986); U.N., Energy Statistics Yearbook, (1986).

As regards the import of wild fauna and flora, Japan imports them as decorations, raw materials for drugs or pets, etc. Japan is a leading importer of wild fauna and flora (86).

Perhaps the most graphic example of Japan's shadow ecology has been the Japanese role in destroying tropical forests in South-Asia. Today, tropical rain forest disappear at a rate estimated at 20 million hectares per year - an area roughly the size of the United Kingdom (87). Japan is the major importer of tropical timber (88). (See Table 3.7). Most of Japan's imports of tropical wood are used to make concrete forms and materials. These are the uses for which, by and

large, substitutes could easily be found (89).

Table 3.7: World Trade in Tropical Timber, 1987

Major Exporters	%	Major Importers	%
Malaysia	48.6	Japan	28.1
Indonesia	26.7	China	9.2
Singapore	5.2	Hong Kong	4.2
Philippines	3.2	USA	7.5
Cote d'Ivoire	2.4	Singapore	6.2
Brazil	2.4	South Korea	6.2
Gabon	2.0	United Kingdom	4.7
Memorandum Items			
Asia	87.6	Asia	54.3
Africa	8.0	EC	20.1
Latin America	4.4		

Source: The World Bank, International Trade and the Environment (1992).

It can be derived from the data presented in this section that Japan, far from being a self-sufficient country, is critically dependent on the rest of the world nearly for the entire range of raw materials and foodstuffs to provide the persistence of its economy. What makes Japan a leading importer of resources in the world is the crutiality of this dependency. In this context, Japan is closely related to global environment, because its imports of resources cover a very wide range of not only renewable, but also non-renewable resources in huge and continuously increasing amounts.

ii. Japan's overseas activities:

The relationship between Japan's overseas activities and global environment can be examined under two headings: Japan's Overseas Direct Investments and Official Development Assistance (ODA).

Japan's overseas direct investments have been rapidly expanding since the beginning of the 1980s. In fiscal 1986, Japan's overseas direct investment increased to a total of USDLS 22.32 billion. The accumulated amount of Japan's overseas direct investment (after 1951) reached USDLS 105.97 billion at the end of fiscal 1986, with the result that Japan became a leading overseas direct investor of the world. By industry as of the end of fiscal 1986, commerce and services accounted for 60.4% of the overseas direct investment, the manufacturing industry 26.6% and resources development 13.0%. By region on the other hand, North America topped the list in commerce and services, while Asia topped the list in the manufacturing industry and resource development (90).

ODA is defined by the OECD Development Assistance Committee (DAC) as grants or loans with very low interest rates, given to developing countries. And it is another way of Japan's involvement into overseas activities. Table 3.8 shows the amount of Japan's ODA in respect to those of other DAC countries. In the geographical distribution of Japan's ODA, Asia accounted for 51 %, Middle East 20.4 % Africa 10.3 %, Central and South America 9.5 % Oceania 1.3 %, Europe 0.2 % and unallocable 2.5 % as of 1991 (91).

Table 3.8: ODA Amounts and Shares of the DAC Countries**(million \$; %)**

	1990			1991		
	Rank	Amount	Share	Rank	Amount	Share
Japan	2	9,069	16.3	1	10,952	18.8
USA	1	10,194	18.4	2	9,642	16.5
Germany	4	6,320	11.6	3	6,769	11.6
France	3	6,579	12.5	4	6,663	12.0
UK	6	2,638	4.8	5	3,248	5.6

Source: Economic Cooperation Bureau, Outlook of Japan's Economic Cooperation (1992), 14.

It is apparent that as the internationalization of the Japanese economy continues, which it now seems firmly set upon, the range of Japan's shadow ecology will also expand. And, its size will be determined by the number of people it covers, their consumption or level of economic activity, and the efficiency with which this activity uses material resources and energy.

CHAPTER 4

FROM ECO-PREDATOR TO ECO-PROTECTOR ? JAPAN'S CONTRIBUTION TOWARD THE CONSERVATION OF GLOBAL ENVIRONMENT

By virtue of its geographic position, Japan has long lived sheltered from cross-border environmental problems. Thus the division between national and international environmental policies has until recently been considerably more clear-cut in Japan than in any other industrialized country. Consequently, Japanese international environmental policies have long been comparatively weak and parochial. However, recently there appear some signs of change in Japan's attitude regarding the international environmental issues, which implies that this division is likely to be narrowing.

The Japanese experience of economic development and its domestic environmental policy achievements show that Japan has a great ability to pursue its policy directions effectively and actualize them within a very short time period once the necessary will coalesces. Thus claiming the existence of some signs of change in Japan's attitude regarding global environmental issues implies that the will and actions of the Japanese government, the enterprises, and the Japanese society - the entities without whose will and actions, no social movement can be achieved in Japan - must be coalesced to contribute to global environment.

This chapter is designed to explain the changes claimed to occur in Japan's attitude, at the same time, it is an effort to answer the question whether the will and actions of the said entities are really coalesced or not.

4.1 The Environment and the Japanese Government : The Changing Attitude

In regard to measures to cope with environmental problems which have grave impacts on the global environment, the government decided on May 12, 1989, to establish a Ministerial Council on Global Environment Conservation (92). The nation's basic recognition of global environmental issues and its basic policy regarding them are clarified in the first meeting of this Council with an agreement "On Measures for Global Environment Conservation", which was held on June 20, 1989. In this agreement, it was agreed that:

"Japan, which is closely related to global environment through its extensive economic activities, and has advanced technologies in the environmental pollution control and other sectors - when global environment issues have come to the fore and there are mounting calls for measures to cope with them - should play a more positive role commensurate with its international position" (93).

The Council presented the following six items as the basic principles Japan should follow for the time being:

"1. To positively participate in formulating an international framework for protecting global environment and promote measures from a global viewpoint.

2. To promote the observation/ monitoring and researches of global environment in order to expedite the formulation of the basis for global environmental protection through scientifically understanding the effects of various human activities on global environment.

3. To pursue the development and transfer of technology for global environmental protection, thus contributing to the various international efforts.

4. To make efforts for an expansion of official development assistance (ODA) for environment protection, the development and transfer of appropriate technology for developing countries and the training of human resources in the environmental sector, etc.

5. To strengthen environmental consideration as for the implementation of ODA..

6. To ensure that the economic activities are carried out in a manner which has less burden on global environment, such as the promotion of resource conservation and saving energy and to promote awareness and education in each segment of the people" (94).

The government, in order to coordinate the works of all ministries and agencies concerned and to promote a smooth implementation of measures to cope with global environmental problems, decided, in the same year, to assign a Minister in Charge of Global Environmental Problems, a position held by the Director General of the Environment Agency; the agency which bears primary responsibility for the environmental policies of the country (95). (See Appendix C).

The starting point of the second meeting of the Council was the belief that "in solving the problems associated with global environment, it is necessary to accumulate scientific findings in a long-term perspective, and it is necessary that Japan should take the lead in the world in striving for the accumulation of scientific findings with close cooperation with researchers both in Japan and abroad" (96). From this point of view, the Ministerial Council met for the second time on October 31 and came to an agreement "On the Comprehensive Promotion of Research, Observation/Monitoring and Technology Development for the Conservation of Global Environment" (97). In June 1990, the third meeting was held to approve the Program for the Comprehensive Promotion of Basic Research and Study, for Global Environmental Conservation in Fiscal 1990 in accordance with the agreement reached at second meeting (98). It was also decided (1) to formulate an action for arresting global warming in the early part of 1990, (2) and internationally advocate the necessity of coming out with a long term vision (earth renewal program) about measures to cope with global warming (99). In response to this, the fourth meeting was held in October 1990 to determine an action program to arrest global warming in accordance with the agreement made

in June of the same year (100). At the fifth meeting held in June 1991, the program for the Comprehensive Promotion of Survey and Research, for Conservation of Global Environment in Fiscal 1991, and reports were made about the measures related to the action program to arrest global warming in fiscal 1991 (101).

In May, the Japan Committee on Global Environment came into being so that each segment of Japanese society could cooperate to conserve global environment, such as making input to the Earth Summit and proposing substantial measures for a society and economy which is friendly to the earth (102). In August 1990, on the other hand, the Prime Minister approved the Basic Program for the Research and Development of Global Science and Technology (103). Total budget related to global environment conservation for all related ministries and agencies came to 480.3 billion Japanese Yens in fiscal 1991. In fiscal 1992, the proposed total budget was 498.4 billion Japanese Yens, up 3.7 % from fiscal 1991 (see Table 4 in Appendix G) (104).

As reported in the January 1993 issue of Nature, the total budget for fiscal year 1993, which starts on 1 April, was set at just over 72,000 billion Japanese Yens (580 billion \$), an increase of only 0.2 % from 1992 and the smallest increase in six years. Despite "a clampdown on government spending because of the recession", again as reported in the same issue, "spendings on research projects linked with global environment have won substantial new funds from the Japanese government's 1993 research budget" (105).

Ministry of International Trade and Industry's (MITI) success in getting a boost in 1993 to its new Sunshine Project aimed at developing environment friendly technology (whose amount was 29.9 billion Japanese Yens out of MITI's total research and development budget which accounted for 258.1 billion Japanese Yens in 1992), is a good example of the Japanese government's tendency to rise the research budget regarding global environmental issues (see Table 4.1) (106).

Table 4.1: What Japan Planned to Spend on Science in 1993

	(in billion Yens)	
	Amount	
	1992	1993
MITI		
Overall R & D	258.1	281.9
Industrial Technology	7.9	25.3
New Sunshine Project	29.9	53.9
Human Frontier Program	3.7	3.9

Source: Nature (January 1993), Vol.361: 3.
Nature (January 1992), Vol. 349: 94.

Increasing its spendings on research projects linked with global environment is only one side of the Japanese government's deep involvement into global environmental issues. The other sides of this involvement are introduced below:

a) Cooperation with Foreign Governments

Since we already examined Japan's contributions to global warming, ozone depletion and acid rain in Chapter 3 in detail, in order to avoid repetition in this section we will not concentrate on them more than what the overall purpose of this section requires and we will extend the dimensions of the Japanese environmental policies further examining protection of tropical forests, protection of wildlife and prevention of desertification.

1. Global warming:

Japan is playing a leading role in combatting global warming through international cooperation by sharing its advanced technology and experience in environmental protection. With this goal in mind in 1990, Japan announced an action program to arrest global warming. Setting the year 2000 and beyond as the target, this program calls for stabilizing the amount of carbon dioxide emissions at the 1990 level on a per capita basis through developing innovative technologies at a faster pace and on a greater scale than currently envisaged. Japan also is pursuing research and development at a new World Data Center for greenhouse gases (107).

In the meeting of the intergovernmental negotiating committee on framework of the Convention of Climate Change, which was held on March 1992, with a view to curbing the emissions of greenhouse gases, Japan proposed that: "1. All nations curb emissions of all greenhouse gases and 2. Developing countries, in particular, exert all possible efforts to

stabilize, for example, by 2000 emissions of carbon dioxide or emissions of greenhouse gases not controlled under the Montreal Protocol". As a mean to achieve this target, Japan proposed the preparation of national strategies or programs which would contain substantial measures and the mechanisms. Japan is also making positive contributions to the progress of negotiations such as by serving as a co- chairman of working groups (108).

