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TOWARDS SUSTAINABLE SOCIETY, GLOBAL SPACE AND TIME: A ROLE OF SOCIAL MOVEMENTS IN JAPAN

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Table of Contents

Chapter 1

Introduction

The advancement of industrialization has created a situation which may bring human beings towards extinction: nuclear wars and nuclear plant accidents are obvious examples. Such human actions possibly threaten human survival. Furthermore, environmental problems (i.e. global environmental problems: global warming, ozone depletion, tropical forest destruction, and so on) also begin to be recognized as the threat to human survival.

However, the above problems are only the tip of the iceberg of a host of threats to humanity. Furthermore these threats became diverse and complex along with the advancement of industrialization. For example, the creation of very many varieties of new materials (chemicals, radioactive substances, heavy metals, and so on) has resulted in the existence of stable toxic substances; they have diffused into 'nature' in huge volumes. As a result, they have steadily exposed the low-intensive toxicity to human beings. The accumulation of very many varieties of stable toxic substances is obviously a serious threat to human beings, however, it is difficult to verify the specific relationship between cause and effect due to the difficulty in sorting out the exact consequences of low-intensity and diverse stable toxic substances.

The lax attitude towards industrial pollution problems was a direct consequence of the power configuration in Japan (which is characterized by a close relationship between bureaucrats, politicians and the business sector). Such powerful formations do not easily agree with the evidence that industrialization may threaten human survival, and instead caste doubts on the evidence supporting such issues, which has the effect of prolonging and magnifying the problems.

There is also the difficulty involved in trying to solve even those problems which are within the grasp of the civil society. Most Japanese and other seem to be masked by the illusion of technological panaceas for solving environmental problems; and hence have accepted the current lifestyle and equate the present high level of consumption with affluent. Despite this apathy, civil society can and should play a vital role in moving towards an ecologically sustainable society.

1-1. Conceptual framework

The problems of threat to humanity indicated pertains to the explication of certain discernable conceptual frameworks which by necessity determines the interplay between such concepts as:

a) The sustainable society; the steady state of ecosystems;

Though there are various 'sustainabilities' in the ongoing discourses, I would like to focus on 'the circulation of matter' within a local ecosystem. Vegetation, excreta and animal corpses decompose forming soil nutrients which are further converted into vegetation. Each human society depends on the circulation of surplus matter within its local ecosystem, and within these natural limitations human societies are equally sustainable on Earth without compromising their future generations.

Furthermore, I argue that urban life in Japan, in which the majority of Japanese population line, is moving on the opposite direction; i.e. away from an ecologically sustainable society. Therefore this study focuses move on the initial steps to change the course of society towards sustainability instead of how that sustainability can be

operational.

b) Civil society;

Civil society comprises persons, households, and various civil organizations, such as social movements, non-governmental organizations, religious organizations, sports and cultural clubs, and so on. I would like to focus on the duality of the relationship between civil society and power holders which, in the Japanese societal context, is comprised of bureaucrats, politicians and the business sector.

And,

c) New social movements in Japan:

Social movements are defined as 'a form of collective action based on solidarity, carrying on conflict, breaking the limits of the system in which action occurs' (Melluci, 1985:795). New social movements, therefore, emerge from within civil society and are usually 'submerged in everyday life which require a personal involvement in experiencing and practising cultural innovation' (Melluci, 1985:800).

Since the early 1970s in the Japanese societal context, new social movements have emerged in the form of struggles by marginalized communities against pollution and development projects destructive to the environment and their health. These are movements based on ecological concerns, the transformation of everyday life, and the building of alternative systems (Muto, 1993:4).

1-2. Objectives and scope

Many Japanese, including myself, have strong views on local and/or global environmental problems. They have noticed there is something wrong with the current life-style. They are particularly worried about the excessive and inappropriate usage of materials and energy, including foods. Such practices do not only threaten their own survival but also threaten the survival of future generations. However, even if we cannot prove how the present lifestyle is unconducive to future well being, we should take action to influence and hence change the situation for the better.

There is no doubt that such views constitute the major motivation for participating in or creating certain types of new social movements. In japan these movements include the consumer movements, the organic farming movements, the milk pack recycling movement, the alternative cooperatives, and so on. However, it is also a reality that the advocates of such movements are still a minority within the civil society.

