Towards a Sustainable Society*

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BASIC THEORIES OF ENVIRONMENTAL PROBLEM : THE JAPANESE EXPERIENCE

1. From serious pollution problems to environmental problems

Ever since the Meiji Restoration, Japan modernized and reformed the country in a western way. The course of modernization took England 300 years but Japan tried to accomplish the same in approximately a hundred years. Such rapid economic growth took place without the development of modern system of law for basic human right and democratization of society. As a consequence, all sorts of pollution and destruction of environment busted out. This is a phenomenon commonly found today in Asian countries.

Pollution control in the pre-World War II era had not been developed much. However, grassroot environmental movements were born and the principles of pollution control as we know today emerged during 1920s. For example, in 1929 de-sulfur dioxide from smoke was put to a practical use first in the world at the copper refinery in the Sumitomo Metal Mine. In 1914, the Hitachi Mine constructed a tallest chimney in the world for air pollution control. Both companies monitored the weather and took regulations accordingly. Osaka City Sanitation Laboratory monitored air pollution 24 hours and regulated smoke. It was a rare case in the world of that time.

However, scientific study of pollution, public opinions and movements against pollution problems were all put on hold until 1939 because of the economy crisis in 1929 and the World War II. The war and economy crisis delayed the development of pollution control not only in Japan, but also across the world. It is apparent in the paper published by WHO, shown in Figure 1.

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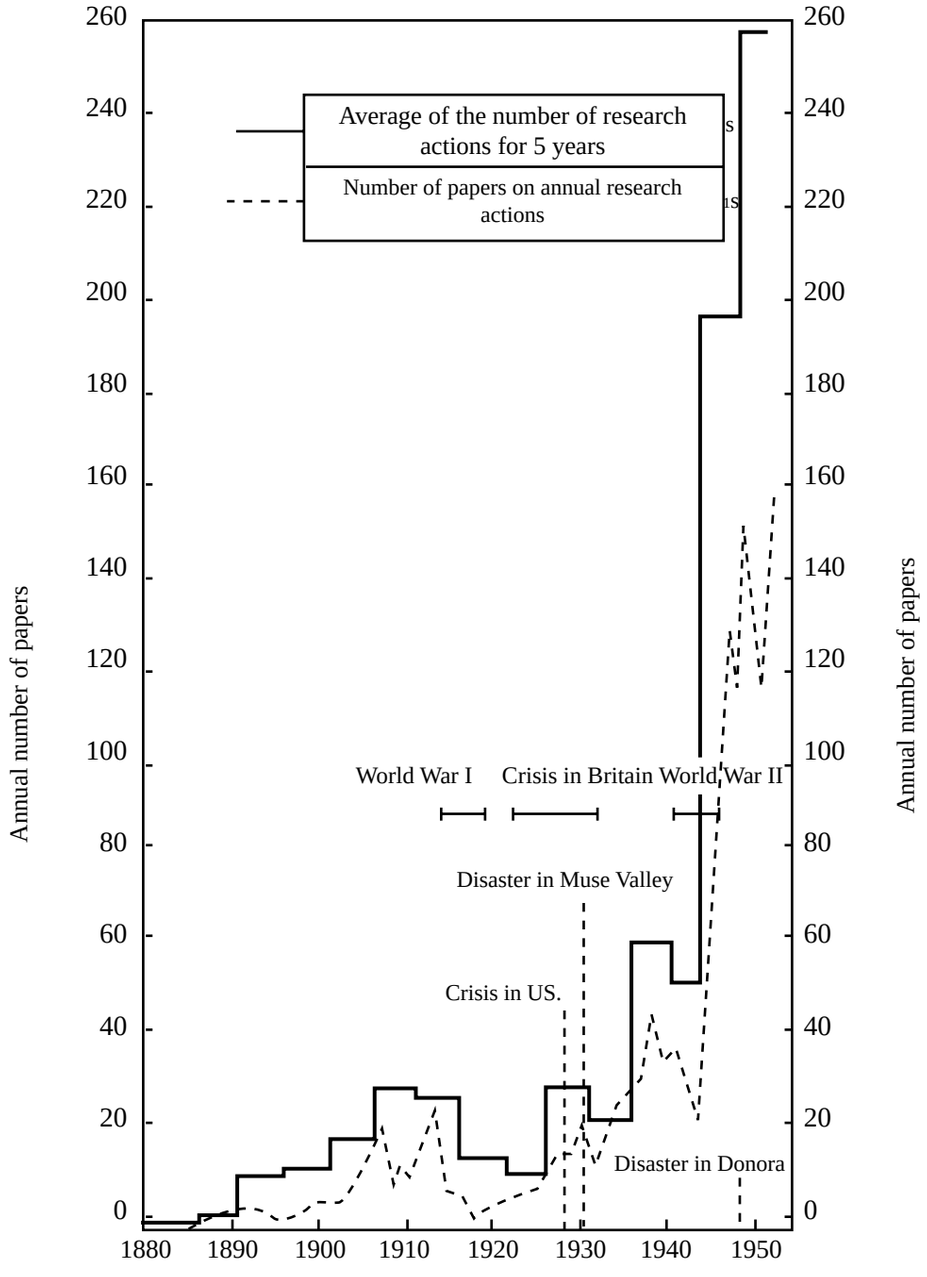

Figure 1. Changes in Technology and Research Action on Air Pollution (Source: E.C.Halliday, "A Historical Review of Atmospheric Pollution" (WHO : Air Pollution,1961))

After World War II, Japan did not resume the practice of pollution control formed during pre World War period. The country was preoccupied by the post- war rapid economic growth. This caused severe pollution in the nation. Two cases of Minamata disease (methyl mercury poisoning) have created approximately 20,000 victims. Itai-Itai disease (cadmium poisoning) created 129 officially- acknowledged victims. Air pollution caused by Yokkaichi Petrochemical Industrial Complex created approximately 1,000 victims. Pollution called a

wide attention from the public and the polluting companies were accused at the court. Pollution in big cities got worse due to the industrialization and rapid growth of the car traffic. City of Osaka had 160 days of smog in 1960. In Nishi-Yodogawa ward, one of the polluted areas, the level of SO_2 went higher than 1-3 ppm on many days. Its average amount per day was more than 0.3 ppm. Pollution created 2000 victims in this area of Osaka. Similar problems appeared throughout the nation. The number of air pollution victims who were acknowledged by the government was as high as 100,000. The polluting companies paid approximately 100 billion yen of compensation every year.