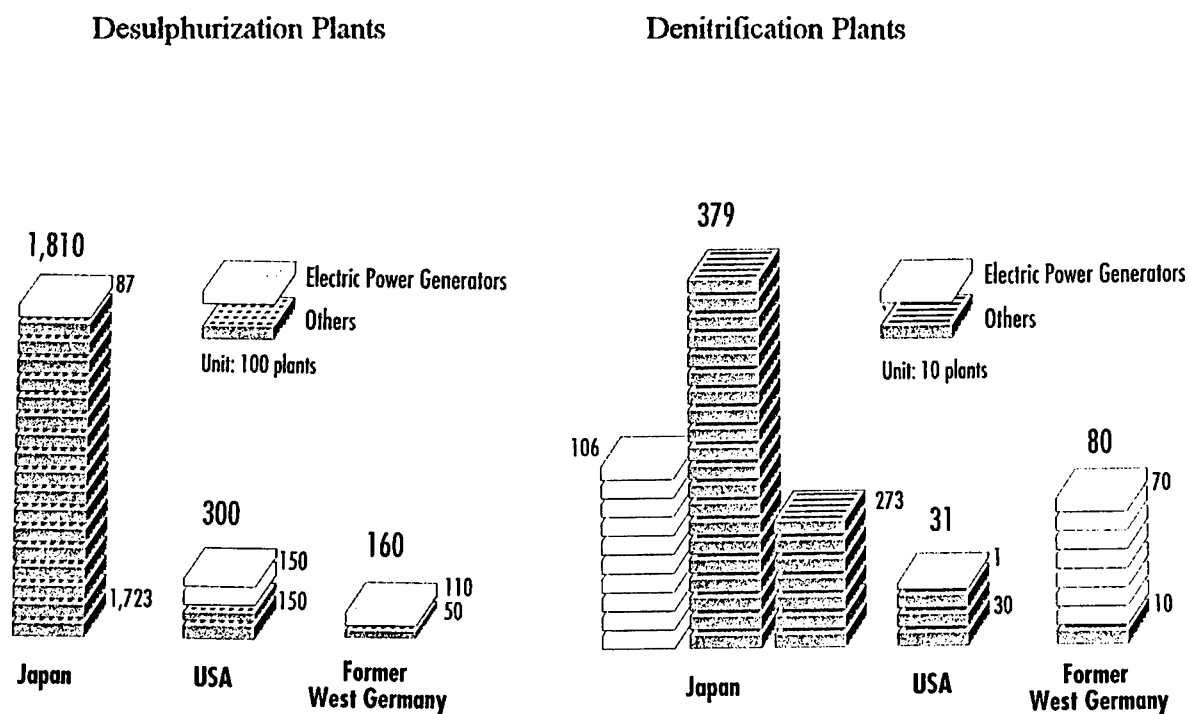
2. Acid rain:

At a conference in Ottawa in March 1984, ten states including Japan pledged to reduce sulphur dioxide emissions by 30 percent and to substantially reduce other pollutants, especially nitrous oxide, thus forming the "Thirty-Percent Club" (109). The Club paved the way for the Protocol on the Reduction of Sulphur Emissions or Their Transboundary Fluxes by At Least 30 Percent (also known as the Helsinki Protocol), which came into force in September 1987 (110). But it lacked the adherence of three major exporters of acid rain: the United States, the United Kingdom, and Poland, which together represent more than 30 percent of total world emissions of sulphur dioxide. Blockading by these states and thus being unable to offer no protection or maybe some little to the victims of transboundary air pollution, the Helsinki Protocol remains the weakest among the other international environmental regimes (111).

Japan, with its 2189 desulphurization and denitrification plants (see Figure 4.1), is the country which has the highest number of such plants in the world - 76 % of the global total (1989), more than 6 times the number of plants in the United States and 7 times that of former West Germany

(112). In this respect, it is the country which is making the greatest contribution to solving the acid rain problem in the world. In addition to taking preventive measures, Japan is also actively involved in the process of giving international assistance on technology that reduces sulphur and nitrogen oxide emissions (113).

Figure 4.1: Number of Desulphurization and Denitrification Plants (1989)



Source: Coal Technical Research Institute, World's Emission Purification Techniques, (1990).

3. Depletion of the ozone layer:

In order to prevent the depletion of the ozone layer, the Vienna Convention for Protection of the Ozone Layer was adopted in March 1985 and the Montreal Protocol on the Substances that Deplete the Ozone Layer in 1987. As a system in which those accords could be appropriately and smoothly observed, the "Law Concerning the Protection of the Ozone Layer Through the Control of Specified Substances and Other Measures" (the Ozone Layer Protection Law) was promulgated in Japan in May 1988. Japan became a party to the Convention and the Protocol in September 1988, transforming from a veto power to a supporting one, a position developed parallel to the increase of the consciousness toward global environmental issues within the country (114).

4. Protection of tropical rainforests:

Japan is taking the initiative in dealing with this global issue. Realizing the need to conserve tropical forests and balancing this conservation with continued economic growth, Japan has been supporting the activities of the International Tropical Timber Organization (ITTO), in which timber producers and consumers have united their efforts in forest conservation. As regards trade in tropical timber, Japan actively promotes and advocates a program called "Environment Friendly Three Principles on Tropical Timber Trade" so as to achieve ITTO's target for the year 2000 of having all tropical timber product exports come from sustainable, managed resources. These principles are:

- "1. Monitoring tropical timber trade
2. Diversifying tropical forest products as well as increasing the value added
3. Developing greater efficiency in the use of tropical timber resources" (115)

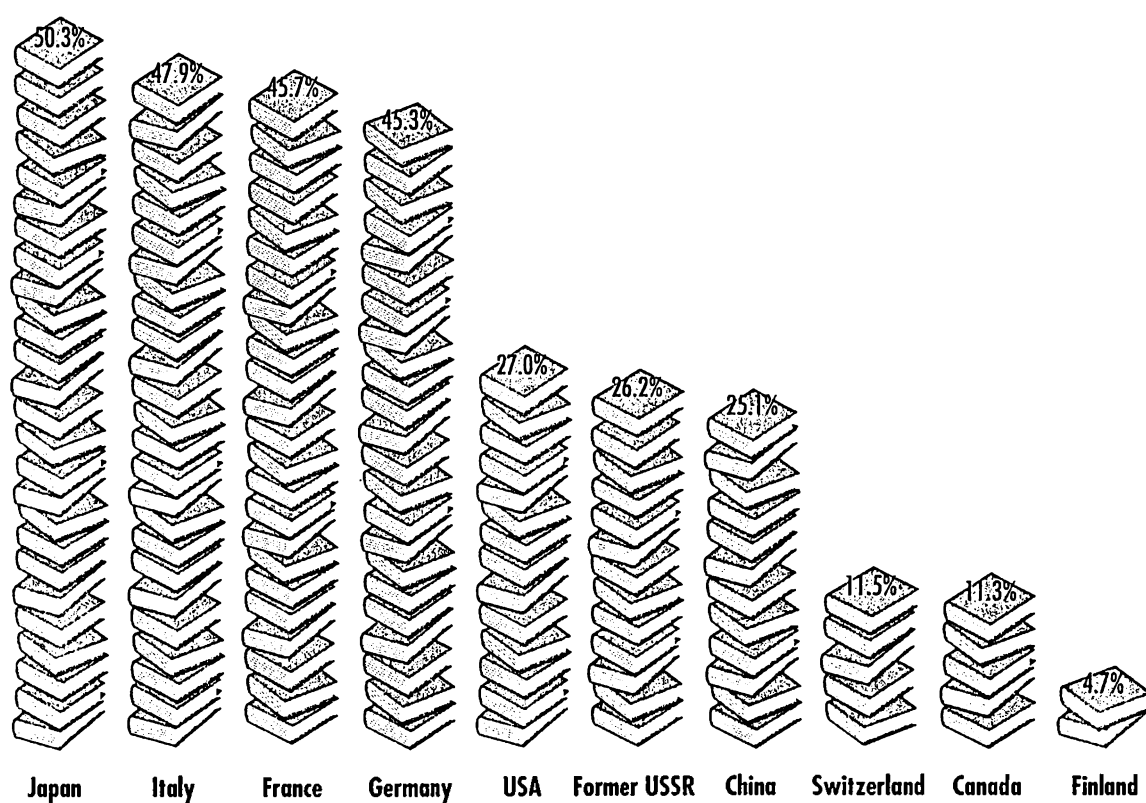
Measures to achieve these goals include:

- "1. Requiring major tropical timber importers to report their imports and prospects regarding future imports to their governments,
2. Technical assistance to tropical timber producing countries to improve timber processing technology,
3. Further development of technology for multiple use of concrete panels" (116).

Through the Japan International Cooperation Agency (JICA), technical cooperation has been rendered on 14 projects in 12 countries in Asia, the Pacific, Africa and Central and South America as of January 1993 (117). Not only the Japanese government, but also the private sector in Japan has also begun to contribute to the conservation of tropical forests in various ways. For example, Mitsubishi Shoji Corporation has started supporting experiments on planting of the saplings of Dipterocarpaceous species for a renewal of the tropical forests in Sarawak, Malaysia. Nissho-Iwai Corporation is making plants for 20,000 hectares of afforestation, centering on local tree species, in Papua New Guinea with a view to

realizing sustainable forestry production. Japan has also been contributing to the conservation of tropical forests by promoting the recycling of paper to better utilise forest resources (118). (See Figure 4.2).

Figure 4.2: Used Paper Utilization Rate (1989)



Note: Utilization rate=Consumption of old paper/paper pasteboard production

Source: Ministry of Foreign Affairs, Japan's Environmental Endeavors, (1992): 13.

5. Protection of wildlife:

Wildlife constitutes one of the basic components which form the ecosystems of the earth and is indispensable as useful resources for mankind. Globally, it is now an urgent task to prevent the extinction of species (see Table 4.2).

Table 4.2: Estimate of the Rate of Species Extinction

	Rate of Extinction (species per year)
Dinosaurian Era	0.001
1600 - 1900 (A..D.)	0.25
1900	1
1975	1,000
Annual Average: 1975 - 2000	40,000

Source: N.Myers, The Sinking Ark (1979).

As a means for international protection of wildlife, Japan commits itself through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); the Ramsar Convention and other multilateral agreements and bilateral convention (119). The Washington Convention - in other words CITES - was drawn up in recognition of the necessity of international cooperation in restricting the excessive buying and selling of wildlife species. Japan ratified the Treaty in 1980 and since then has banned the import of many species and has withdrawn its reservations regarding the import of the giant desert lizard, the musk deer, the salt water crocodile and the green sea turtle (120). Japan also contributes to protecting the many unique species of the world by

tightening of its domestic regulations (121). In June 1989, Japan banned the importation of processed elephant ivory from areas other than Africa; the following September the importation of unprocessed African ivory also was banned for the time being. Just after the seventh meeting of CITES signers in October 1989, Japan stated that it would hold no reservations to the resolution to transfer African Elephant to Appendix I of the Convention, which fundamentally prohibits trading in endangered species (122).

At the 44th meeting of the UN General Assembly held in the Fall of 1989, a Resolution on the Regulation of High Seas Drift-Net Fishing was adopted to establish an appropriate resource management scheme. Japan, by paying full respect to this Resolution and in order to ensure orderly fishing operations, is conducting scientific studies on this matter and promoting cooperative relations with countries concerned, including US and Canada (123).

Japan also provides support to developing countries for the maintenance of natural environments and the adequate management of natural resources. Typical projects have included the dispatch of experts to a Kenyan wildlife public corporation, the planning of a park based on the protection of chimpanzees living in Tanzania National Park, support for a study on the protection of river dolphins in the Yangtze river and cooperation with China in the protection of the Japanese crested ibis and of the panda (124). The major exception to this trend has been the case of whales. Japan's economic interests continues to take precedence over the protection of this species.