Therefore, the purpose of this research paper is: firstly, to describe and analyze the process of the transformation of the relationship between human activities and ecosystems (i.e. from a subsistence society to a complex industrialized society), and the environmental crisis in complex industrialization at this moment; secondly, based on the above, to discuss the possible strategies for solving the crisis, and the role of the civil society, particularly the role of new social movements in the civil society.

1-3. Hypothesis

People, nowadays, tend to look at environmental problems as external to themselves as if the problems do not threaten them. This notion is socially constructed by power relations and ideological masks. However, once people realize that environmental problems threaten their lives, they may be eager to transform their perspectives: internalize environmental problems, i.e. look at them as part of their life. This transition of perspective on environmental problems is crucial for changing our attitudes towards the environment.

1-4. Methodology and limitations

In this research paper the sustainability of 'nature' is analyzed within the large framework of a "steady state", a concept which is derived from the entropy law. The steady state of a system can only be maintained by the existence of its superstructural system for inputting low entropy resources and outputting entropy in the form of waste heat and matter; and the superstructural system itself also requires its further superstructural system for maintaining its steady state. Therefore, the steady state can only be maintained within a continuous linkage of steady states from a cell to Earth.

The concept of steady state and the entropy law application are the result of a detailed examination of the works of Tsuchida, a leading Japanese scientist on Entropy. Particularly, in his book, "**Shigen Butsurigaku Nyumon (Introduction of resource physics)**"(1982), which is broadly acknowledged among Japanese scholars as the fundamental text for applying the entropy law (i.e. a physical law) to the social sciences. In this sense the study examines the specificity of the Japanese society without detailing the general relevance

of the Japanese experience. This is not to argue that there are no similarities between the environmental wrongs of the industrialized societies, nor does this study claim that the Japanese society is either worse or better since such value judgements are external to the immediate concern of this paper.

1-5. Organization of the paper

This research paper is structured as follows. Chapter two describes the sustainability of 'nature' before human intervention. It introduces the concept of steady state and the entropy law. Chapter three analyzes societal transformation in accordance with the advancement of technologies. It examines the salient features of the Japanese experience. Chapter four examines the possibility of reversing the contemporary societal problems (i.e. the environmental threats to human survival) by outlining the alternative politics of new social movements. Chapter five concludes by elucidating the linkage between the preceding chapters.

Chapter 2

Sustainability: A notion of steady state in connection with entropy

To analyze the possibility of a sustainable society (i.e. the sustainability of a human society), it is necessary, first, to analyze the sustainability of 'nature' (i.e. ecosystems and Earth) before human intervention. Because, as far as global environmental problems are concerned, we cannot deal with the sustainability of a human society in isolation from that of 'nature'. I then analyze the consequence of human intervention on 'nature' and the ensuing environmental problems.

In 'nature', living organisms and their environments (i.e. from cells to Earth) maintain, more or less, the same characteristics during certain time periods, i.e. the so-called steady states. For example, a matured animal, after a certain age, maintains its weight without significant increase nor decrease. Therefore, there are very many levels of steady states from the steady state of a cell (e.g. short period of time) to that of Earth (e.g. very long period of time: billions years)(Tsuchida, 1982:127-132). Thus, it is obvious that, in this study, sustainability is synonymous with maintaining a steady state.

To analyze the steady states of 'nature', it is necessary to define two related concepts: energy and entropy.

2-1. The laws of thermodynamics: energy and entropy

Heat diffuses into its surrounding until the ambient temperature stabilities

(i.e. from a hotter state to a colder state); matter diffuses into its surrounding (i.e. from a concentrated state to a diffused state). The laws of thermodynamics describe the above natural process in two ways. One is the law which contents that energy is always conserved, and only the form of energy change (the energy of the hotter state equals that of the colder state; the energy of concentrated matter equals that of the diffused matter). The other is entropy[1]. Entropy irreversibly increases according to diffusion (i.e. from the hotter state to the colder state, or from the concentrated state to the diffused state). The hotter state and the concentrated state are available to convert into work (i.e. human activities), while the colder state and the diffused state are very difficult to convert into work effectively. Therefore, the low entropy state (i.e. the hotter state and the concentrated state) refers to the condition conducive for work, while the high entropy state (i.e. the colder state and the diffused state) refers to the condition unconducive for work.