In 1960s, major metropolitan areas and industrial cities in Japan were, literally, the "infernos". If the situation had been left like that, all the residents of those regions would have had some kind of physical malfunctioning. What was responsible for all this? First of all, it was the companies because the companies expanded their business but cut back the investment to prevent the pollution.

Secondly, it was the central and the local government. They are responsible for protecting the environment, our common property. They, however, helped the companies' economic growth or took a weak attitude. They regulated the pollution measures as long as the measures did not harm the companies' economy. Establishment of pollution law delayed. In 1958, the law to regulate industrial waste water and the law to regulate the conservation of water quality were enacted, triggered by a water pollution scandal.

However, these laws were not applicable to Minamata disease which had already occurred before the enforcement of the law. It was finally applied in 1968 when the production of acetaldehyde, the cause of Minamata disease, was already stopped.

The law to prevent air pollution was established, reacting to Yokkaichi air pollution. However, this regulated the emission of SO_2 at 2,200 ppm. This was higher than the 1,900 ppm, the amount of emission of Sumitomo Metal, whom I have referred to earlier in this paper. This is a milder guideline than that of pre-war period. This inevitably caused pollution in Yokkaichi.

Confronted by the movements against pollution which broke out all over Japan, the government established The Basic Law for Pollution Control in 1967 by set the SO_2 emission at the rate of 0.05ppm per year. This was the level of pollution that was actually happening in Shinjuku, Tokyo and Tobata ward, Kitakyushu, the polluted regions in those days. Hence, the regulation of The Basic Law for Pollution Control allowed to create same level of pollution in other areas of the country. With increasing public concern and residents' movements, the government and the corporations were no longer able to carry on without any politics of pollution control.

When the central government and the Shizuoka prefecture planned the construction of a petroleum industrial complex, from 1963 to 1964, residents in Mishima, Numazu, and Shimizu fought against it with the slogan "Don't let us become the second Yokkaichi". Some famous scientists from The National Institute of Genetics and some professional teachers from Numazu Technical High School, who helped the movement, formed an investigation committee. They conducted an environmental assessment and reported that the construction of the industrial plant might cause pollution. Counteracting this, the government formed a

big research committee and implemented environmental assessment for the first time. They insisted that the construction would not cause pollution. The two research committees had debates and the augment of residents were proved to be correct scientifically. With this result and the strong residents' movement, the central government and the prefecture were forced to give up the siting of the complex. This was the first victory won by residents regarding pollution. It became as the model for all environmental protection movements throughout the nation

I co-authored "Osorubeki Kogai" (The terrible pollution, 1964, Iwanami Shoten) with Professor Hikaru Shoji around this time. It was one of the first interdisciplinary works on pollution and induced researchers to conduct more studies of the same kind. In 1970, the Special Committee on Pollution of the International Council of Social Sciences opened its first international symposium on environmental problems in Tokyo with Shigeto Tsuru as the General Secretary. They proposed "Environmental rights". This idea was developed at Rio Conference and served as the theoretical foundation of the United Nations Conference on the Human Environment in Stockholm in 1972.

With public opinion, movements and the progress of the science of pollution, environmental policy in Japan developed in two ways. Firstly, in regions where residents strongly protest against pollution, residents elected progressive governors and mayors who put pollution control regulations on the top of their agendas. The elected mayor would have new environmental policies which will induce the change of environmental policies of the state. For example, a pollution prevention law, set by Tokyo metropolitan government, was more stringent than that of the national standards and forced the latter to change. Secondly, in regions where there were not enough movements against pollution, the victims took the problems to the court. The cases of two Minamata disease, Itai-Itai disease, and air pollution in Yokkaichi are the four biggest lawsuits on pollution in Japan. Especially Yokkaichi trial created a great impact because industrial complex in Yokkaichi was the biggest in all Asia and equipped with the newest technology of the day. The government was forced to set the environmental standards most stringent in the world and established the "Pollution-Related Health Injuries Compensation Law". In addition, its regional development policy, which is the economic-oriented got re-examined.

The effects of these changes are shown in the Figure 2. The corporate investment for pollution prevention was, during in 1960s, almost none. But in 1975, it was 1,000 billion (17.7 percent of all corporate investments in equipment), the highest amount in the world. Table 1 shows the pollution control by local governing bodies. In fiscal year1961, the combined budget and staff for pollution control in the 14 metropolitan areas and prefectures and 16cities, towns and villages was only 14 billion yen with a staff of 300. In fiscal 1974, pollution control staff was created in all the metropolitan areas and prefectures, and in 765 cities, towns, and villages. The combined budget has risen to approximately 1,000 billion yen and the combined staff to 12,317. It is quite unusual to see such drastic changes.

As a result mentioned above, serious pollution such as Minamata disease and Itai Itai disease had been prevented. However, the remaining problems have not been solved yet since then. It is because it takes long time to recover the previous condition and there still exists pollutions caused by other factors, such as automobile and wastes, to be solved. In

addition to those, we have to consider preservation of landscape, protection of nature and global environmental issues.

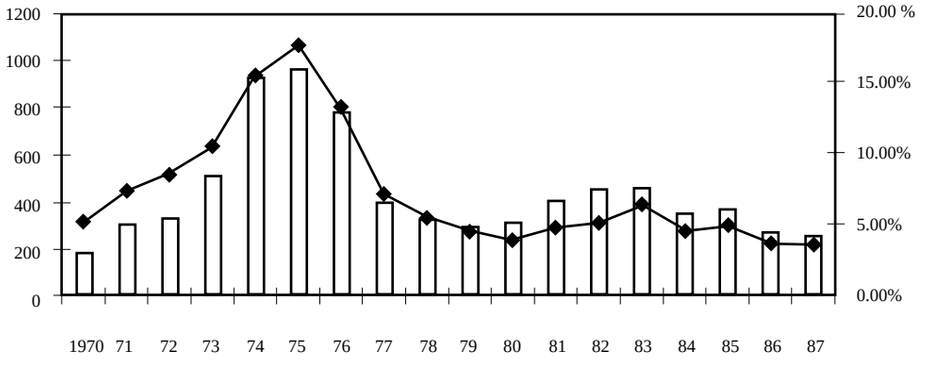

Figure 2. Trend of Private Investment in Anti-pollution Equipment

Table 1. Changes in Environmental Policies of Local Government

	1961		1974		1986		1995	
	Pre-fecture	City, Town Village	Pre-fecture	City, Town Village	Pre-fecture	City, Town Village	Pre-fecture	City, Town Village
Environmental section	14	16	47	765	47	562	47	845
Administrator	300		5,852	6,465	5,865	4,816	6,384	4,534
Budget (hundred million yen)	140		3,501	6,036	8,910	20,800	14,458	46,738
Reduction sewage disposal cost	2		3,838		8,785		17,319	
Local environment act	6	1	47	346	47	496	47	608

2. Lessons to be learned from experiences of Japan

There are some important lessons to be learned from the experiences Japan had in pollution control. I have summarized them in the following section.