6. Prevention of desertification:

According to the definition newly adopted by the UN Environment Program (UNEP) in February 1992, "Desertification is land degradation in arid, semi-arid and dry sub-humid areas resulting mainly from adverse human impact" and "degradation", which "implies reduction of resource potential by one or a combination of processes acting on the land, such as water erosion, sedimentation by those agents, long term reduction in the amount or diversity of natural vegetation and so forth" (125).

The region exhibiting the most extensive desertification is Africa (126). In the follow-up to the Bonn Summit of 1985, Japan mapped out an "African Green Revolution" concept and began rendering assistance in the form of research on African agriculture, the promotion of reforestation, and the setting up of basic facilities for agricultural production. "Green Corps Units", project teams of Japan Overseas Cooperation Volunteers (JOCV) were dispatched to Tanzania and Senegal in 1986 and 1987 respectively as a first step in reforestation efforts. In the private sector such organizations as Association Sahel also are engaging in reforestation work (127). The Japanese are participating in research in China as well on the mechanisms of desertification and in Africa where agricultural development studies are being conducted on the Niger river watershed (128).

b) Cooperation with International Institutions

In addition to its cooperative efforts with foreign governments regarding the global environmental problems, there are signs that Japan is

also trying to extend its field of cooperation to cover international institutions.

In fiscal 1991, Japan made a contribution to the UN Environment Program (UNEP), the world's second largest contribution after that of the United States, and contributed about \$ 9,636,000 to the Yokohama City based International Tropical Timber Organization (ITTO) (129). (See Table 4.3).

Table 4.3: Japan's Contributions to UNEP and ITTO

(\$ thousand)					
Fiscal Year	1987	1988	1989	1990	1991
UNEP	4,500	4,750	5,000	7,203	7,100
ITTO	1,959	2,260	2,596	5,927	9,636

Source: Economic Cooperation Bureau, Ministry of Foreign Affairs, Outlook of Japan's Economic Cooperation (1992).

Japan also stepped up cooperation with multilateral aid institutions in the environmental sector and contributed \$ 3,750 million (including 7,320,000 SDR [\$ 10,000,000] to the core fund of GEF to) the World Bank and the Asian Development Bank for environmental considerations (130). In addition, fund contributions are also made to the UN Food Agricultural Organization (FAO), the Economic and Social Commission for Asia and the Pacific (ESCAP), and other international institutions concerning the promotion of environmental conservation projects (131). (See Table 4.4 and Table 4.5).

Table 4.4: Japan's Contributions to FAO

Fiscal 1983 - 1987	\$ 270,000 annually, used in developing nations for the preservation and the building up their forest resources and on the development and usage surveys of such resources.
Fiscal 1986 - 1988	\$ 400,000 annually, used in a reforestation project in the Hai district of Tanzania
Fiscal 1988 -	\$ 390,000 annually, toward national TFPAs, which assist in the development and preservation of forests

Source: Ministry of Foreign Affairs, How Japan is Dealing with Global Environmental Issues (1990).

Table 4.5: Japan's Contribution to ESCAP

	Year	Amount (\$)
Industrial waste regulations	1981	59,750
Environmental legislation	1983	106,220
	1984	92,956
Environmental concerns relative to development	1986	97,195
	1988	89,152
	1989	39,568
Estimates of fossil fuel consumption in the Asia-Pacific region and other environmental evaluations	1989	230,000

Source: Ministry of Foreign Affairs, How Japan is Dealing with Global Environmental Issues (1990).

c) Cooperation with Developing Countries

With a history of extraordinary environmental problems and triumphant solutions, Japan believes that it has something to offer to other nations, especially to developing ones. These countries are usually inadequately provided with technical and economic foundations and therefore need assistance from developed countries in order to promote effective measures for environmental conservation. Especially in recent years, these countries are increasingly looking forward to the roles Japan could play in the field of technical and economic cooperation for environmental conservation because of its wide experience and record of achievement in this field (132).

1. Technical cooperation:

The major technical cooperation Japan extends today may be divided into the acceptance of trainees, dispatching of experts, project-type technical cooperation and development investigation (133). (See Table 4. 6 and Table 5 in Appendix G).

Table 4.6: Japan's Technical Cooperation

(persons)					
Fiscal Year	1987	1988	1989	1990	1991
Trainees	147	150	314	669	688
Experts	96	129	152	194	162

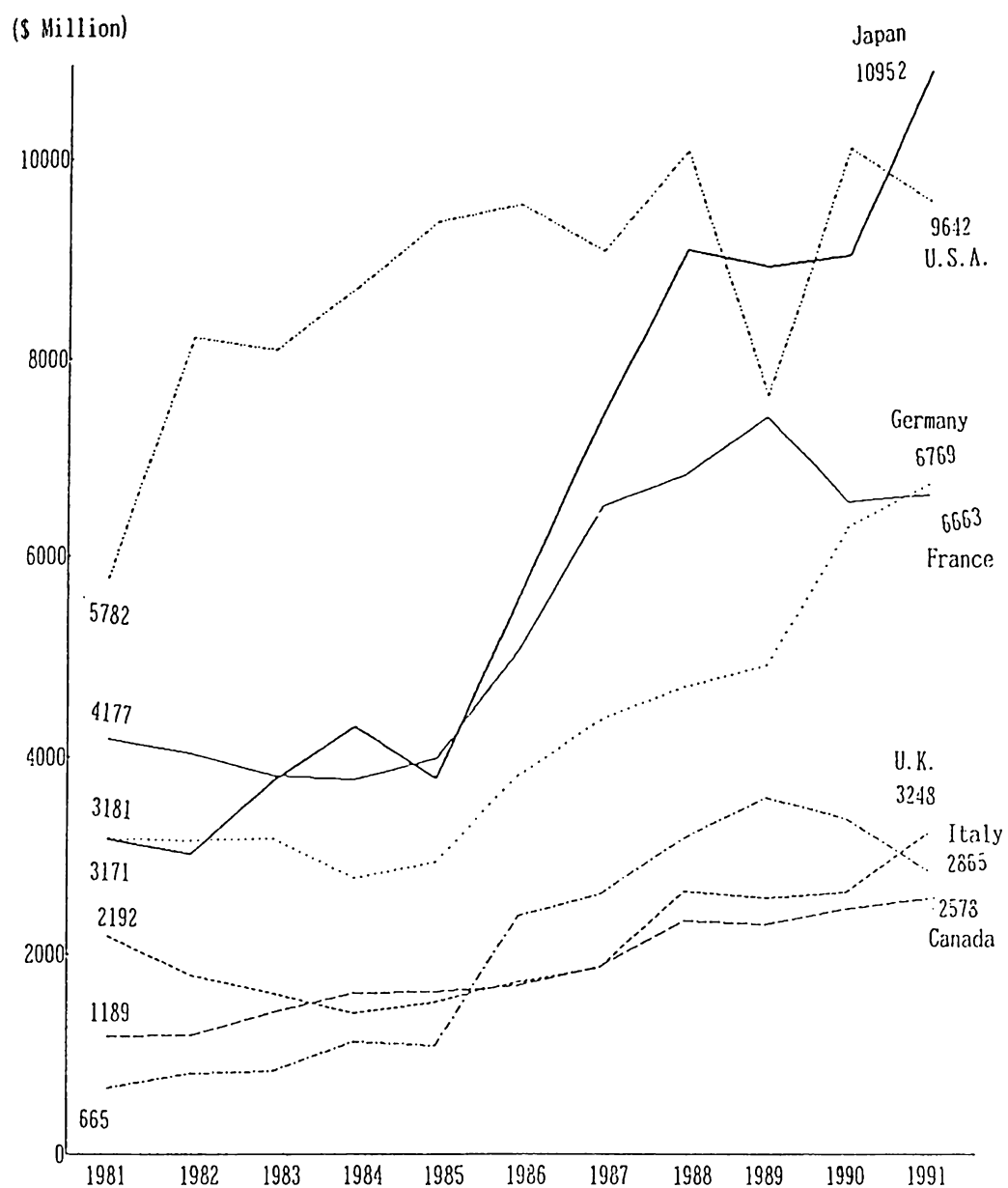
Source: Economic Cooperation Bureau, Ministry of Foreign Affairs, Outlook of Japan's Economic Cooperation (1992).

2. Economic cooperation:

In broad terms, Japan's economic cooperation with developing countries consists of three kinds: Official Development Assistance (ODA), Other Official Flows (OOF) and Private Funds (PF) (134). Reflecting its rising economic strength and international position, Japan's ODA has solidly and rapidly increased in the last ten years (see Figure 4.3) . In 1988, the real amount came to \$ 9,134 million (on a net expenditure basis), placing Japan second in the world after the United States. Japan has also become the world's greatest donor for 29 developing countries which center on those in Asia and Africa (135). Japan's policy announced at the ARCHE Summit in 1989 that it would strive to expand and strengthen bilateral and multilateral aid in the environmental sector with a target set at 300 billion Japanese Yen from 1989 to 1991, was fulfilled by 1990 (see Appendix D) (136).

If we examine Japan's cooperation by official funds other than Official Development Assistance, there appear two recent examples: the Gulf Crisis and Eastern Europe. After Iraq's invasion of Kuwait on August 2, 1990, in particular after Iraq spilled crude oil and fires broke out at oil fields in Kuwait, the Gulf area was directly confronted with grave environmental problems. Japan provided Gulf nations with oil fences as an emergency measure. After the Gulf crisis was over, Japan dispatched an international emergency relief team through JICA for the recovery of spilled oil. Besides, it sent specialists in the sectors of the conservation of seawater desalinization facilities, air pollution, marine pollution and the protection of wildlife.

Figure 4.3: Japan's Official Development Performance



Source: Economic Cooperation Bureau, Outlook of Japan's Economic Cooperation, (Tokyo, 1992) 51.

Also in order to support international institutions on environmental issues, Japan contributed \$ 1,11 million to the UNEP for the preparation of an emergency action program and \$ 1.5 million to the Gulf oil pollution disaster fund of the International Maritime Organization (IMO) and dispatched experts (137). When it comes to grave environmental issues in Eastern Europe, Japan, acting in response to what former Prime Minister Toshiki Kaifu expressed on his visit to Eastern Europe in January 1991, accepted trainees from Eastern European countries. It also cooperated in coping with air pollution in the Miskloc area of Hungary, fuel gas desulphurization at the Kosienice thermal power plant in Poland and by the Melnik thermal power plant in Czechoslovakia. Japan invested \$ 800,000 in the Regional Environmental Center for Central and Eastern Europe established to support measures to cope with environmental issues in the Eastern European region (138).

As we have already seen, global environmental concerns are relatively recent additions to the policy directions of the Japanese government. However, the achievements regarding global environmental issues since these concerns have been taken into its agenda support our view that Japan is likely to narrow the gap between its national and international environmental policies very soon, and even to close it. Japan's decisiveness on this matter is apparent in the speech made by the former Prime Minister Kiichi Miyazawa in the 1992 Earth Summit in Rio de Janeiro, Brasil:

"The prosperity Japan has achieved through the utilization of the resources of the Earth makes it incumbent

upon Japan to play a leading role in the international efforts for both environment and development.

Japanese socio-economic size alone greatly affects the global environment and I consider it one of our international responsibilities to create a Japan which is gentle to the Earth. ... Specifically, we will further promote energy and resource saving and continued work for technological breakthroughs, the benefits of which we hope to share with the rest of the world.

Japan will support the efforts of the other countries, especially developing countries through existing bilateral and multilateral mechanisms" (139).

The Japanese government is not alone in its commitment and efforts to contribute to the global environmental issues. The attitude of the Japanese business world is very cooperative in this respect.