Tsuchida (1982) suggests that we should divide resources into two categories: one is low entropy resources, such as food, water, air, oil, coal, wood, motive power, and so on, which have the capacity to diffuse or to be diffused. The other is raw material resources, such as sunlight, iron ore, uranium ore, and other ores. Those are in high entropy states (Tsuchida, 1982:36-37, 42-46, 133-134). There is, however, the terminological difficulty

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[1]The major characteristics of the entropy are as follows.
The equation of entropy S is

$$S = Q/T,$$

where Q denotes physical energy, T denotes absolute temperature (i.e. Celsius temperature plus 273 degrees centigrade) (Tsuchida, 1982:202).

Entropy is the attribution of energy, heat and matters. Therefore, it is not possible to deal with entropy independently (Tsuchida, 1982:146).

The law of entropy is concerned with the behaviour of systems which contain a large number of particles (Tsuchida, 1982:27-30; cf. Faber et al., 1987:77).

The entropy defined here, should be distinguished from analogical entropies, such as the information entropy (Tsuchida, 1982:224-228; cf. Faber et al., 1987:97).

in Tsuchida's work that, although a sunlight is an energy resource in a high entropy state, it is defined as a raw material resource. Similarly, the fact that water and air are categorized as low entropy resources implies that the distinction between matter (e.g. raw material resources) and energy (e.g. energy resources) does not correspond to the distinction between low and high entropy states. Therefore, I propose that we clarify the situation and treat raw material resources as high entropy resources. On the other hand, waste[2] are in high entropy states, and can be categorized as either waste heat or waste matter.

Tsuchida analyzes the processes of producing goods in connection with rules of entropy. For example, he states that a production process of iron from iron ore is as follows. Iron ore is a high entropy resource. On the other hand, iron is in low entropy state. Therefore, iron ore never decomposes by itself into iron and oxygen as a natural process. Hence, it is necessary for iron production to remove entropy from iron ore; coal is used as a low entropy resource to remove the entropy in the form of waste heat and matter during the production process (Tsuchida, 1982:42-43).

In short, whether energy or a resource is conducive to human activities primarily depends on the state of entropy. If it is in low entropy state, it is conducive to human activities. On the other hand, if it is in high entropy state, other low entropy resources are required to remove the entropy in it, then it turn into condition conducive to human activities. Secondarily, it is implied that the conduciveness of matter/heat depends on the existing human technology.

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[2]It is noteworthy that 'resource' and 'waste' are relative terms, which are determined by technologies (Tsuchida, 1982:45-46).

2-2. Steady states of living organisms

A life supporting system of living organisms can be explained as follows. Animals, including human beings, input air, water and food in their bodies. They utilize the resources through programmed and specific metabolic pathways. And they output carbon dioxide, heat, sweat, excreta, and so on, into an external space (Tsuchida, 1982:143-148). It is empirically acknowledged that, if an animal is matured, after a certain age, and in healthy condition, the body maintains its steady state.

This can be explained in relation to energy. The amount of physical energy inputted almost equals the amount of total physical energy outputted as waste heat and matter (Tsuchida, 1982:62).

However, focusing on energy balance alone is insufficient and this steady state of living organisms can be also explained in relation to entropy. Firstly, an animal inputs low entropy resources, such as air, water and food in the body. Secondly, metabolism occurs within the animal body according to a programmed process. Nutrients and minerals are extracted and decomposed from food and diffused throughout the body, which creates the biochemical power to sustain continuous metabolism and the individual's activities. At the same time, metabolism is programmed to discharge entropy which occurs in the process and originally exists in food in the form of waste heat and matter. Thirdly, the body outputs the entropy, such as carbon dioxide, heat, sweat, excreta, and so on. Then, the discharge of the entropy creates further demand or capacity for inputting further resources for the body's metabolism and activities (Tsuchida, 1982:143-148).

The photosynthesis of plants can also be explained in connection with entropy. Plants input water as a low entropy resource, and carbon dioxide and

sunlight[3] as high entropy resources for their photosynthesis. They output entropy in the form of heat by transpiration. As a result, they produce low entropy products; dextrose and oxygen (Tsuchida 1982:167-168).

Examining Tsuchida's analysis above, I incline to interpret the role of bacteria and fungi as follows: they input water, the excreta of animals, the dead animals and plants, and oxygen, as low entropy resources, decompose into minerals and nutrients and output entropy in the forms of heat and carbon dioxide, or/and (if there is no oxygen) methane.