A. Pyramid of Environmental Problems

Figure 3 is called the “pyramid of environmental problems”. What this tells us is that illness does not represent all the damage and that we have to reveal what is beneath it. For

example, at the beginning of 1960s, it was reported that the number of Minamata disease patients was 120, and that the disease had already calmed down. But in fact, it just appeared to have calmed down. Victims could not speak up because the whole Minamata city was dominated by the polluting company. Threatened by the power of the company, even doctors diagnosed Minamata disease as kidney problem or cerebral haemorrhage. Diagnosis standards for Minamata disease were also affected by the politics. The standards worked to limit the number of officially-acknowledged victims.

Before Minamata disease spread, fish, birds, and cats showed the symptoms. This suggests that any disorder in ecosystem needs to be fixed in order to prevent the damage to human. The primal goal of environmental policies is the relief of victims. To solve the problem completely, however, all the elements in the polluted region need to be cured and revitalized. Some theories consider pollution and the global environment as different set of problems. As seen in Table 2, today's situation around environmental problems have become diversed. Each of them requires study and control of its own. But paying attention to the relations between them is important to understand the problem correctly as well.

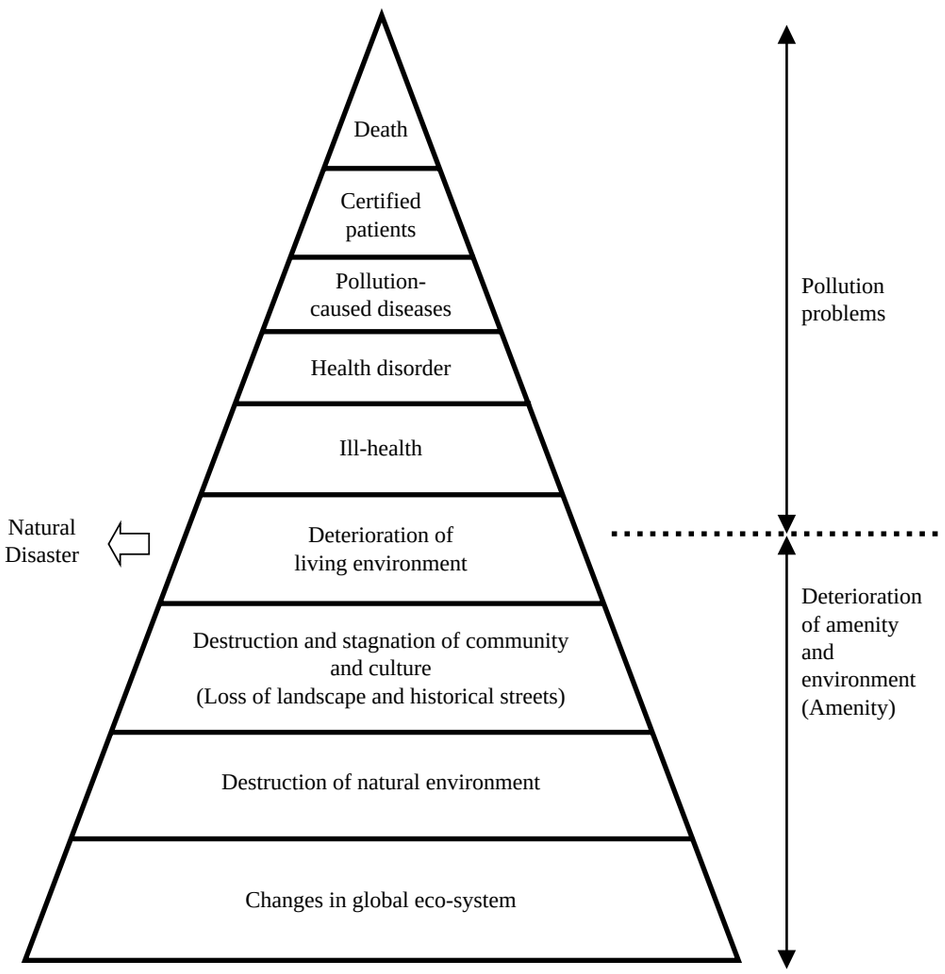

Figure 3. Pyramid of Environmental Problems

Table 2. Genres of Environmental Problems

	Residential area (L)	National land (N)	International scale (I)	Global scale (G)
Pollution (p) Deteriorating	Lp	Np	Ip	Gp
Environmental Quality (q)	Lq	Nq	Iq	Gq
Destruction of Ecosystem (e)	Le	Ne	Ie	Ge

B. Social Characteristics of the Damages

Damages caused by pollution have three social characteristics:

a. The Physically Weak

First characteristic: damage spreads from those who are weak biologically. As seen in the case of Minamata disease, the process of pollution starts with the injury and death of vegetation and animals which are more sensitive to pollution. As for humans, those who have less power of resistance to disease-people who are ill, elders, and young children-lose their health first.

Out of 98,694 officially-acknowledged victims of air pollution at the time of 1987, 33.9 percent was the children under four years of age. 28.5 percent was the elderly people over 60 years old. These two kinds of people take up 62.4 percent of the total. Among the people in productive ages (from 20 to 60 years old), percentage of housewives is high. There are more women than men. It was same in the case of Minamata disease. Young children and elder generation were affected heavily by the pollution. The majority of acknowledged Itai-Itai disease victims were the middle-aged women who had been pregnant. They got the disease when they were pregnant, which was a vulnerable state for human being.