4.2 Attitude of Enterprises

It is necessary for businesses to become fully aware that the global environment problems are now grave for mankind and to accurately grasp what sort of impact their own corporate performance will produce, both directly and indirectly, on the global environment and what sort of influence they must bear from the changing global environment. In Japan, business attitude towards environmental issues is changing rapidly in response to their exposure to environmental concerns abroad. A study by

the Dentsu Institute for Human Studies - a think tank set up by Japan's largest advertising corporation - of the attitudes of 700 chief executives found that in the case of large companies, executives expected environmental concerns to vie for first place with research and development (140). The Keidanren (the Japanese Employers' Federation) has also begun to move on global environmental issues and set up "The Global Environment Charter" in 1991 (for a summary, see Table 4.7; details are given in Appendix E).

The basic philosophy of the Charter is as follows:

"A company's existence is closely bound up with the global environment as well as with the community it is based in. In carrying on its activities, each company must maintain respect for human dignity and strive toward a future society where the global environment is protected" (141).

The Keidanren Charter was publicized to member firms, the government, local governments, labor unions, chambers of commerce, academic associations, consumer groups and others. Overseas, the Charter became the topic of discussion in two UN Committees as an example of voluntary efforts by industry. It was also acclaimed by Maurice Strong, the Secretary General of the UN Conference on Environment and Development at that time. Among other meetings in which the Charter was discussed, are the Japan- US business Conference in July 1991 and the Meeting of the International Union for Conservation of Nature and Natural Resources in Caracas in February 1992 (142).

Table 4.7: Proposals for Concrete Actions Listed in the "Global Environmental Charter"

Types of Measures	Concrete Actions
Internal Corporate Infrastructure	<ul style="list-style-type: none"> - Establish management policy concerning environmental issues - Appoint staff/organizations to deal with environmental issues - Establish environmental goals and monitor progress - Ensure the ability to cope with an environmental emergency - Raise environmental awareness among employees
Consideration of the Environment in Business Activities	<ul style="list-style-type: none"> - Conduct environmental impact assessment - Ease environmental burden at all stages of the business operation - Develop energy/resource saving and environment conservation technology - Conduct scientific research on global warming and other issues - Promote measures that prevent global warming and which contribute towards energy/resource conservation
Interaction with the public	<ul style="list-style-type: none"> - PR activities focused on environmental protection - Provide information on the environment to consumers - Participate in local environmental activities and encourage the voluntary participation of employees in such activities - Strengthen cooperation and understanding between different strata of society
Overseas operations	<ul style="list-style-type: none"> - Give consideration to the environment when extending business operations overseas - Active participation in solving poverty and overpopulation problems in developing countries - Environmental technology transfer
Others	<ul style="list-style-type: none"> - Cooperate with, and give suggestions to the Government's environmental administration

Source: Environmental Agency, Quality of the Environment in Japan (1993).

In January 1992, Keidanren called all member companies to learn how they were reacting to the Charter and to what extent they were incorporating its recommendations. Replies were received from 540 of the 948 member companies - a 57 % response rate. The following are some of the findings:

- ❑ Over 70 % of the responding companies were basing corporate decisions on the Charter internally.
- ❑ Slightly over 50 % of the companies with overseas offices had informed their overseas workers about the Charter.
- ❑ Slightly over 60 % of the companies had appointed a director responsible for environmental issues as well as setting up a department to deal with such issues.
- ❑ Approximately 50 % of the companies had drawn up their own charters based on the Keidanren Charter.
- ❑ Approximately 50 % of the companies had established goals or formulated plans to lessen the burden corporate activities place on the environment.
- ❑ Almost 40 % of the companies had implemented internal inspections relating to environmental management (143).

Considering the fact that international cooperation is vital to the solution of global environmental problems, Keidanren's International Environmental Cooperation Task Force is formulating policies for the transfer of environment related technology to the developing countries (144).

4.3 Attitude of Citizens

As the future of mankind is threatened by the deterioration of the global environment, and the sense of interdependence spreads throughout the world, it becomes the obligation of every individual to adjust his/her life style in accordance with the environment. In this regard, the people of Japan are highly concerned about environmental issues. In a 1989 Yomiuri Shimbun- Gallup poll, 71 % of the Japanese people rated environmental protection as more important than economic development, a higher percentage than in the other four countries that were surveyed: the USA 51 %, the UK 55 %, the former West Germany 61 % and France 52 % (145). In another attitudinal survey of 1,000 Tokyoites conducted by an advertising company, 73 % of respondents cited the environment as the most compelling social issue today. There is deepening awareness that the environment should be given priority over mere convenience. The majority of respondents said they would be willing to return to a standard of living equivalent of that of ten years ago if it would help save the environment. A remarkable 60 % said they would be willing to pay higher prices for products made to protect the environment or conserve resources (146).

CHAPTER 5

CONCLUSION

Ever since the Industrial Revolution, mankind has reduced reliance on natural products which are put out by eco-systems year by year. Particularly, in the efforts to crawl out the devastation brought about by World War II, the industrialized countries have consciously raised production and set up consumption while thinking that the broadening of economic richness will lead to enhancement of welfare. As a result, environmental pollution and nature disruption came to be observed in various places of the world in 1960s. At this stage, environmental pollution and disruption were confined to certain areas. Nonetheless it did not take a long time for the emergence of the worldwide warning signals from the environment. And it has been realized that if the present direction of the human and environment relationship was left intact, mankind's activities would hit the barriers of the environment and there would appear a catastrophic situation where mankind's lifestyles could not be retained as they were.

Although it became a practice within the industrialized countries to develop policies specialized from the point of reducing and protecting nature, their efforts to curb global environmental issues were still lagging behind the deterioration pace of the global commons. Because, for them, economic interests were still taking precedence over global environmental issues. Among them, the Japanese were the champions of applying the traditional philosophy

that viewed the relationship between man and nature as a continuous battle. However, the recent changes that can be observed in Japan's attitudes toward global environmental issues point out a very strong departure from this traditional philosophy (see Appendix F; *The Economist*, December 11-17, 1993). In this context, they appear as a demonstrative example of the recent trend that the traditional attitudes of the industrialized countries toward global environmental issues are undergoing a metamorphosis. Today, in many industrialized countries, environmental issues are at or near the top of the governmental agenda. This trend supports the view that in the short-run, economic development may degrade the environment but, in the long-run, developed, industrialized countries transform into environmental protectors.

However, one should not take this view in the way that if the countries transform into environmental protectors after a certain stage of their development, then, in the short-run, developing countries can degrade the environment freely. Because, all the signals of the earth is giving indicate that many of the global critical thresholds are being approached, perhaps some passed. Thus, neither the world nor the human societies can afford to have such further "environmental grace-periods". The principle of "first pollute, then clean or pay, or better don't care" is not valid any more.

On the other hand, in many of the developing countries, the politics of environment has a long way to go before environmental concerns overtake the supremacy of developmental concerns. First of

all, they have to become fully aware of the fact that following the conventional Western type of economic development today have only been increasing their dependency and disabling them in the race of development. Beyond and more important than that, Japan as the most recent example of this type of development model has shown that its side-effects, not only for the country but global environment as well, are extremely dangerous and hardly reversible, while some have already reached the levels of irreversibility. Japan was able to develop following the same path, because it was lucky. External conditions were incredibly favorable and moreover, the roots of Japan's economic development had already been founded in the pre-war period. Today's developing countries neither face such favorable conditions nor have infrastructures to carry out such kind of development. But, no one can say them that they have to stay poor to protect the environment. To quote Gro Harlem Brundtland's famous sentence: "It is both futile and indeed an insult to the poor to tell them they must live in poverty to protect the environment".

Today's environmental issues are increasingly global in their complexity and are certainly not "someone else's problems" to be dealt with "over there". Contrasting the scale of the world's developmental needs with the evidence the earth's environmental limits will constitute the main paradox of the coming century.

While the economic and ecological interdependence are intermeshing in the threshold of the 21st century, the inequality between developed (North) and developing (South) countries are

making itself more apparent as the world's main environmental and development problem. In the near future, both North and South will feel themselves compelled to rethink many of their basic assumptions, including their assumptions about their relationships. In this regard, their perceptions and approaches to these relationships carry the roots of tomorrow's possible conflicts. Living in such times that are of great promise, great risk and great complexity, only an alternative form of development that is far less damaging to the environment, appears as the most reasonable solution not only to curb the anxiety between North and South based on growing global environmental problems, thus to increase the threshold for possible conflicts, but to satisfy their lasting development needs as well. The responsibility of achieving this alternative form of development is a global one, resting with the developed and the developing nations, if not in equal measure. Perhaps the most important condition of this development is to integrate the environment and the economy in major institutions of decision-making: Government, industry and the home. Japan constitutes a unique example in this regard. More importantly, it is ready to share its experience and technology both with the developed and developing worlds, and ready to spend money for this purpose. One might question acceptability and applicability of such kind of an alternative development both in the developed and the developing worlds, which requires profound changes in the world's economic and power structures as well as a parallel changes in domestic power structures. At this juncture, the only thing that prevents us from being pessimistic is the growing fact that man has never come so close ever before to redefining itself as part of nature.

APPENDICES

APPENDIX A

FROM THE GOLDEN AGE TO THE AGE OF GOLD

From: Publius Ovid, Metamorphoses [Book I] (Harmondsworth: Penguin, 1968) 31-33.

FROM THE GOLDEN AGE TO THE AGE OF GOLD

In the beginning was the Golden Age, when men of their own accord, without threat of punishment, without laws, maintained good faith and did what was right. There were no penalties to be afraid of, no bronze tablets were erected, carrying threats of legal action, no crowd of wrong-doers, anxious for mercy, trembled before the face of their judge: indeed, there were no judges, men lived securly without them. Never yet had any pine tree, cut down from its home on the mountains, been launched on ocean's waves, to visit foreign lands: men knew only their own shores. Their cities were not yet surrounded by sheer moats, they had no straight brass trumpets, no coiling brass horns, no helmets and no swords. The peoples of the world, untroubled by any fears, enjoyed a leisurely and peaceful existance, and had no use for soldiers. The earth itself, without compulsion, untouched by the hoe, unfurrowed by any share, produced all things spontaneously, and men were content with foods that grew without cultivation. They gathered arbute berries and mountain strawberries, wild cherries and blackberries that cling to thorny bramble bushes: or acorns, fallen from Jupiter's spreading oak. It was a season of everlasting spring, when peaceful zephyrs, with their warm breath, caressed the flowers that sprang up without having been planted. In time the earth, though untilled, produced corn too, and fields that never lay fallow whitened with heavy ears of grain. Then there flowed rivers of milk and rivers of nectar and golden honey dripped from the green holm-oak.

When Saturn was consigned to the darkness of Tatarus, and the world passed under the rule of Jove, the age of silver replaced that of gold, inferior to it, but superior to the age of tawny bronze. Jupiter shortened the springtime which had prevailed of old, and instituted, a cycle of four seasons in the year, winter, summer, changeable autumn, and a brief spring. Then, for the first time, the air became parched and arid, and glowed with white heat, then hanging icicles formed under the chilling blasts of the wind. It was in those days that men first sought covered dwelling places: they made their homes in caves and thick shrubberies, or bound branches together with bark. Then corn, the gift of Ceres, first began to be sown in long furrows, and straining bullocks groaned beneath the yoke.

After that came the third age, the age of bronze, when men were of a fiercer character, more ready to turn to cruel warfare, but still free from any taint of wickedness.