2-3. Steady states of local ecosystems

In the soil profile and on topsoil, it is generally acknowledged that plants, animals, and bacteria and fungi form complex natural cycles through ecological relationships. A simple view of such ecological relationships is as follows. Animals eat plants. Bacteria and fungi decompose dead animals and plants. Then, plants grow by absorbing nutrients and minerals which are produced by bacteria and fungi. As a result, the plants can, again, be consumed by animals.

The steady state of ecological relationships among plants, animals, and bacteria and fungi can be only maintained when the system opens to an external space, i.e. a superstructural system (Tsuchida, 1982:137-139). For example, a ecological system in the soil profile and on topsoil inputs water, i.e. rain and snowfall, as a low entropy resource and sunlight as a high entropy

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[3]Tsuchida emphasizes that sunlight is not 'clean energy' but the worst polluter on Earth: once sunlight is absorbed on the surface, the temperature of sunbeam immediately decreases from about 3,000 Kelvin degrees to ambient temperature; therefore, to use sunbeam as a resource, a low entropy resource is additionally needed to remove the entropy which is caused by the absorption of sunlight; for example, photosynthesis is only possible when the transpiration of water removes heat entropy (Tsuchida, 1982:133-134;167-168).

resource; the system outputs entropy in the form of waste heat into air by water evaporation and so on, and of waste matter by the release of gases, such as methane. Then, the steady state of a system can maintain the steady states of its subsystems, i.e. plants, animals, and bacteria and fungi (Tsuchida, 1982:137-139). It is also possible to analyze a system in and on lakes and seas in the same manner.

Furthermore, it is important to clarify the ecological relationship between the systems of lands, and of lakes and seas. Even when the matter cycle of land is 'complete', gravity gradually brings down nutrients and minerals, i.e. soil fertility, from land to sea, the agents of this movement being, for example, rainfall and the flow of streams or rivers. The reversible movement of nutrients and minerals, i.e. from sea to land, is done by anadromous and catadromous fish, such as salmons and eels, and by birds which catch fish from the sea and consume vegetation and animals on plain, and bring them to higher places (Murota and Tsuchida, 1989:151-152; Tsuchida, 1992:35-36). For instance, if the matter cycle is river-based, such a local ecosystem can be defined as a water system, or a watershed, which forms links from mountains through plains to a coastal sea by means of a river.

2-4. Steady state of Earth

Earth, the superstructure of local ecosystems, has been able to maintain its steady state for centuries. This is because Earth is open to outer space: it inputs sunlight as a resource, while it outputs entropy.

Tsuchida analyzes the steady state of Earth as follows. The gravity of Earth is strong. Therefore, it is rare for matter on Earth, except helium and hydrogen gases, to output into outer space. On the other hand, radiation is

seldom affected by gravity. Therefore, Earth can output entropy in the form of thermal rays, i.e. infrared rays. Thus, the steady state of Earth totally depends on this mechanism (Tsuchida, 1982:160). He analyzes the mechanism of outputting entropy from Earth. The evaporation of water in ambient temperatures removes entropy in the form of heat on the surface. Gaseous water rises about 5km above the surface where the temperature is about minus 23 degrees Celsius. Thus, gaseous water turns into water or ice, which causes the vibration of water molecules and outputs entropy into outer space in the form of infrared rays (Tsuchida, 1982:162-164).

To recapitulate, the steady state of Earth can be characterized as follows. Earth inputs sunlight as a high entropy resource. Earth outputs entropy in the form of infrared rays. This entropy is more than the entropy inputted by sunlight. As a result, the difference of entropy assures the continuation of all steady states on Earth at all levels, from atmospheric phenomena, local ecosystems, animals, to the cells of animals, bacteria, etc.

2-5. Linkage of steady states: From a cell to Earth

Tsuchida also notes that the steady state of a system is only maintained under these conditions which secures inputting resources and outputting entropy via waste heat and matter. Therefore, a system can maintain its steady state within its surrounding superstructural system (Tsuchida, 1982:138).

The above analysis inform this study that the steady state of a cell of an animal is sustainable within its organ as determined by its body, its local ecosystem, and Earth. In other words, the steady state of a system can only be maintained when the system opens to a superstructural system for exchanging low entropy resources and entropy. Furthermore, the superstructural system is

also required to maintain its own steady state. Thus, the open interaction between a system and its superstructural system is by analogy applicable to larger systems from a cell to Earth.