Because victims are mostly those who are sick, aged, or very young, their being ill does not have apparent impact on the economic functions of society. This is another reason why the counteraction against pollution was not taken soon enough. People in these “weak” categories are not employed. Hence, their sickness does not affect companies or GDP. (As a matter of fact, it will increase the amount of medical expenditure and contribute to the growth of GDP.) Hence, no counteraction gets taken even when the pollution spreads and damages the people’s life severely. Only the sense of social justice to protect human rights can make the pollution recognized socially and starts the process of controlling it.

b. The Socially Weak

Second characteristic: Damage falls onto socially-weak people. Those who have money can life a good life in a good environment. People with less money, however, have no choice but living in a bad environment, houses and eat food with lower quality. For example, among 2,334 executives of big companies in Osaka, only 157(6.7 percent) live in Osaka city. The rest live in the expensive residential areas such as Nishinomiya and Ashiya. The same phenomena can be found in other countries.

In "Growth: the price we pay", E.J.Mishan, a British economist, studied the construction of highways in last 10 years. He states that the victims of car pollution are always the working class and the lower middle class.

We discovered a case of mercury poisoning among native Canadians. In this case, the Leed Company, an international enterprise damaged the life of a minority group – native Canadians. It is reported that many victims of air pollution are the people of minority group who have small incomes.

c. Absolute Irreversible Loss

Third characteristic: Environmental problems, of which pollution problems is typical, differ from other economic losses in that they include absolute irreversible losses that cannot be subsequently compensated. If damage is acknowledged judicially or administratively, human health and life are compensated on the basis of earning potential. While it stands to reason that the offender should compensate, it will not bring back the victim's health or life because it is often difficult to heal pollution-caused illnesses. Those damages are:

1. Loss of health and the life of human beings.
2. Destruction of ecosystem which is necessary for human to live
3. Destruction of landscape and cultural heritages or assets.

Because it is insufficient to compensate such losses after they occur, the actions that cause them must be stopped or prevented. If compensation or other redress provided after an absolute loss caused by development does not affect recovery, an environmental assessment or other comprehensive assessment of project plans, whether public or private, must be performed in advance to prevent the occurrence of losses.

In Japan, victims of pollution receive compensation as provided in the Basic Law of Health Damage caused by Pollution. Table 3 shows that comparative costs on the amount of the compensation and assumed cost companies would spend to prevent pollution, calculated by the ministry of environment. Although there are some problematic elements in it, this clearly shows if a company takes actions to prevent pollution early enough, they can not only avoid the pollution to occur, but can also save themselves some money. It is needless to say, compensation does not bring back the life and health of victims. The comparison made in the above table serves its purpose to make the companies to recognize the need to prevent pollution, but fails to provide the answer to pollution control. Once the environmental problem occurs, it can cause ultimate damages. When planning a business-both public and private-an advance research, such as environmental assessment, needs to be done to prevent pollution.

What was experienced through the cases of pollution in Japan can be utilized to fight against the pollution in developing countries. International companies are often the cause of pollution in developing countries. It is usually very difficult to figure out the entire picture of damages and spot who exactly is responsible, because the governments protect and encourage the international companies to come and operate the business. Suppose victims succeeded to prove the company was responsible for the damage, the amount of compensation gets set according to the income level of the hosting country, and not the income level of the country the company come from. The case in Bhopal, India, which caused the worst industrial disaster in history is a very good example. It has not resolved yet.

Such those global environmental issues are a common problem to be solved for all the human beings. But the damage will differ according to time, location and social classes. As noted in this chapter, pollution reflects social inequity. The first victims of global warming should be those who are low-income people, especially youth, elders, and the disabled, in the coast area or island. In addition, if the climate changes cause the rise of sea level, then our ecosystem will lose its balance and will not be able to be regenerated anymore.

Table 3. Failure Examples of Predictions of Pollution (Risk).

(million yen)

	Annual amount of damage	Annual costs of measures
Minamata disease	12,631	123
Itai-itai disease	2,518	602
Air Pollution in Yokkaichi Complex	1,331 (21,070)	14,795

Source: Association of the Study of Global Environmental Economics, "Japanese Experiences in Pollution", Godo shuppan, 1991

(1) 1989's prices
(2) The amount of the damage to people is the amount of the compensation by the Basic Law of Health Damage.
(3) If no measures were taken, the amount of damage of Air Pollution in Yokkaichi Complex would be the amount in round brackets.

C. Environmental Policy as Hybrid-policy.

Under the system of market economy, individual is responsible for his own being. Hence, environmental policy does not get developed automatically. It gets created by public opinion, movements, the scientific progress or the regulation by law.

Followings are the three means of implementing environmental policy:

1. Direct Regulations: Legislation, judicial and public administration formulate the standards on the law. The government should regulate with punishment or penalty or call administrative direction.

2. Economic Instruments:

a. Subsidy:

Measures taken to reduce the cost burden of environmental preservation by the preservation of financial assistance. These include funding, financial investment and loans, tax reductions and tax exemptions.

b. Imposition of surcharges:

Measures taken to get the cost burden of environmental preservation and recovery based on PPP (polluter pays principle). The "Pollution Related Health Injuries Compensation Law" in Japan and the Super Fund in U.S are widely known examples.

c. Environmental taxes:

It is hard to apply PPP onto these taxes. However, they produce general revenue for environmental preservation and restriction of the consumption of polluting materials, i.e. Carbon Tax, Energy Tax.

d. Emission rights trading:

Business entities who have succeeded to meet the regulation standards for emission can sell its emission rights to other businesses. Emission rights exchange market is now operating in the U.K.

3. Self Regulation / Promoting the Policy through Environmental Education

In Japan, people's opinion and movements have created the progress in the environmental policy. Citizens work together to recycle and separate wastes. Corporations started to introduce the measurement towards environmental regulations, such as "ISO14000 Series".

Among these three means, Economic Measures are considered effective, because they work well with the market system. With Direct Regulation, it is hard to know how effective the regulation is. Moreover, people tend to feel negative about the law enforcement.

However, the regulation by political and judicial administrations has been effective in Japan, especially in the case like Minamata disease, which created serious damage. Also with, air pollution by sulfurous acid gas, strict environmental standards and surcharge took care of the problem in short period of time. Hybrid Policy – utilizing both strict direct regulation and financial means together – seems to work effectively.

