Environmental Issues and Protection: from the past to the future

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Environmental Issues and Protection

- from the past to the future -

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1 . Environmental issues in Japan

In Japan, environmental issues in Japan were first recognized when outbreaks of pollution related illnesses occurred, which included mineral pollution in the 1878 case of the copper-mine in Mt. Ashio, the itai-itai disease in the Jintsu river basin in 1922, organic mercury poisoning in Minamata Bay in 1953, and the outbreak of air pollution related asthma in Yokkaichi in 1956. Following these events, pollution related affairs were put under the administration of the Ministry of Health and Welfare Japan in 1964. Environmental issues have been categorized into 4 classes (Table 1).

Table 1 The 4 categories of environmental issues

	the source of outbreak	example
Level 1	Industry	Organic mercury poisoning in Minamata, *itai-itai disease, photochemical smog, global* warming
Level 2	Toxic chemicals	Environmental pollution by synthesis of chemical substances such as PCB, DDT.
Level 3	Eutrophication of lake	Overpopulation, unattended water from city, etc.
Level 4	Unintentional emissions of chemical substances	Ozone destroyed by freon, and emmision of dioxin

After 1965, in Japan, establishment of a series of laws concerning environmental pollution and efforts by companies could reduce these environmental pollution at levels 1 and 2. The time to start taking measures to prevent pollution greatly depends on countries: some countries started earlier than Japan, but some others have not responded

yet. In Japan, the density of sulfur oxide in the air, represented by sulfur dioxide, has decreased yearly by means of the introduction of cleaning technologies, low-energy devices, improved fuels and desulfurization methods among others. The current density levels are only 1/5 compared to peak values in 1967.

However, the levels of carbon dioxide have remained almost constant for the past 20 years, which mainly depends on exhaust gasses from cars. The ratio of emission by moving sources (cars etc.) compared to fixed sources has shifted from 30% to 70% in Tokyo, and is a general trend in big cities.

Natural resources on earth are limited. Especially, these resources are scarce in our country. Recycling, waste processing as well as reducing carbon dioxide emissions is important, but one should also think about methods for producing resources. In this respect, Japanese environmental protection is directly related to global environmental protection.

2. Global environmental issues

The industrial revolution lead to rapid development of industries which eventually has made the life of mankind more comfortable. However, our civilization based on fossil fuels has reached a big turning point. I would like to present some data that describes the changes caused by the industrial revolution. In the arctic island of Spitzbergen (located north of Scandinavia and belonging to Norway) the ice core has been sampled and among others, the pH has been analyzed. (OHP) The data shows that the pH was about 5.2 before the industrial revolution, but the ice has become gradually more acid throughout the 19th and 20th century.

A pH value of 5.5 is equal to that of rainwater when the air contains 330 ppm of carbon dioxide.

The significance of global summits becomes very important because pollution is an "international" borderless issue, which is especially true for air pollution. Therefore each country has to cooperate in keeping global environment.

At present, important issues in respect to borderless environmental issues are as follows;

Acid rain and snow.	**Global warming.**
Forest destruction.	**Desertification.**
Fresh and sea water pollution.	**Destruction of ozone layer.**

These issues are related each other. Namely, they are interconnected by a variety of chemical processes.

It is believed that carbon dioxide is one of major causes of global warming. There is a country, the Maldives, situated some 640 km south of Sri Lanka in the Indian ocean. It is constituted of about 1800 small coral reef islands, covering an area of 289 km2 and having a population of 140000. The highest spot is only 3 m above sea level, and 80% of total land of this country is below 1m a.s.l.. If global warming would continue, such lowlands will sink, and other serious consequences could follow such as a rise in salt levels in underground water reserves. Changes in ecosystems would be disastrous to coral reefs and fish and so on.

3. International cooperation in environmental issues

The Helsinki declaration of May 1989 calls for an abolishment of ozone-destroying freon products by the year 2000. It also calls for a contribution of each country to develop and promote the substitutes and new technologies. The research has continued. Regulations of carbon dioxide emissions were instituted in November of 1989 in Nordvijk in the Netherlands. This declaration calls for a stabilization of carbon dioxide levels by the year 2000. This declaration was a historic step in putting a frame to the reduction of energy consumption. The conference held in Kyoto was well known for its treatment of these countermeasures.

Table 2 Atmospheric changes

☆Age of the earth : 4.6 billion years ago Birth of life : 3.8 billion years ago Primitive atmospheric : nitrogen, vapor, carbon monoxide, carbon dioxide (97%, 30 atm), hydrogen, methane, ammonia, etc. No separated oxygen.	★man(Homo sapiens.) Australopithecus use of tools A million years ago Homo erectus use of fire Half a million years ago Rich delta area acquisition of agricultural technology ten thousand years ago
☆Growth of oxygen (by photosynthesis) 2 billion years ago : 1/100 1.5 billion years ago : 1/10 0.4 billion years ago : 1/1 (21%)	

The history of mankind is only 1/1000 compared to the earth (Table 2). We are responsible for improving our global environment for future generations. The EMEA Project must contribute to these issues by international cooperation.