2-6. Death of a steady state: An analogy with a wine bottle

I have elaborated the necessary conditions for the maintenance of steady states at several levels and their linkage (using Tsuchida's analyses) based on entropy. It is also important to know the death of a steady state.

Tsuchida also analyzes the death of a steady state by using the following analogy with wine brewing: grape juice and yeast are put together in a bottle which is closed by a cover for insulating oxygen. The yeast input sugar from the grape juice; they output alcohol, carbon dioxide and heat. During this process, they also reproduce rapidly by cell division, increasing the rate of both consumption and production. The process will, however, be terminated within two weeks by the death or dormancy of the yeast. There are two possible reasons of the termination. One is that, if the original sugar content of the grape juice is less than twenty percent, all sugar is consumed by the yeast. In this case the reason for the termination is the lack of resources, i.e. sugar. The other is that, if the sugar content is more than twenty percent, which means that there is the plenty of the resource for the yeast, the yeast will also die or become dormant due to the high alcohol content. Therefore, the reason for their termination is the excessive waste, i.e. alcohol (Tsuchida, 1982:148-149).

The wine bottle, as a system, is closed to its superstructural system, e.g. the air in the wine cellar, in terms of sugar and alcohol. It is, however, open to the superstructural system in terms of carbon dioxide and

heat. Therefore, Tsuchida concludes that, if a system is intrinsically closed to a superstructural system, it is impossible to maintain it in a steady state (Tsuchida, 1982:149-150). The analogy clearly demonstrates that the assimilation of waste is equally important to the acquisition of energy and resources for sustaining a steady state.

Therefore, a sustainability (i.e. a steady state) can be maintained by the flow of entropy that a system inputs low entropy resources and output entropy which occurs in the system. As a result, a system sustains low entropy state. The accumulation of entropy in a system (i.e. high entropy state) means that the system faces the problem of the death of steady state.

Chapter 3

Transformation of Japanese Society:

From Subsistence to Complex industrialized society

Human beings have changed their relationship with ecosystems according to the advancement of technologies. Shiva describes the change by the comparison of two types of economies, which can also be interpreted as two different points of time in the advancement of technologies (i.e. at the beginning and at this moment):

> Traditional economies based on principles of providing sustenance with a stable ecology have shared with industrially advanced affluent economies the ability to utilize nature to satisfy basic vital needs of food, clothing and shelter. The former differ from the latter in two essential ways. First, the same needs are satisfied in industrial society through longer technological chains requiring higher energy and resource inputs and higher creation of waste and pollution, while excluding large numbers of people without purchasing power and access to means of sustenance. Second, affluence and overproduction generate new and artificial needs and create the impulse for over-consumption, which requires the increased exploitation of natural resources (Shiva, 1992:190).

Beck analyzes the result of the change as the 'risk society' which has emerged due to the creation of 'new risks', such as nuclear power, chemical and biotechnical production:

> The 'end of the Other', the end of all our carefully cultivated opportunities for distancing ourselves, is what we have become able to experience with the advent of nuclear and chemical contamination (Beck, 1992:109).

Merchant also describes the perspective of 'radical ecology' on the result of the change:

> Environmental problems ... result from contradictions (tendencies to be contrary to each other's continuance) in today's society. The first contradiction arises from tensions between the economic forces of production and local ecological conditions, the second from tensions between reproduction and production: The particular form of production in modern society -industrial production, both capitalists and state

> socialist- creates accumulating ecological stresses on air, water, soil, and biota (including human beings) and on society's ability to maintain and reproduce itself over time (Merchant, 1992:9).

These authors highlight the ongoing critical problem of the relationship between human activities and ecosystems from different perspectives. Shiva points out the characteristic of industrialization as a detour from the concept of sustenance. As a result, the industrialization creates artificial needs and increases the exploitation of natural resources. Beck argues that the advent of nuclear and chemical contamination (which is the by-product of industrialization) brings human beings to unescapable situation from the risk of 'the destruction through decision-making of all life on this planet' (Beck, 1992:101). Merchant analyzes the cause of ongoing environmental problems as industrialization lying in contradiction to ecology, and biological and social reproduction.