TO ACHIEVE THE SUSTAINABLE SOCIETY

1. From "End of Pipe" to System Innovation

Environmental policy was developed in the latter half of 1970. Following that, the technology to prevent pollution made a drastic progress. As the result of serious cases of pollution, Japan developed the technology of pollutant treatment. Emission of sulfurous acid gas decreased dramatically during 1970s as shown in Figure 4. Technology advanced to prevent not only the air pollution but also the sewage and the noise. However, we have not made much progress solving environmental problems. For example, let's take a look at air pollution by automobiles. In 1978, technology to reduce NO_2 emission from automobiles was developed in Japan. Japan became the first in the world to meet the requirement of the Muskie Act. Because the Japanese car industry had been dependent on the American technology for long time, Japanese have been waiting for American car industry to come up with the solution for the Muskie Act. However, people's opinion forced the Japanese manufacturer to develop the technology on their own. Reducing the NO_2 emission increases the cost for fuel. Japanese car industry came up with the technology to solve this problem of the cost, too. As the result of all these technological development, the quality of Japanese cars became high. Japanese automobile industry succeeded to prevent the pollution. Moreover, Japanese cars have attained the best quality in the world. The production of them grew, beating that of the American automobiles. In the words of the president of Nissan, this situation had reaped "good from evil." This is of course an important lesson. However, the amount of NO_2 has been still increasing (Figure 5). It is because the main means of transportation have shifted from railway to automobile (Figure 6). The traffic increased especially in the metropolitan area and it caused the amount of NO_2 and SPM to rise. Increased amount of traffic caused traffic jams. The government spent more than one-fourth

of public investment on road construction. But well-organized streets bring in more cars which cause traffic jams again. In this vicious circle of traffic jams and construction of roads, pollution grew bigger and made people ill. Victims are still fighting in the court for the relief.

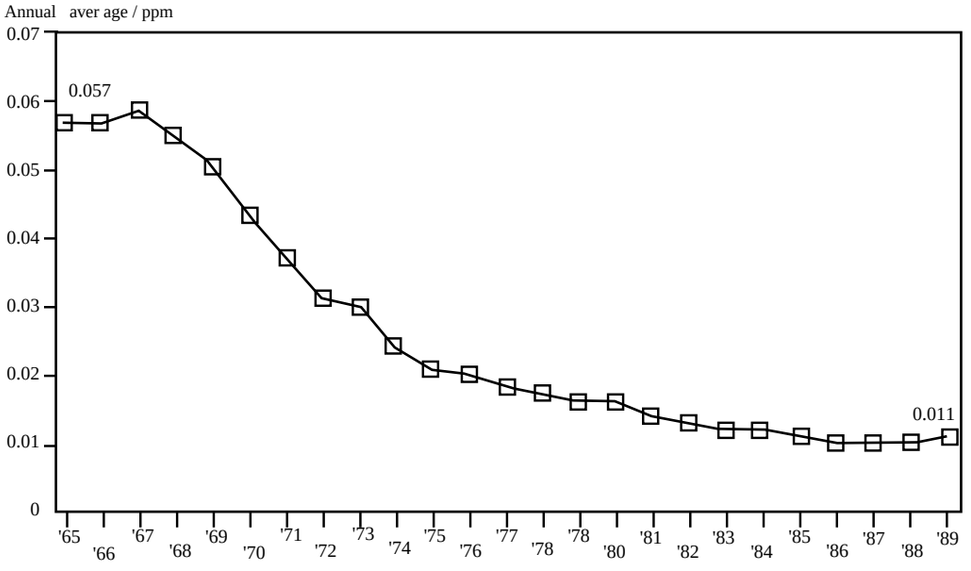

Figure 4. Changes in Annual Concentration of SO_2
(Average of 15 air-pollution monitoring stations in continuous operation)

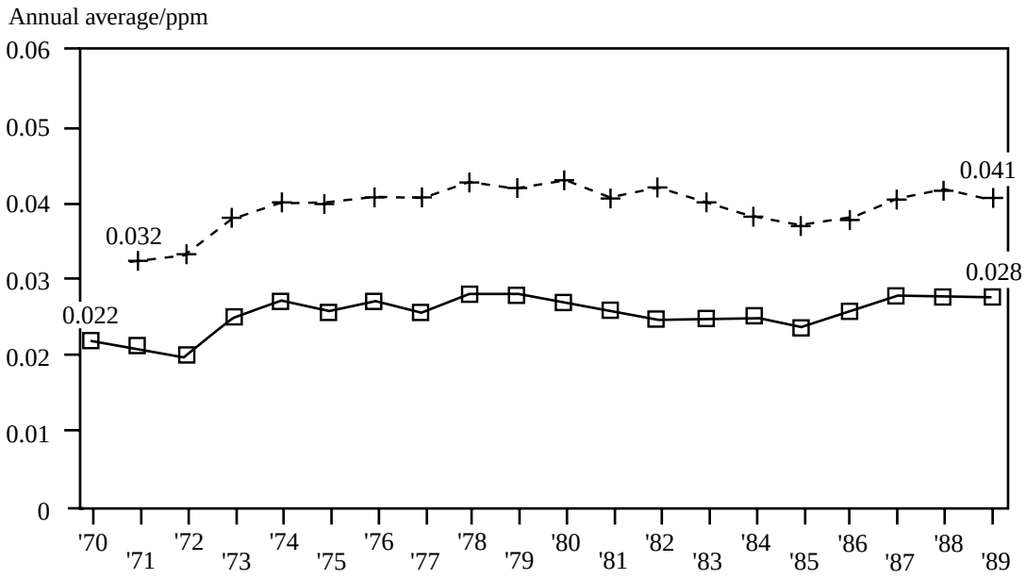

Figure 5. Changes in Annual Concentration of No_2
(Average of 15 air-pollution monitoring stations in continuous operation ▪▪▪ □)
(Average of 21 automobile-exhaust monitoring stations in continuous operation ▪▪▪ +)

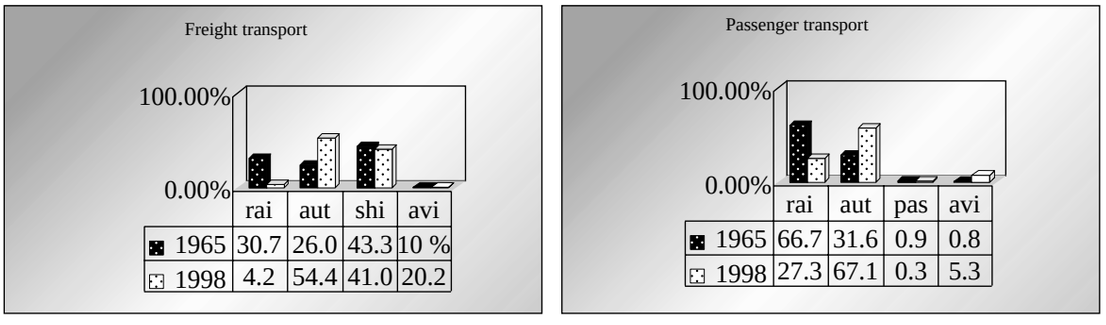

Figure 6. The Changes in the Volume of Domestic Transport
(Resource: "Japan National Data 2000-2001", Kokuseisha, 2000, p.407)