Last of all those the age of hard iron: immediately, in this period which took its name from a baser ore, all manner of crime broke out; modesty, truth, and loyalty fled. Treachery and wickedness took their place, deceit and violence and criminal greed. Now sailors spread their canvas to the winds, though they had as yet but little knowledge of these, and tree which had once clothed the high mountains were fashioned into ships, and tossed upon the ocean waves, far from their own element. The land, which had previously been common to all, like the sunlight and the breezes, was now divided up far and wide by boundaries, set by cautious surveyors. Nor was it only corn and their

due nourishment that men demanded of the rich earth: they explored its very bowels, and dug out the wealth which it had hidden away, close to the Stygian shades; and this wealth was a further incitement to wickedness. By this time, iron had been discovered, to the hurt of mankind, and gold, more hurtful still than iron. War made its appearance, using both those metals in its conflict, and shaking clashing weapons in blood stained hands. Men lived on what they could plunder: friend was not safe from friend, not father in law from son in law, and even between brothers affection was rare. Husbands waited eagerly for the death of their wives, and wives for that of their husbands. Ruthless step mothers mixed brews of deadly aconite, and sons pried into their fathers' horoscopes, impatient for them to die. All proper affection lay vanguard and, last of the immortals, the maiden Justice left the blood soaked earth.

APPENDIX B

MINAMATA AND OTHER POLLUTION - RELATED DISEASES

From: Ministry of Foreign Affairs, Economic Development and the Environment,
(Tokyo, 1992) 6-8.

MINAMATA AND OTHER POLLUTION - RELATED DISEASES

Beginning in the second half of the 1950s a number of serious diseases caused by environmental contamination gained wide attention.

1. THE MINAMATA DISEASE

In 1956, the public health center in Minamata, a city in the southern island of Kyushu, received reports on an outbreak of a disease that attacks the central nervous system. The cause was unknown, but it was becoming clear that related to the heavy metals being discharged into the waters off Minamata by the plant of Chisso Corp. (then Shin Nihon Chisso Hiryo), a chemical manufacturer that produces fertilizers and associated products.

A long and highly politicized debate then began among Chisso's representatives, scientists, and public officials over the precise cause of the disease. Eventually, in 1968, the government officially, acknowledged that the cause was organic mercury, which had entered the water via factory's effluent and had built up in fish and shellfish consumed by local residents. The Health and Welfare Ministry thus recognized Minamata disease as a "pollution disease", and it freed the way for state assistance. Meanwhile, Chisso had already taken steps to curb the release of further mercury, which had been contained in the effluent its acetaldehyde facility, but in 1968 it closed its factory down.

In June 1969 some of the victims brought a suit against Chisso, asking for full compensation. When the suit was settled in their favor in March 1973, the judgement brought to a close what the mass media had been calling the "big four pollution trials" (another of those trials also involved mercury poisoning, but from a different source. This suit was lodged by residents of Niigata Prefecture in June 1967, and the case ended in their favor in September 1971. The other two trials are discussed below).

2. YOKKAICHI ASTHMA

In the second half of the 1950s the petrochemical industry began to grow rapidly, eclipsing the performance of the chemical industry. Whereas Japan's energy needs had previously been supplied by coal and hydroelectric power, oil was now emerging as the central energy source, and the production of petrochemicals was expanding. One of the leaders in this shift was the giant industrial center at Yokkaichi, a city in Mie Prefecture not far from Nagoya. In 1959 Yokkaichi's first industrial complex, with plants for oil refining, petrochemical production, and power generation, began to go into operation. The local residents then began complaining of foul odors and irritating fumes, and they also protested that dirty air was soiling their laundry.

Soon there was a marked increase of asthma in the city, which the citizens started to term "Yokkaichi asthma". In September 1967, after studies by Mie University had clarified that the principal culprit was sulphur dioxide released from smoke-stacks some of the victims took

the six responsible companies to court, thus initiating the third of the four famous trials. The case was decided in their favor in July 1972, and the six companies agreed to make substantial compensation payments. The foul air at Yokkaichi directed wide attention to the problem of air pollution, placing this concern firmly on the government's agenda.

3. ITAI - ITAI DISEASE

In the late 1950s a strange disease in the Jinzu River Basin in Toyama Prefecture began to surface. The victims suffered bone deformation and fractures, and their bones became so brittle that even a single sneeze could sometimes cause a fracture. This extremely painful affliction was named the itai-itai (ouch-ouch) disease by local physicians after the complaints of the sufferers.

Research by Noboru Hagino and other doctors clarified the disease's origin: cadmium poisoning. The source of the cadmium was the Kamioka Mining Station, a lead and zinc mine located on a stream that flows into the Jinzu River. The cadmium had entered the patient's bodies when they drank water from this river, whose cadmium content also contaminated local farmland. Eventually, in May 1968, the government acknowledged that cadmium released by the mine, which is operated by Mitsui Mining and Smelting, was implicated in the disease.

Shortly before this admission, in March, a group of victims filed a

damage suit against the mine, thus initiating the last of the big four trials. When the district court ruled in their favor in June 1971, somewhat ahead of the rulings in the other cases, this judgement represented the first victory in Japan's courts for victims of industrial pollution.

APPENDIX C

ORGANIZATION AND FUNCTIONS OF THE ENVIRONMENT AGENCY

From: Environment Agency, Quality of The Environment in Japan 1989, (1989) 313-321.

ORGANIZATION AND FUNCTIONS OF THE ENVIRONMENT AGENCY

1. ADMINISTRATIVE RESPONSIBILITIES

The Environment Agency is responsible for overall promotion of environmental protection with a view to ensuring a healthy and civilized life for the people of Japan. The following matters are under its jurisdiction.

A. GENERAL

These include the planning, drafting and promotion of basic policies relating to protection of the environment; overall coordination of the various branches of the Government responsible for environmental protection; coordination of budgetary policies for pollution control-related expenditures; and centralized management of appropriations for environmental research and development. The Agency's administrative structure is designed to increase its effectiveness as an overall coordinator.

B. NATURE CONSERVATION

The Agency has under its jurisdiction enforcement of the Nature Conservation Law, The Natural Parks Law, the Wildlife Protection and Hunting Law, the Law relating to the Regulation of Transfer of Special

Birds, and the Law for the Regulation, etc., of the Transfer of Endangered Species of Wild Fauna and Flora.

C. POLLUTION CONTROL

Matters coming under the jurisdiction of the Agency include establishment of environmental standards, enforcement of the Air Pollution Control Law, the Water Pollution Control Law and other laws relating to environmental pollution control.

2. ORGANIZATION

A. DIRECTOR GENERAL OF THE ENVIRONMENT AGENCY

The head of the Environment Agency is called a Director - General and is appointed to the Cabinet with the rank of a Minister of State. When the Director-General deems it is necessary for the protection the environment, he has the power to request information or explanations from the heads of other administrative agencies. He is also empowered to make recommendations to them with respect to important matters. When the situation so warrants, he can recommend the Prime Minister that steps be taken under Article 6 of the Cabinet Law to direct and supervise administrative agencies in accordance with the policies decided upon by the Cabinet.

B. SUBDIVISIONS AND ANCILLARY BODIES

The Agency comprises 4 bureaus: Planning and Coordination, Nature Conservation, Air Quality and Water Quality -and 2 departments- Global Environment and Environmental Health - in additon to Minister's Secretariat. The Agency is divided into 24 divisions, 9 offices.

As ancillary bodies to the Agency, The Training Institute for Environmental Pollution Control undertook its works on March 1, 1973, and the National Institute for Environmental Studies was established on March 15, 1974. But the Training Institute for Environmental Pollution Control was absorbed into the National Institute for Environmental Studies on July 1, 1990 so as to integrate environmental training and environmental studies. The Pollution related Health Damage Compensation Grievance Board was established on September 1, 1974 and the National Institute for Minamata Disease was established on October 1, 1978. In additional, there are in operation the Central Council for Environmental Pollution Control, the Nature Conservation Control, the Seto Inland Sea Environmental Conservation Council, and the Special Certification Council for Minamata Disease.

APPENDIX D

JAPAN'S OFFICIAL DEVELOPMENT ASSISTANCE CHARTER

From: Economic Cooperation Bureau, Outlook of Japan's Economic Cooperation, (1992)
1-7.

JAPAN'S OFFICIAL DEVELOPMENT ASSISTANCE CHARTER

In order to garner broader support for Japan's Official Development Assistance (ODA) through better understanding both at home and abroad and to implement it more effectively and efficiently, the Government of Japan has established the following Charter for its ODA.

1. BASIC PHILOSOPHY

Many people are still suffering from famine and poverty in the developing countries, which constitute a great majority among countries in the world. From a humanitarian viewpoint, the international community cannot afford to ignore this fact.

The world is now striving to build a society where freedom, human rights, democracy and other values are ensured in peace and prosperity. We must recognize the fact of interdependence among nations of the international community that stability and further development of the developing world is indispensable to the peace and prosperity of the entire world.

Environmental conservation is also a task for all humankind, which all countries, developed and developing alike, must work together to tackle.

It is an important mission for Japan, as a peace-loving nation, to play a role commensurate with its position in the world to maintain world peace and ensure global prosperity.

Bearing these points in mind, Japan attaches central importance to the support for the self-help efforts of developing countries towards economic take-off. It will therefore implement its ODA to help ensure the efficient and fair distribution of resources and "good governance" in the developing countries through developing a wide range of human resources and socioeconomic infrastructure, including domestic systems, and through meeting the basic human needs (BHN), thereby promoting the sound economic development of the recipient countries. In doing so, Japan will work for globally sustainable development while meeting the requirements of environmental conservation.

Such assistance is expected to further promote the existing friendly relations between Japan and all other countries, especially in the developing world.

2. PRINCIPLES

Taking into account comprehensively each recipient country's requests, its socio-economic conditions, Japan's bilateral relations with the recipient country, Japan's ODA will be provided in accordance with the principles of the United Nations Charter (especially sovereign equality and

non-intervention in domestic matters), as well as the following four principles:

1. Environmental conservation and development should be pursued in tandem.

2. Any use of ODA for military purposes or for aggravation of international conflicts should be avoided.

3. Full attention should be paid to in recipient countries' military expenditures, their development and production of mass destruction weapons and missiles, their export and import of arms, etc., so as to maintain and strengthen international peace and stability , and from the viewpoint that developing countries should place appropriate priorities in the allocation of their resources on their own economic and social development.

4. Full attention should be paid to efforts for promoting democratization and introduction of a market-oriented economy, and the situation regarding the securing of basic human rights and freedoms in the recipient country.

3. PRIORITY

(1) Regions

Historically, geographically, politically and economically, Asia is a region close to Japan. East Asian countries, especially, member countries of the Association of South Asian Nations (ASEAN) constitute one of the most economically dynamic regions in the world, and it is important for the world economy as a whole to sustain and promote the conomic development of these countries. There are, however, some Asain countries where large segments of the population still suffer from poverty. Asia, therefore, will continue to be a priority region for Japan's ODA.

It is also necessary to be mindful of the poverty and the economic difficulties in the world as a whole. Japan will therefore extend cooperation, befitting its position in the world, to Africa, the Middle East, Central and South America, Eastern Europe, and Oceania. Due consideration will be paid in particular to Least Developed Countries (LLDC).

(2) Issues

(A) Approach to Global Problems

Recognizing that it is important for developed and developing countries to cooperate in tackling global problems such as the environment

and population, Japan will support efforts being made by developing countries to overcome these problems.

(B) Basic Human Needs

To help people suffering from famine and poverty, refugees and others, Japan will provide assistance to the basic human needs (BHN) sector and emergency humanitarian aid.

(C) Human Resources Development and Research and Other
Cooperation for Improvement and Dissemination of Technologies

A priority of Japan's ODA will be placed on assistance to human resources development which, in the long-term, is the most significant element of self-help efforts towards socio-economic development and is a basic factor for the nation-building of developing countries. Japan will also promote cooperation for the improvement and dissemination of technologies, such as research cooperation which will raise the research and development as well as adaptive capabilities of developing countries.