Therefore, these analyses describe the problem at one point of time (i.e. at this moment) or at two points of time (i.e. at the beginning and at this moment). However, it is also important to analyze the process of the transformation of the relationship between human activities and ecosystems. Here I discuss the complexity of the problem at this moment in view of the entropy law and with particular reference to the Japanese.

3-1-1. Subsistence society

Originally human activities depended on local ecosystems as sources of metabolical and socio-economic activities. People could acquire subsistence, such as food, fuel, fiber, materials for shelter from their local ecosystem. Some local ecosystems are self-sufficient and required minimal imports for the survival, salt was a typical example. Waste caused by human activities, such

as disused materials, garbage, human and animal excreta, could also be assimilated and decomposed into nutrients and minerals (i.e. soil fertility and water) within their local ecosystem. Thus, human activities were almost completely fashioned by the natural cycle of matter within their local ecosystem.

Because they are dependent on their local ecosystem, people are inevitably conscious of the environmental and livelihood consequences of their socio-economic activities on their local ecosystem. Swidden farming is such example where farming plots are left fallow for a certain number of years, which is determined by the capacity of the local ecosystem.

3-1-2. Swidden farming in Japan

Until the mid-1950s, swidden farming was practised in mountainous areas throughout Japan before it drastically disappeared in subsequent years. According to the agricultural census of 1950, there were about 9,533 hectares of swidden farming plots, and about 110.5 thousand households practising swidden farming. However, in the 1960 census, swidden farming was disregarded as a statistical item (Sasaki, 1979:1-6).

Many rural communities practised swidden farming as a supplementary activity to supporting their families. However, there were also several communities throughout Japan, whose life had depended on swidden farming[4].

For example, Narada, in the central mountainous area of Japan, was one

[4]Tadayoshi Himeda (Minzoku Bunka Eizo Kenkyusho) filmed and documented the several cases of swidden farming in Japan: i.e. Tsubayama Kochi-prefecture, Oku-miomote Niigata-prefecture, Nishi-mera Miyazaki-prefecture, and Narada Yamanashi-prefecture.

such community[5]. The history of Narada can be traced back to the seventeenth century in official records, and to the eighth century by oral tradition. Until the 1920s, Narada had geographically been isolated due to the high mountains, the steep-walled valley and the fast-flowing stream. Therefore, people's life in Narada had depended on their local ecosystem. They produced millet, buckwheat, barely, wheat, and beans by swidden farming and normal farming[6]. They also depended on other food from nature (i.e. hunting, fishing, and gathering). They obtained the fiber for clothes from wisteria; and they earned money by woodwork (i.e. footwear, boxes), with which they purchased minimum necessities such as salt, and rice for special occasions. It is noteworthy that the deep dependency of the people on the local ecosystem was confirmed by the research in the early 1980s that there were the 302 varieties of vegetation in nature, out of which the 89 varieties of vegetation were utilized by people, including 24 for food, 10 for daily tools, 6 for the raw materials of woodwork, 5 for fiber, 3 for medicine, and so on (Minzoku, 1987).

Swidden farming plots covered about 270 hectares. These were burned every 16 years, cultivated for 3 years and left fallow for 13 years. Available land for swidden farming was located within the land height from 800 meters to 1,500 meters and slopes facing south (i.e. the determination by 'nature'), and within 5km from the community (i.e. the determination by 'human ability'). Almost all available land was utilizes for swidden farming. Therefore, for a long periods of time, the local ecosystem had determined the size of the village, which was constantly divided among between 40 and 50 households

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[5]The people of Narada also abandoned swidden farming for supporting their livelihood in the late of 1950s (Minzoku, 1987:12).

[6]According to the agricultural Census in 1975, the total normal farming land in Narada was 99.1 ares, which was too small for supporting the life of Narada (Minzoku, 1977:10).

comprising 200 to 270 persons (Minzoku, 1987).

The case study of Narada demonstrates that the steady state of a subsistence society was maintained by the close relationship between human activities and the local ecosystem. In other words, people who had acquired the skills and behaviour for coexisting with the local ecosystem had been able to survive in a subsistence society.

3-2-1. Japanese Pre-industrial society

The transition of the Japanese society from a subsistence society to a pre-industrial society is characterized as the result of the development of transporting systems by animals and boats which used natural power sources i.e. wind, current. As a result, people became concentrated at a certain place (i.e. the emergence of an urban center) and brought the surplus of food produced in their periphery (i.e. their neighbouring ecosystems) by the new transport systems.