The policy which has been practised till today is called "End of Pipe." It is the policy to cut back and cleanse the pollutant at the last stage, where it is introduced to the environment. But it is no fundamental solution. Socio-economic system needs to be changed to solve the environmental problems. Following is the outline of the change.

a. Abandoning the system of mass production, mass transportation, and mass consumption. Instead, a society can adopt a new system which conserves natural resources. For example, cutting back the number of road construction and increasing public projects related to welfare, medical treatment, and education. This change does not affect the economy to slow down (Table 4).

b. Shifting the structure of industry from heavy chemical industry to information and high added-value industry.

c. Breaking up the population concentrated in big cities into smaller local cities.

d. Changing the traffic system in cities from automobiles to public transportation.

e. Abandoning the American life style of consumerism, and starting the lifestyle that fits better to the regional characteristics.

f. Encouraging recycling of the waste and quit the system of "discard, burn and bury"

For example, after the World War II in Japan, old buildings got simply demolished to build a brand-new building. It is environmentally wiser to use the old buildings again as Europeans do to preserve the cityscape.

Table 4. Economic Effects on Social Security, Medical Treatment and Health, and Public Works

4-(1) Effects of Production (in case of the investment of one trillion yen)

(hundred million yen)

	First Effect	Second Effect	Third Effect	Total
Social security	15,162	9,134	2,868	27,164
Medical treatment and Health	18,012	7,119	2,242	27,373
Public works	19,960	6,213	1,918	28,091

4-(2) Effects of Employment (in case of the investment of one trillion yen)

(one person)

Social security	291,581
Medical treatment and Health	225,144
Public works	206,710

4-(3) Gross Added Value (GDP Effects) (in case of the investment of one trillion yen)

(hundred million yen)

	First Inducement	Second Inducement	Third Inducement	Total
Social security	9,675	5,132	1,609	16,416
Medical treatment and Health	9,405	4,003	1,261	14,669
Public works	9,134	3,491	1,096	13,721

Source: research papers made by specialists of governmental institution

* The amount that the consumer spending not provided for in the family budget is deducted from gross added value is approximately equal to GDP

These require fundamental changes in the current system of economy and politics, under which industrialization and urbanization took place.

Then a question comes up: "What kind of new society do we want if we want a different society from the modern one we have now?"

At the Stockholm conference in 1972, the concept of "the limit of growth" has already been mentioned. However, it was not able to come to a unified conclusion due to differences in viewpoint between North and South nations. Then it became more apparent that the environment of this planet was in serious danger. The Rio conference in 1992 set the common goal of human as the sustainable development – which is to balance the environment and development. However, it was still not clear what kind of society Sustainable Development is aiming for. Until now people have been discussing on this issue in and out of Japan. I have defined the following 5 principles.

1. Maintaining peace, and particularly the prevention of nuclear war
2. Conserve and renew the environment and resources, and maintain and better the Earth as a place for the ecosystem, including human beings
3. Overcome absolute poverty and eliminate social and economic injustice
4. Achieve basic human rights and freedom of thought and expression
5. Firmly establish democracy

A society which satisfies these 5 principles is a "Sustainable Society". The most difficult to achieve among these principles are the ones concerned about the economic growth, peace and conservation of environment.

In 1966, K.E. Boulding wrote in his book, "The economic of knowledge and the knowledge of economics", "Only crazy people and economists believe the limitless growth." Japanese politicians also think that Japanese economy grows with no limit. Not all the economists believe in it. In 1848, J.S.Mill, the master economist of classic political economy, wrote "Of the Stationally State", the Chapter 6 of "Principle of Political Economy." In this chapter, he states that the wealth does not increase unlimitedly, and that the stationally state comes after an economic growth. He predicted the globalization of the capital and production technology would inevitably cause the stational state. Mill says that economic growth does not necessarily bring happiness, because it creates war and the destruction of nature. According to Mill, the stational state does not mean progress has stopped. Economy might be in a stational state, but humanities, such as culture and morals, can still grow.

The average income of a Japanese is now $30,000. However, the quality of life has not got ten times better than the time when the income was $3,000. 1 percent decline of the rate of economic growth or the tripled rate of unemployment seems to make people much more concerned.

J.Birkland wrote, in "Design of Sustainability" (2002), that despite Australian economy grew 3.2 percent yearly in 1980s, poverty spread – the rate of unemployment doubled and the foreign loan increased 10 times. The author states that GDP does not reflect the quality of life, and that alternative ways of life is in need.

The market economy automatically enhances the economic growth. The slow growth means the low rate of investment – this creates unemployment and decreases profit. To avoid it, economy must grow. Unequal income is the pretext of market economy which stands on the principle of competition. To maintain the system of inequity, economy needs to keep growing and increase the income of the poors. Under the situation of low economic growth, people have to fight to win his share of the pie. This leads to a crisis of market economy. This is why coming up with the policy for economic growth is the primal job for the government and the nation.

Human beings created two fundamental principles: freedom and planning. It is apparent that a sustainable society can not be attained only with the principle of new liberalism, which is spreading the market economy all over the world.

On the other hand, the planned economy, which was seen in the former U.S.S.R and the eastern European countries limits the democracy and freedom. Therefore it would be essential to mix the two principles. How do we plan the economy democratically with the foundation of market economy system?

2. From Labor to Work / From Demand to Needs

To create a sustainable society, current style of work and demands need to change. Japanese political economist Shigeto Toru asserts in his work "The political economy of the environment (1999)", the need to grow out of GNP priority doctrine. He says it can be done by transforming the Labor (something to earn money) into Work (something one does for his own goal or to produce beauty). E.V. von Weizsaker, a German environmentalist, proposes in his "Erdpolitic", the environmental policy that utilizes market system, such as Environmental Tax and Energy Price. He also proposes shifting the labor (Arbeit) to self-motivated, voluntary work (Eigenwerk).