(D) Infrastructure Improvement

Priority will be placed on assisting infrastructure development, which is a prerequisite to socio-economic development.

(E) Structural Adjustment

Japan will provide support to structural adjustment, so that the entrepreneurship and the vitality of the private sector in recipient countries can be fully exerted in the market mechanisms, and to their efforts for the solution of the accumulated debt problems.

4. MEASURES FOR THE EFFECTIVE IMPLEMENTATION OF OFFICIAL DEVELOPMENT ASSISTANCE

(1) Japan will promote intensive policy dialogues with recipient countries, with a view to collecting and analyzing relevant information on these countries, and sharing with them basic perceptions on their development policies, taking into account their request and ideas.

(2) To respond to the various needs of developing countries in different stages of development, Japan's ODA will take advantage, to the maximum extent possible, of the merits of loans, grants, technical cooperation and other forms of assistance. All of these forms of assistance will be organically linked together and coordinated.

(3) When called for, there will be appropriate communication and cooperation with aid agencies of other donor countries, United Nations agencies and international financial institutions, as well as Japanese local

governments and private organizations such as labor and business organizations. In particular efforts will be made to ensure that Japan's perspective on ODA is adequately reflected in the cooperation through international organizations, while taking full advantage of the expertise and political neutrality of these organizations. There will also be cooperation with and appropriate support to non-governmental organizations (NGOs), while respecting their independence.

(4) Japan's own development policies and experiences, as well as those of countries in East and Southeast Asia which have succeeded in economic take-off, will be put to practical use.

(5) In implementing environmental ODA, Japan will make the best use of its technology and know-how, which it has acquired in the process of successfully making environmental conservation and economic development compatible.

(6) In order to contribute to the transfer of technology suitable for the level of development of the recipient countries, Japan will promote the development of relevant technologies and will provide such assistance as will enable the adequate utilization of the knowledge and technologies possessed by other developing countries.

(7) In transferring technology and know-how, Japan will make use of those possessed by the Japanese private sector as well as by the government, and

provide support for technical cooperation by the private sector.

(8) In order to cope with transnational regional problems, Japan will cooperate more closely with international organizations and other frameworks for regional cooperation such as the Asia- Pacific Economic Cooperation (APEC).

(9) A close relationship will be maintained between ODA, direct investment and trade, so that those three can promote the development of developing countries organically. For this purpose, ODA will be more closely linked to and be supportive of economic cooperation in the private sector through trade insurance and such organizations as the Export-Import Bank of Japan.

(10) Cooperation and research to find and formulate adequate development projects will be enhanced. For the future improvement of its ODA, project evaluations, including third party evaluations and joint evaluations with recipients and other donors and organizations will also be strengthened.

(11) Regional studies of developing countries, studies of development policy, and comprehensive evaluation of ODA will be further promoted.

(12) Full consideration will be given to the active participation of women in development, and to their obtaining benefits from development.

(13) Full consideration will be given to the socially weak, such as the

disadvantaged, children and the elderly.

(14) Consideration will be given to redressing the gap between the rich and the poor and the gap among various regions in developing countries.

(15) Japan's ODA activities will be conducted with full care to see that they do not lead to injustice or corruption in the recipient countries.

5. MEASURES TO PROMOTE UNDERSTANDING AND SUPPORT AT HOME AND ABROAD

The following measures will be adopted to ensure that Official Development Assistance is implemented with public understanding both at home and abroad and to secure the participation of the Japanese people.

(1) Making ODA Information Public

While taking into account such matters as diplomatic relations with recipient countries, more information regarding ODA activities will be made open to the Diet and to the public.

(2) Enhancement of Public Relations and Development Education

Organized public relations activities and educational programs on development assistance will be promoted.

APPENDIX E

KEIDANREN GLOBAL ENVIRONMENT CHARTER

APRIL 23, 1991

KEIDANREN GLOBAL ENVIRONMENT CHARTER

April 23, 1991

Keidanren (Japan Federation of Economic Organizations) is a private, non-profit economic organization representing virtually all branches of economic activities in Japan. Keidanren, maintaining close contact with both public and private sectors at home and abroad, endeavors not only to find practical solutions to economic problems but also to contribute to the sound development of the economies of Japan and countries around the world.

Through the merger of several economic and industrial organizations active since prewar days, Keidanren was established in August 1946. Since then, Keidanren has grown into a nation-wide body with 122 association and 939 corporate members as of May 1991.

Keidanren Global Environment Charter

Keidanren
April 23, 1991

Introduction

Japan has been actively striving to protect the environment, promote health and safety, and use energy and resources more efficiently ever since pollution became a problem in the high-growth 1960s and especially since the two oil crises of the 1970s, and now has some of the most advanced technologies and systems in the world to reduce industrial pollution, enhance safety and hygiene, and conserve energy and other resources.

Yet, today's environmental problems are too critical to be dealt with solely through measures to prevent industrial pollution. If we are to minimize the load on the environment from, for example, waste disposal and water pollution generated in cities, society itself must be fundamentally changed. We must radically revise various social and economic systems, such as the layout of cities and the arrangement of transport networks, and we must also upgrade social infrastructure and, indeed, raise the consciousness of citizenry.

On the international agenda are such world-scale problems as global warming, the depletion of tropical rain forests, desertification, acid rain, and pollution of the oceans. The international community's

response to the problem of global warming in particular will be having profound effects on our ways of life and business. Naturally, there must be overall measures taken, but technological breakthrough will also be necessary. The problems are such that no country alone can come up with all the answers.

The task before us is not merely one of rethinking the problems caused by the pursuit of affluence in a culture that encourages mass consumption; we must also come to grips with the global problems of poverty and population increase, aiming to hand over to future generations a healthy environment that allows sustainable development on a global scale. The governments, companies and people of each nation must become more aware of their roles in this endeavour. People throughout the world must join hands to create new social and economic systems that allow the advancement of the welfare of all human beings and the conservation of the whole world's environment.

Japan must not rest content with its good record in pollution control thus far. The business world, academic circles and government must pool their resources to create innovative technologies for preserving the environment, conserving energy and cutting back on resource consumption. While drawing on the Japanese experience in reconciling economic development with environmental protection, we must actively participate in international environmental undertakings. Concerning such problems as global warming, we should support the efforts on more scientific research into their causes and effects and

also begin to work immediately on the feasible countermeasures.

By showing that it takes environmental problems seriously, the business world can gain the trust and sympathy of the public. This will foster a mutually beneficial relationship between producers and consumers, thereby encouraging the healthy development of the economy. With the above situation in mind, Keidanren offers the guidelines outlined below to its members. It is to be hoped that each member, always consulting with and seeking the understanding and cooperation of consumers, government officials and others, will conduct its business in conformity with these guidelines.

Basic Philosophy

A company's existence is closely bound up with the global environment as well as the community it is based in. In carrying on its activities, each company must maintain respect for human dignity, and strive toward a future society where the global environment is protected.

We must aim to construct a society whose members cooperate together on environmental problems, a society where sustainable development on a global scale is possible, where companies enjoy a relationship of mutual trust with local citizens and consumers, and where they vigorously and freely develop their operations while preserving the environment. Each company must aim at being a good global corporate citizen, recognizing that grappling with

environmental problems is essential to its own existence and its activities.

Guidelines for Corporate Action

Companies must carry on their business activities to contribute to the establishment of a new economic social system for realizing an environmentally protective society leading to the sustainable development.

1. General Management Policies

Companies should always consult the guidelines below in carrying on their activities. They must work to (1) protect the global environment and improve the local living environment, (2) take care to protect ecosystems and conserve resources, (3) ensure the environmental soundness of products and (4) protect the health and safety of employees and citizens.

2. Corporate Organization

(1) Companies shall establish an internal system to handle environmental issues by appointing an executive and creating an organization in charge of environmental problems.

(2) Environmental regulations shall be established for company activities, and these shall be observed. Such internal regulations shall

include goals for reducing the load on the environment. An internal inspection to determine how well the environmental regulations are being adhered to shall be carried out at least once a year.

3. Concern for the Environment

(1) All company activities, beginning with the siting of production facilities, shall be scientifically evaluated for their impact on the environment and any necessary countermeasures shall be implemented.

(2) Care shall be taken in the research, design and development stages of making a product to lessen the possible burden on the environment at each level of its production, distribution, appropriate use and disposal.

(3) Companies shall strictly observe all national and local laws and regulations for environmental protection and where necessary they shall set additional standards of their own.

(4) When procuring materials, including materials for production, companies shall endeavour to purchase those that are superior from such viewpoints as conserving resources, preserving the environment and enhancing recycling.

(5) Companies shall employ technologies that allow efficient use of energy and preservation of the environment in their production and

other activities. Companies shall endeavour to use resources efficiently and reduce waste products through recycling and shall appropriately deal with pollutants and waste products.

4. Technology Development

In order to help solve global environmental problems, companies shall endeavour to develop and supply innovative technologies, products and services that allow conservation of energy and other resources together with preservation of the environment.

5. Technology Transfers

(1) Companies shall seek appropriate means for the domestic and overseas transfer of their technologies, know-how and expertise for dealing with environmental problems and conserving energy and other resources.

(2) In participating in official development assistance projects, companies shall carefully consider environmental and antipollution measures.

6. Emergency Measures

(1) If environmental problems ever occur as a result of an accident in the course of company activities or deficiency in a product, companies shall adequately explain the situation to all concerned

parties and take appropriate measures, using their technologies and human and other resources, to minimize the impact on the environment.

(2) Even when a major disaster or environmental accident occurs outside of a company's responsibilities, it shall still actively provide technological and other appropriate assistance.

7. Public Relations and Education

(1) Companies shall actively publicize information and carry out educational activities concerning their measures for protecting the environment, maintaining ecosystems and ensuring health and safety in their activities.

(2) The employees shall be educated to understand the importance of daily close management to ensure the prevention of pollution and the conservation of energy and other resources.

(3) Companies shall provide users with information on the appropriate use and disposal, including recycling, of their products.

8. Community Relations

(1) As community members, companies shall actively participate in activities to preserve the community environment and support employees who engage in such activities on their own initiative.

(2) Companies shall promote dialogue with people in all segments of society over operational issues and problems seeking to achieve mutual understanding and strengthen cooperative relations.

9. Overseas Operations

Companies developing operations overseas shall observe the Ten-Points- Environmental Guidelines for the Japanese Enterprises Operating Abroad in Keidanren's Basic Views of the Global Environmental Problems (April 1990) (see Attachment9.

10. Contribution to Public Policies

(1) Companies shall work to provide information gained from their experiences to administrative authorities, international organizations and other bodies formulating environmental policy, as well as participate in dialogue with such bodies, in order that more rational and effective policies can be formulated.

(2) Companies shall draw on their experience to propose rational systems to administrative authorities and international organizations concerning formulation of environmental policies and to offer sensible advice to consumers on lifestyles.

11. Response to Global Problems

(1) Companies shall cooperate in scientific research on the causes and effects of such problems as global warming and they shall also cooperate in the economic analysis of possible countermeasures.

(2) Companies shall actively work to implement effective and rational measures to conserve energy and other resources even when such environmental problems have not been elucidated by science.

(3) Companies shall play an active role when private sector's help is sought to implement international environmental measures, including work to solve the problems of poverty and overpopulation in developing countries.