Urbanization, however, produced excess waste (particularly, human excreta) beyond the assimilative capacity of a local ecosystem. It is obvious that the excess waste caused hygiene problems, which then tended to cause infections, such as cholera, pestilence, and so on.

There are potentially two approaches to solve the problem of excess waste in a pre-industrial society. One is that human beings have developed systems (such as sewage) which discharge and diffuse human excreta from a pre-industrial urban area to external places (i.e. 'other's' ecosystems or 'nature'). Thus, the pre-industrial urban area maintains its steady state by

inputting food and outputting human excreta[7]. The other is that human beings have contrived to decompose human excreta (in the form of concentration) into nutrients and minerals by bacteria and fungi, and then, reuse them as part of the natural cycle of ecosystems.

People in urban centers were, therefore, able to secure their everyday life by exploiting other's (particularly, neighbouring) ecosystems. In other words, people live in urban centers were not necessarily conscious of the consequence of their activities on their local ecosystem, but of their conscious acquisition of subsistence by depending on other's ecosystems.

3-2-2. The ecological city: Edo in the 18th and 19th century

In the eighteenth and nineteenth century, decomposing and recycling human excreta was practised at Edo (the former name of Tokyo). The feudal era under the Tokugawa government (1602-1867) in Japan had closed the country for the most of the period. Therefore, subsistence food and commodities were completely circulated within the territory and could support about thirty million people which was about a quoter of the present Japanese population. Edo, the capital city, in that period could maintain more than one million people who used rice as staple food. Firstly, the Tokugawa government

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[7]De Swaan (1989) describes the situation in the Netherlands:
"In the earlier days, the transport of safe drinking water to the cities and of waste-water away from the cities was organised by the frequent coming and going of transport vehicles and boats. During the eighteenth and nineteenth century, Dutch cities started to develop and construct a system of drinking water and sewage pipes, the 'venous-arterial system'" (quoted in Mol and Spaargaren, 1993:434).

established the commerce system which accumulated huge amounts of rice[8] in Edo. Rice was brought from throughout Japan by sailing boats. Secondly, human excreta was carried to farms behind the city and applied there as manure. Vegetables were supplied from these farms to Edo[9]. Thirdly, the Edo Bay, the inland sea in Edo, became nourishing by inputting nutrients and minerals from Edo and its hinterland, and then, various sea food (i.e. fish, shrimp, shellfish, and seaweeds) was also harvested and supplied to Edo (Murota and Tsuchida, 1979:222; 1989:121-122).

It is noteworthy that the circulation of matter turned arid land at the vicinity of Edo into forest. This was partially attributed to birds which in nature ate insects in the farming land behind Edo, and again brought nutrients up to the arid land (Tsuchida, 1992:74).

Rice was mainly produced at paddy fields throughout Japan (i.e. the other's ecosystems of Edo). According to the increase of the demand on rice in the cities, not only Edo, but also other local cities, rice production had increased at the Tokugawa era, and people had changed the input into paddy fields. Firstly, they irrigated the fields and collected natural nutrients and minerals contained in the water which ran from the mountains. Secondly, they applied animal, human and green manure to their fields. Thirdly, they applied the so-called 'kin-pi', small dried fish, such as sardine, caught in local

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[8]In the Tokugawa era, the production ability of rice was the measurement of national account (like Gross Domestic Product) for the government and local governors. Also the salary of samurai (bureaucrats as well as warriors) were paid in rice.

[9]This agricultural practice had continued for a long period. When I was a child in the 1960s, the practice could still be seen in rural areas.

Murota and Tsuchida describe the difference between the western society and Japan in 16th century on the treatment of human excreta:

> In 1586, Luis Frois, a Jesuit missionary from Portugal who spent the last twenty-four years of his life in Japan, wrote 'While in the west we pay people to remove human excreta from our cities, in Japan it is bought and paid for in rice and money' (Murota and Tsuchida, 1979: 225).

coastal waters (Murota and Tsuchida, 1989:121-122).

The Tokugawa era demonstrates that, in Japanese pre-industrial society, human intervention into ecosystems was not always negative, but it was necessary to improve the reproduction capacity of the ecosystems (i.e. the stability of the steady state) by utilizing the natural cycle of matter in ecosystems carefully and appropriately. Therefore, this suggests to the present society that there are possibilities for relatively complex industrialized societies to maintain or even improve the steady state of ecosystems, as long as human beings are primarily concerned with the natural cycling of matter in ecosystems.