In fact, in the developed capitalistic countries, more people engage themselves in voluntary work, such as the work for NPOs and NGOs. The idea of changing labor is no longer a dream but now becoming real.

At the same time, some theory claims that the style of consumption and demands are changing. Sosuke Mita – Japanese sociologist – wrote "Theory of Contemporary Society" (1996). In this book, he says that the lifestyle of consuming mass-produced commercial merchandise will end. He says people look more for information, culture, and the experience which is out of the commercial system- for example the beauty of dawn. Based on Mita's theory, there will be more people like this. More people will desire the Sustainable Society, instead of keeping GNP high.

3. From Exogenous Development to Endogenous Development

In "Hind Swaraj" (1909), M.K. Gandhi stated his vision of the independent India. Following is the outline of his idea. The prosperity of Great Britain was made possible by the colonization of half of the world. If India was to follow such experiences for its prosperity, it would require so many earths. Big cities produce gangsters and prostitutes. There, the poor gets exploited by the rich. Hence, Gandhi thought the ideal form of independent India was to be the collection of self-supporting small villages. Gandhi himself practised the lifestyle of self-support. The image of Gandhi with spinning wheel is all too famous.

Unfortunately, his vision did not get realized. Today, the developing countries (including China) are getting developed economically by the international corporations to adopt the lifestyle of mass-production and consumerism. When a developing country let the international companies and ODA develop the region, it is called Exogenous Development.

This style of development simply copies the western style of modernization. Developing countries lose not only their original culture, but also the healthy environment and natural resource. Even in Japan, this Exogenous Development caused the concentration to the big cities, centralization of economy and damages in small cities and farming villages. Therefore, the alternative way called Endogenous Development has been getting attention since 1980s.

A. Endogenous Development is not a means of the GNP growth. It is concerned about the total development of environment, welfare, education, and culture. Exogenous Development creates big destruction of environment. On the other hand, Endogenous Development preserves environment.

B. Endogenous Development does not require the capitals of large cities or the development project by the central government. The way of Endogenous Development is to make stronger networks between local industries and produce high value added there. Under Exogenous Development, profits and taxes are brought back to the big cities. Moreover, the political benefits are attributed to the central government or to the political parties. The more such a development takes place, the more profits go to the metropolitan area. Another thing is, when those foreign enterprises find out they can not gain profits in the region due to the change of industrial structure, they leave the place. For example, the heavy chemical industry complex built in the 1960s had quit their operation because the regions with those complexes are no longer alive. On the other hand, under Endogenous Development, social surplus (profits, levies, and consumer surplus) in the region are redistributed to social welfare, education and culture.

C. In the case of Exogenous Development, the main actors are big famous companies, central government, the local capitals and the local government. While, in the case of Endogenous Development, the main actors are the local enterprises, autonomies, and NPOs and NGOs. As development proceeds, Exogenous Development makes the region more dependent on the central powers. On the other hand, the latter helps growing the autonomy of the local government. Figure 7 clearly shows that Exogenous Development gives us the unsuccessful facts.

Exogenous Development in developing countries foster the “Master-Slave” relation between the countries. There are possibilities that such a development would foster the economic problems but also lost the cultural diversity of the world. It is anachronistic to practise Gandhi’s ideas today. However, this should be the first step to create a Sustainable Society by shifting from Exogenous to Endogenous Development.

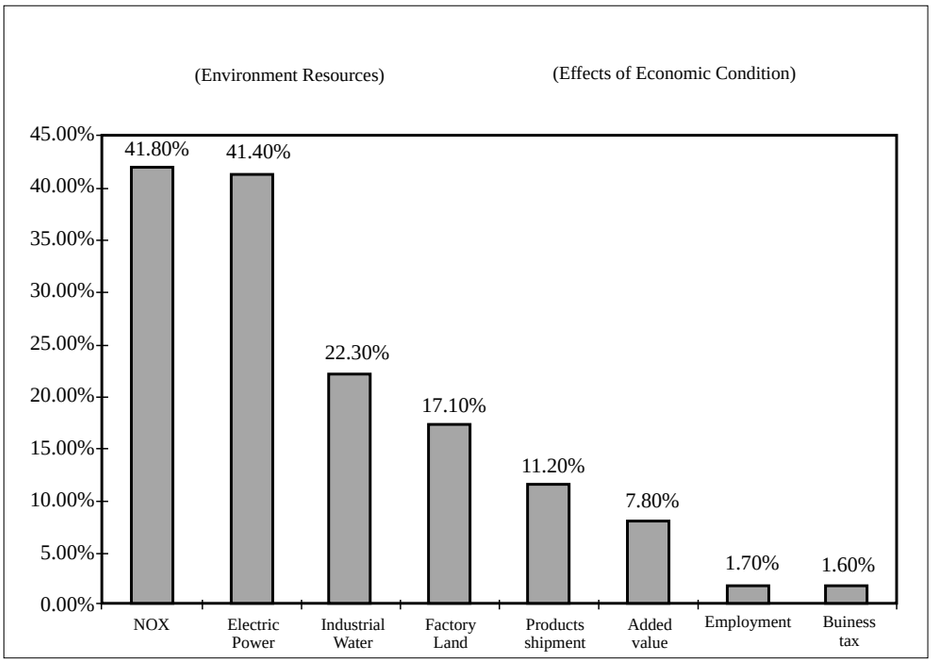

Figure 7. The Share of Sakai-Senboku Industrial Complex in the Whole Industry in Osaka Prefecture

CREATING SUSTAINABLE SOCIETY FROM WHERE ONE STANDS ON

The U.S. started the war against Iraq. It broke the hope for the global peace and caused crises in the world order the U.N. holds. The Bush administration did not ratify the Kyoto protocol and going its own way to keep the mass consuming American style of life. The global environmental control is operating under a difficult condition. It seems Sustainable Society will never be achieved under such circumstances. However, there is no choice but developing the Sustainable Society if we want to save the earth. A lot can be learned from E.U.'s regional policy after 1980s.

1. Sustainable City (Community) of E.U.

E.U. announced the "Local Self-Government Charter of Europe" in 1985. The following year, member countries ratified it and the charter came into effect. The charter gave many functions of a nation to the local self-government. Having this reform as the foundation, in 1993 and 1996, the Sustainable City Program was announced as the local policy. Followings are the four main themes of the policy:

1. Sustainable management of natural resources:

By using natural energy, and by recycling within the city, we can create a society which does not waste any natural resource.