Ten-Points-Environmental Guidelines
for the Japanese Enterprises Operating Abroad

1. Establish a constructive attitude toward environmental protection and try to raise complete awareness of the issues among those concerned.
2. Make environmental protection a priority at overseas sites and, as a minimum requirement, abide by the environmental standards of the host country. Apply Japanese standards concerning the management of harmful substances.
3. Conduct a full environmental assessment before starting overseas business operations. After the start of activities, try to collect data and, if necessary, conduct an assessment.
4. Confer fully with the parties concerned at the operational site and cooperate with them in the transfer and local application of environment-related Japanese technologies and know-how.
5. Establish an environmental management system, including the appointment of staff responsible for environmental control. Also, try to improve qualifications for the necessary personnel.
6. Provide the local community with information on environmental

measures on a regular basis.

7. Be sure that when environment-related issues arise, efforts are made to prevent them from developing into social and cultural frictions. Deal with them through scientific and rational discussions.

8. Cooperate in the promotion of the host country's scientific and rational environmental measures.

9. Actively publicize, both at home and abroad, the activities of overseas businesses that reflect our activities on the environmental consideration.

10. Ensure that the home offices of the corporations operating overseas understand the importance of the measures for dealing with environmental issues, as they affect their overseas affiliates. The head office must try to establish a support that can, for instance, send specialists abroad whenever the need arises.

APPENDIX F

INDUSTRY AND THE ENVIRONMENT PAIN IN JAPAN

From: The Economist, December 11th, 1993: 69-70.

would like to add an American partner, too. They are still talking to AT&T.

Originally, Deutsche Telekom and France Télécom had envisaged a full merger of all their global telecoms operations. That was scuppered, however, by an outcry from their competitors (such as BT) and by fears that the European Commission might reject the deal. The two firms now insist they will combine forces only in the bits of the European Union's telecoms market that have already been deregulated. That means the venture must stay away from plain old voice telephony, which will not be fully liberalised until 1998.

Some of Deutsche Telekom's and France Télécom's competitors suspect, however, that the two firms will drift ever closer together—the pair already speak of taking stakes in each other if and when they are privatised—and will seek to lock out competition. The partners would doubtless like to establish and control a pan-European data network to rival America's embryonic "information superhighway". That would give the two firms pan-European monopoly power just as their stranglehold on ordinary telephone service was being loosened.

All this assumes that the Franco-German alliance thrives. If BT's early attempts at offering global telecoms services to multinationals are anything to go by, Deutsche Telekom's and France Télécom's venture could lose money for years—in a market which may prove much smaller than they now imagine. And closer links between the two firms could be foiled by politics. While Germany is pressing ahead with plans to sell off Deutsche Telekom, Gérard Longuet, France's industry minister, says privatisation of France Télécom is off the agenda.

Industry and the environment

Pain in Japan

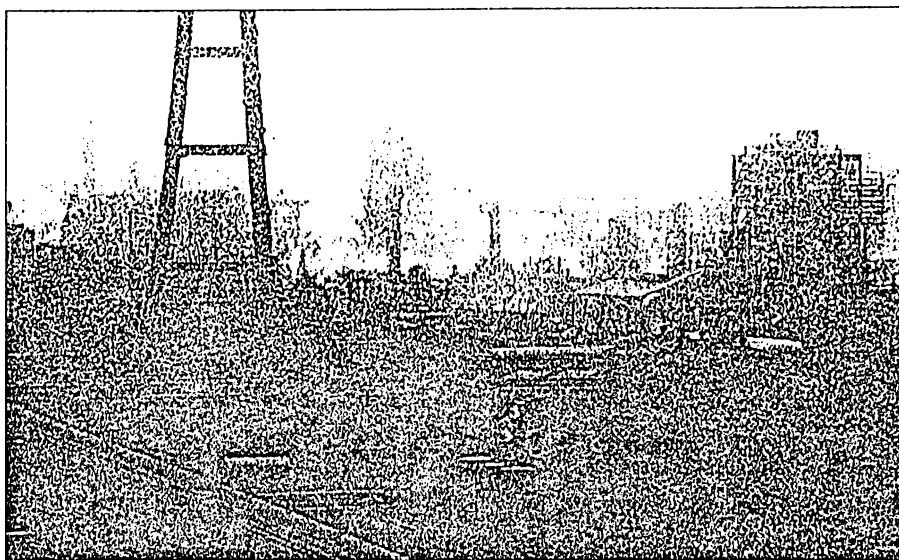
TOKYO

IN A recession, most governments go soft on green issues. However, for the past year Japan's hard-pressed businessmen have faced increasing government pressure to raise environmental standards. Last month an ambitious new "basic environmental law" came into force. A newly appointed environment council is now discussing how to implement the law through new taxes and stricter pollution controls. It hopes to put a package of measures together by March 1994.

The government's strategy has both a

foreign-policy and a commercial motive. Environmental issues, the government has decided, offer a chance for Japan to play a bigger role on the world stage. It also thinks that Japan can make money out of green technology. In the 1970s hideous pollution associated with fast growth forced Japan to introduce some of the toughest environmental standards in the world. Japanese companies developed green technology—especially for curbing air pollution—which was so good that they cleaned up in export markets as well as at home.

Japanese politicians have also noticed that green taxes may be becoming easier to sell than other taxes. Until recently, the Nature Conservation Society of Japan, the country's biggest environmental action group, counted a mere 3,000 members; now



Green satanic mills

Paper profits

NEW YORK

EVERY year America's Treasury takes nearly \$36 billion in old notes out of circulation. Until recently this treasure trove had to be burnt, or shredded and sent to a landfill. Now some of the money is returning as recycled stationery. The beneficiary, appropriately enough, is Crane & Company, a family-owned firm from Massachusetts which has provided paper to the Treasury ever since 1879, 18 years after the United States first issued a national paper currency.

"Old Money", as the product is known, was launched recently for social stationery (Crane is one of the leading suppliers of the paper used for smart invitations). Next year, the company will roll out Old Money paper for letterhead paper, cheques, annual reports and so on.

Crane reckons it will be able to use the entire 6,750 ton (6,123 tonnes) annual output of the 12 Federal Reserve districts. So far it munches up only 250 tons: all the \$1.3 billion that Cleveland destroys plus a bit of New York's.

The reason why nobody has done this before is the difficulty of recycling the notes without creating more waste from the ink. Crane has turned this colour defect into its selling point. Rather than try to produce all-white paper, the firm came up with a sage-hued product, with an abnormally high content of used notes: 70% of all the material—well above the 20% minimum the Clinton administration recently set for recycled paper used by federal agencies.

Crane picked up its taste for this

stained look by making paper from scrap denim for Levi Strauss. By reducing the indigo dye content by 90%, Crane has created a new family of "Denim Blues" bluetint cotton papers that it has just released. Levi Strauss itself uses the paper for its business letterhead, payroll cheques, manufacturing pattern paper, hang tags and packaging. In the process, it saves around 40,000 trees a year—and it has reduced stationery costs by 12%. Next year, the San Francisco-based clothing firm plans to introduce pencils that use denim instead of wood.

Crane has now spotted a new opportunity for recycling waste in its own business. It has just received permission from the state of Massachusetts to classify its mill sludge as a "soil amendment", so it can be sold as artificial topsoil. Potential customers include the farmers who produce the cotton which makes the denim that makes the paper. How green.

it has 20,000 individuals and 10,000 institutions, including local governments and companies. This is still small beer compared with the 630,000-member Sierra Club in America, but Japanese environmentalists have chalked up some small victories, such as stopping logging projects.

This frightens Japan's businessmen, who are adamant that they do not need government prodding (or new taxes) to improve their green credentials. They argue that commercial reality, existing laws and pressure from customers are already forcing

them down the road of verdant virtue. A recent survey of 622 Japanese firms carried out by Nikkei Research, a consultancy, found that 70% of them already had a division devoted to environmental matters; over half had a board member with responsibility for the environment. Most of Japan's larger companies have produced "action plans" setting targets for what they intend to achieve on pollution control.

Several firms have recently stepped up their investment in environmental research. For instance, Tokyo Electric Power

Company (TEPCO) has built a ¥1 billion (\$9m) research facility dedicated to finding ways of removing carbon dioxide from industrial emissions. TEPCO's action plan also promises to reduce its own carbon-dioxide emissions. It has been circulated to academics, green lobby groups, Japanese politicians and even to Al Gore, America's vice-president.

The action plan of NEC, an electronics giant, promises to reduce waste at its factories by half. In April NEC, which once bought 3% of the world's supply of ozone-depleting CFCs (to clean its computer chips), announced that it was no longer using them. And instead of throwing away its silicon waste, NEC now sells it to the cement industry. Indeed, NEC claims that 20% of the cost of a typical big semiconductor factory is now spent on environmental measures—compared with 10% five years ago.

Other recent examples of corporate greenery range from alcohol producers agreeing to preach the virtues of recycling empty aluminium cans to the Tokio Marine and Fire Insurance company's setting up of a green publishing house (it has spotted that environmental liability is an issue of growing concern to insurers). Self-interest is also prompting a few Japanese companies to clean up their overseas operations. Many were stunned by a Malaysian court's decision in 1992 to order Mitsubishi Kasei to close a chemical plant, after local activists had complained about radioactive waste (the court has since stayed this order). Japanese firms are learning to be more careful about how they act abroad, especially in other Asian countries that may soon tighten their own green standards (see page 60).

Will all this green activity be enough to head off tougher laws at home? Much depends on the Ministry of International Trade and Industry (MITI), which, while keen to develop exportable green technologies, has so far preferred to offer carrots to companies, not sticks. In its first draft, the new environmental law would have forced companies to fill out environmental-impact assessment reports before building factories or power stations. In its final form—after behind-the-scenes negotiations with MITI—the law merely suggests that such restrictions might one day be a good idea.

MITI has also helped industrialists to fight off laws that would have made companies responsible for their non-toxic leftovers. However, MITI admits that in seven years Japan will have nowhere to dump its industrial waste. Few local municipalities can afford to install enough incinerators, putting extra pressure on companies to help out. Such practical pressures may make it harder for MITI to resist its political masters over environmental taxes and pollution controls. Despite their recent flurry of greenery, Japanese firms still look exposed.

Bug wars

A DECADE ago, scientists at Schering-Plough, an American drug company, discovered a promising antibiotic in a class called the everninomycins. Instead of developing the drug, the firm shelved it. The market was overflowing with good antibiotics, little distinguished from one another and all plagued by ever-falling prices. Drug firms reckoned their dollars were better spent chasing viral infections such as AIDS, or fungal ones with few curative drugs.

Now Schering-Plough is reviving its work on everninomycins. The antibiotics market, which was worth \$15 billion last year, is also attracting new research by firms such as Britain's Glaxo and America's Lederle. The reason: people have been too cocky about bacterial infections. In the deadly "arms race" between microbe and man, bugs such as the one that causes tuberculosis are evolving with alarming speed towards immunity from existing antibiotics.

Part of the solution lies in wiser use of medicines already on the market. But there could also be profits in developing new antibiotics to replace tired old ones. Some will be variations on traditional lines; others may take a completely different approach. Recent progress in antibiotics has been incremental, not revolutionary, says Calvin Kunin of Ohio State University. The biggest advances have come in testing, where trial and error has been replaced by computer modelling; in genetic engineering; and in better knowledge of how microbes work.

Small biotech firms are seizing the chance to create new drugs that can pierce the microbes' armour. Microcide, a Californian start-up, is targeting niche markets, such as infections spread in hospitals, that it feels are ignored by the industry's giants. Several other American firms, such as Amgen and Alpha-Beta Technology, want to harness the immune system's own ability to fight



Fleming started it

microbes. Magainin Pharmaceuticals, which is developing a substance derived from frogs that attacks bacterial membranes, has support from both America's Colgate-Palmolive and Switzerland's Sandoz. Other firms hope that liposomes (tiny capsules injected into the bloodstream) might help aim antibiotics at their targets more precisely.