2. Reformation of the social system and the economy of the city:

We can develop environmental businesses, using the financial means such as public regulations and the environment tax. Environmental businesses will increase the employment.

3. Policy for sustainable transportation:

Suppressing car transportation and replacing the system of public transportation. The total volume of transportation can be decreased by planning the city, in which homes and the work places are close.

4. Spatial planning:

By keeping residential zones in metropolitan area, over-concentration of economic functions can be avoided. This also limits the development of suburbia and protects the nature and farmland.

This kind of revolutionary proposal has been already in practice in cities across Europe. Strasbourg in France, Ravenna and Bologna in Italy are the well-known examples. One notable case is the Freiburg in Germany. Former French army base has been transformed into an eco city. There is a reclaimed land of 60,000ha on a delta of the Poe river in Emilia-Romagna, Italy. The "Parco Project" is the attempt to turn this reclaimed land back into a swamp and the ocean.

2. Environmental Regeneration in Japan

The New York Times once called Japan a "construction state." The percentage of public investment in GDP of Japan was 2 to 4 times higher (6 to 8 percent of GDP) than that of other capitalist countries. As a result, development projects by public sectors fostered the natural destruction in Japan. Since 1970, many lawsuits were brought about to stop the pollution from the development. Recently, the national financial crisis made it difficult for the government to invest in such development projects. Thus, the reformation of public investments got started. Projects, such as the land reclamation at Lake Shinji and the construction of Asakawa-Shimosuwa dam were suspended.

When the lawsuit of Nishi-Yodogawa pollution came to reconciliation in 1995, the plaintiff asked the polluter to establish an enterprise which would make the polluted area safe and healthy. 15 billion yen was taken out of the compensation to establish the enterprise. The victims started "Aozora Foundation", an NPO to regenerate the environment.

This noble action of spending the compensation for public purpose affected people profoundly and deeply. Victims of other cases of pollution, such as Kawasaki, Mizushima, Amagasaki, and Nagoya won their lawsuits. They, too, have set up the enterprise to regenerate environment, using their compensation.

As for the regeneration of nature, Lake Biwa in Shiga prefecture starts to be cleaned by the project in which the lake should be restored and back from the reclaimed land. Also, the Eco Co-Op of Shiga Prefecture has been growing the rape plant on the farm land which is not in use due to the restricted rice production. The oil extracted from the plant gets recycled completely. First, it is used as frying oil in school cafeterias. Then it becomes the fuel for automobiles and tractors. This "Rape plant Eco Project" originated in Shiga prefecture and is now spreading throughout the nation (Figure 8). People are just starting the movement to protect the environment from the very local level.

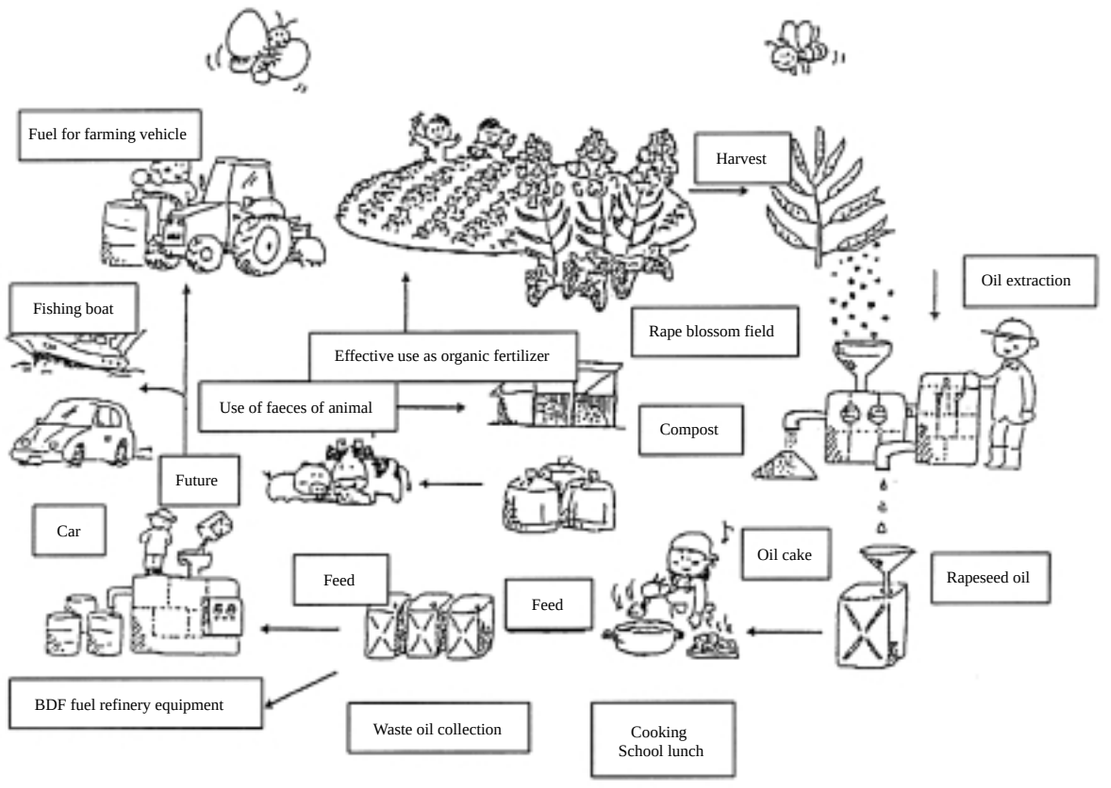

Figure 8. The Circulation of Rape blossom's resources (Example)

We still face many obstacles for the preservation of our global environment. However, there are some hopes in the future. When I organized a Pollution Study Committee in 1963 – the first interdisciplinary-studying group in Japan - there were only seven members. The situation was similar in other countries. At that time, we received heavy pressure from companies and the government to intervene or stop our study on pollution. For example, a knife was mailed to my office with no sender's name because this happened after I testified at the Yokkaichi Pollution trial as the first scientist. However, within less than ten years, people recognize that our studying was right. Today, everyone speaks out preserving environment without hesitation. Either in the case of the academic association, the environmental studies have grown, so it's in fashion to study environment today. Environmental Economics and Policy association now have more than 1,000 members, and more than 10 people are joining every year. It is almost like a dream when I remind myself that there were only three economists in the Pollution Study Committee. When I think of all of those, I believe that the future will be brighter, despite the current depressive situation of international politics.