These biotech alternatives may take years to perfect. So updates of more familiar remedies could lead the way. SmithKline Beecham, an Anglo-American giant, and America's Pfizer, both already sell antibiotics that use chemical decoys and other tricks to get at drug-resistant bacteria. Yet antibiotics remain an economic gamble. Companies know that sales in rich countries are needed to cover their development costs; yet it is poor countries that have all but a tiny fraction of infected patients. The spread of infections is also harder to predict than the incidence of cancer or genetic diseases. The health of huge numbers of people could rest on whether other drug companies decide to follow Schering and take the antibiotic plunge.

APPENDIX G

TABLES AND FIGURES

Table G 1: Per Capita Emissions of SO_x and NO_x

Country	Year	SO _x Emissions (Kg/person)	NO _x Emissions (Kg/person)
Japan	1986	6.9	9.7
Canada	1985	145.8	77.1
U.S.A.	1986	87.7	79.9
France	1987	27.3	29.7
U.K.	1987	67.9	67.9
FRG	1987	36.4	48.6
Italy	1986	26.6	27.7
Sweden	1987	26.2	35.7

Source: OECD, Environmental Data, (1989).

Table G 2: Atmospheric Environment Standards in Japan, the United States and Former West Germany

		Japan	U.S.A.	Former West Germany
SO ₂	Per Day	0.04	0.14	-
	Per Year	-	0.03	0.05
NO ₂	Per Day	0.04-0.06	-	-
	Per Year	0.02-0.03	0.05	0.04

Source: Industrial Pollution, (July, 1987). Vol. 23, No.7.

Table G 3: Scheduled Phase-out of CFC's by Major Corporations

Corporation	Annual Usage (fiscal 1988, tons)	Projected year of Phase-out of use	Uses
Hitachi	3.200	2000	Detergent
Kanegafuchi Chemical Industry	2.000	1991	Foaming Agent
Matsushita Group	4.800	1995	Detergent
Seiko Epson	1.400	1993	Detergent
Sharp	1.800	1995	Detergent
Shiseido	1.200	1990	Aerosol Propellant
Toshiba	2.000	1995	Detergent

Note: Only corporations that used more than 1.000 tons in 1988 are listed.

Source: Ministry of Foreign Affairs, How Japan is Dealing with Global Environmental Issues (1990).

Table G 4: Proposed Budget of the Japanese Government for Fiscal Year (FY) 1992 and Budget for Fiscal Year 1991 for Global Environmental Conservation (100 Million yens)

Category 1	FY 1991 Budget	FY 1992 Budget Proposal	Change (%)
1. General Expenditure	761	880	+15.6
2. Satellite and Other Research Equipment	296	245	-17.2
3. Energy Programmes	3.736	3.843	+2.9
4. Miscellaneous	15	16	+6.7

Category 2	FY 1991 Budget	FY 1992 Budget Proposal	Change (%)
1. Formulation of an International Framework	87	94	+8.0
2. Observation, Monitoring, Research and Development	758	730	-3.7
3. Technology Development and Diffusion	3.898	4.062	+4.2
4. ODA in Environmental Fields	22	34	+54.5
5. Environmental Consideration	38	57	+50.0
6. Public Awareness and Education for Global Environmental Conservation	5	7	+40.0

Category 3	FY 1991 Budget	FY 1992 Budget Proposal	Change (%)
1. Global Warming	3.848	3.967	+3.1
2. Depletion of the Ozone Layer	25	33	+32.0
3. Acid Rain	69	104	+50.7
4. Marine Pollution	30	35	+16.7
5. Transboundary Movement of Hazardous Waste	1	1	-
6. Deforestation (particularly tropical forests)	55	59	+7.3
7. Decreasing Species of Wild Fauna and Flora	4	6	+50.0
8. Desertification	5	7	+40.0
9. Environmental Pollution in Developing Countries	10	16	+60.0
10. Unable to Categorize	761	756	-0.7

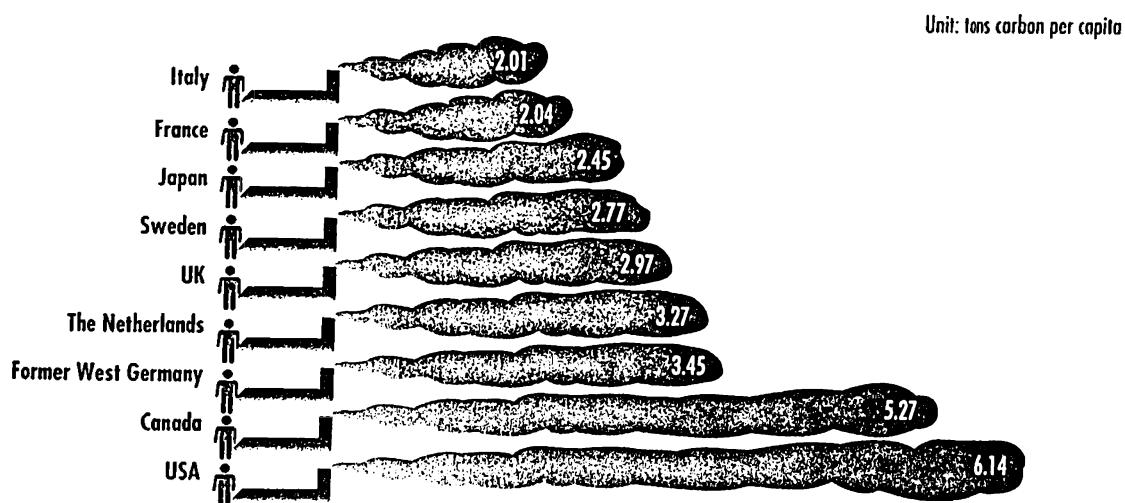
Source: Environment Agency, Government of Japan, Quality of the Environment in Japan (1992).

Table G 5: Examples of Cooperative Achievements

Forest preservation, environmental protection	Brazil	• Forestry research, São Paulo, 1979-86	Project-type technical cooperation
	China	• Daxing'anling forest fire damage reclamation project, 1988	Grant aid
	Ecuador	• Forest resources survey, northeast region, 1984-88	Development survey
	Indonesia	• Forestation, southern Sumatra, 1979-88	Project-type technical cooperation
		• Tropical forest reforestation research center construction project, 1979	Grant aid
	Kenya	• Training in raising tree seedlings, 1985-87	Project-type technical cooperation
		• Construction project for a center for the above, 1986	Grant aid
	Malaysia	• Forestation technology training, Sabah Province, 1987-92	Project-type technical cooperation
	Myanmar	• Central forestry development and training center construction project, 1987	Grant aid
	Nigeria	• On-site survey on the preservation and development of forest resources in semi-arid areas, 1986	Development survey
	Papua New Guinea	• National forest laboratory construction project, 1987	Grant aid
	Paraguay	• Forestation, central Paraguay, 1987-92	Project-type technical cooperation
	Philippines	• Forestry development, Pantabangan, 1976-92 (two projects)	Project-type technical cooperation
		• Forest preservation training center construction project, Pantabangan, 1978	Grant aid
		• Forest firefighting equipment improvement project, Pantabangan, 1984	Grant aid
	Senegal	• Forest fire prevention project	Grant aid
	Tanzania	• Kilimanjaro forestry development project, 1985-88	Development survey
	Thailand	• National-forest management project, 1984-87	Development survey
Pollution prevention	Brazil	• Mining pollution prevention, 1981-85	Project-type technical cooperation
	Chile	• Mining pollution prevention, 1987-91	Project-type technical cooperation
	China	• Air pollution prevention project, Shanghai, 1985-87	Development survey
	Egypt	• Sewage system improvement project, Sharqiya Province, 1985-88	Development survey
	Indonesia	• Municipal waste management project, Jakarta, 1985-87	Development survey
	Malaysia	• Waste treatment project, Penang, 1987	Development survey
	Mexico	• Air pollution survey, Mexico City, 1986-88	Development survey
	Paraguay	• Water pollution prevention project, Lake Ypacarai watershed, 1986-	Development survey
	Republic of Korea	• Mining disaster prevention, 1984-88	Project-type technical cooperation
	Thailand	• Water quality improvement project, Bangkok	Development survey
		• Environmental research and training center, 1989	Grant aid
	Turkey	• Air pollution prevention project, Ankara, 1982-85	Development survey
	United Arab Emirates	• Measures to counteract oily sea water at an electric power generation and desalination plant, 1987-	Development survey
	Environmental administration and environmental pollution prevention technology Experts are dispatched for such fields as environmental sanitation engineering, water pollution management, and air pollution prevention. Trainees studying environmental administration, environmental technology, waste treatment, and other fields are accepted into training courses. Grant aid for the construction of environmental preservation centers in Thailand and China is in the process of being extended or is in the planning stage.		

Source: Ministry of Foreign Affairs, Japan's Environmental Endeavours, 1992.

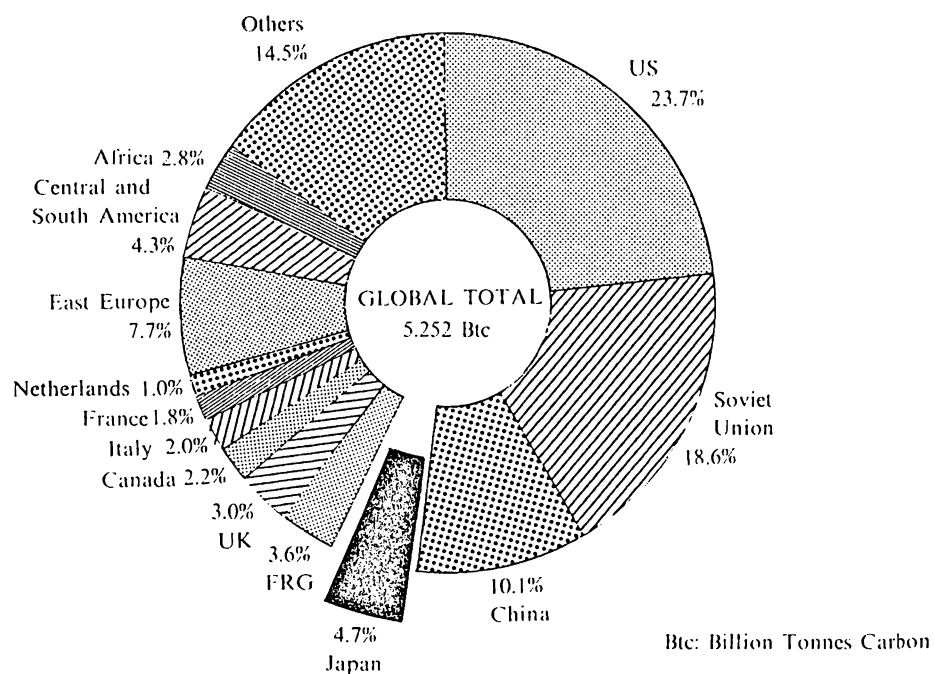
Figure G 1: Comparison of Per Capita Carbon Dioxide Emissions, 1988.



Note: Figures for carbon dioxide are for fossil fuels only.

Source: OECD, Energy Balance, 1988.

Figure G 2: Share of Carbon Dioxide Emissions Through Use of Fossil Fuels in 1987



Source: Environment Agency, Japanese Performance of Energy Conservation and Air Pollution Control (1990), 12.

NOTES

NOTES

- [1]The sense in which "economic development" is used, and hence the starting point for our consideration of the term, is a combination of economic growth associated with industrialization - hereby defined as a process of social and technological change and the assumed benefits this brings in terms of human progress and improvement.
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