3-3-1. Simple industrialized society

The transition from a pre-industrial society to a simple industrialized society was accompanied by the invention and innovation of motive power (i.e. steam engines and internal-combustion engines).

A motive power system operated by steam was invented in 1707 for pumping up water in a coal mine. Then, the system was developed (e.g. James Watt's steam engine innovation in 1765)(Tsuchida, 1982:70-74) and applied to transport (i.e. steam ships and locomotives). Furthermore, the motive power system of an internal-combustion engine powered by coal gas was invented in 1860 followed by an engine suitable for gasoline in 1885. As a result of these technical changes, small as well as large transport systems could be invented (Tsuchida, 1982:75,94-95).

The invention and innovation of motive power caused the transition of the energy resources for human activities. Human and animal power in a pre-industrial society is determined by the input/output efficiency of food (i.e.

a comparison: how much food supply is required for human or animal work; and how much food production is expected). On the other hand, the motive power requires coal and/or oil as low entropy energy resources (i.e. input), and can exploit a huge amount of coal and/or oil (i.e. output) as further resources. Thus, the predominant low entropy energy resources for human activities had shifted from agricultural product (i.e. food) in a pre-industrial society to underground energy resources (i.e. coal and oil) in a simple industrialized society (Tsuchida, 1982:67-77). The advancement of transport (i.e. steam ships, steam locomotives, automobiles, and so on) facilitated the transition by drastically improving transport capacities in terms of distance, speed and volume. This caused a drastic change in the relationship between human activities and ecosystems. Firstly, the transition of major low entropy energy resources from food to coal and oil meant that human beings could acquire the energy resources which were not determined by ecosystem energetics because underground resources of energy (i.e. coal and oil) were basically delinked from ecosystems. On the other hand, agricultural production (i.e. food) was entirely linked with the natural cycles of matter through ecosystems.

Secondly, the new industries, inventions and energy sources (i.e. motive power, transport, and coal and oil) enable human beings to industrialize society by acquiring huge amount of metals for industry. For example, they supplied coal and/or oil to mining sites; exploited ores using motive power; transported the ores to the industrial centers; smelted the ores by using coal and/or oil to produce industrial metals; and transported the metals to urban centers for further human activities. I define this stage of industrialization as 'simple industrialization'[10].

Thirdly, simple industrialization demanded a large number of urban

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[10]The 'simple industrialization' is compared with the next stage of 'complex industrialization'.

workers. This situation contributed to further growth of the urban population. Transport, then, contributed to bring large quantities of food from distant places to the urban centers by using coal and oil. In other words, the people in urban centers became less dependent on their local ecosystem.

Consequently simple industrialization generally benefited urban centers through capital accumulation, and an increased supply of food from other's ecosystems.

3-3-2. Simple industrialization and environmental problems in Japan

The closing years of the Tokugawa era (which was the agriculture based 'pure' pre-industrial society) faced the threat of invasion and colonization by the western countries, and was forced to open the country in 1858. Concerned with the situation, the government started to establish a Western styled modern navy: they between 1855 and 1859 acquired four steam ships and invited experts from the Netherlands (Kattendyke, 1860: translated by Mizuta, 1964:5-8,24-28,56-57). This was the first acquisition of motive power in Japan and, therefore, can be seen as the starting point of simple industrialization.

In 1868 the Meiji government, which was the successor of the Tokugawa government, made as a national priority the transformation of the country from an agricultural-based pre-industrial society to the industrialized and militarized modern society similar to the West. During this period the government aggressively imported capital goods and invited technical experts for industrialization.

The copper mining industry played an important role in this transition during the early period, which Shoji and Sugai describe:

> Related industrial laws were established and, by 1877, mining, financed by private capital, had grown rapidly. Copper was especially important

> for the new government, because its exports brought in much-needed foreign money. ... [M]ost of the copper produced in Japan was exported. Copper earned 9.5 per cent of Japan's export earnings in 1890 ... The earnings were used to purchase mining equipment, military weapons, and other industrial machinery (Shoji and Sugai, 1992:18).

The Ashio copper mine, which had operated since the Tokugawa era, was an example of both the industrialization and environmental problems in the simple industrialized society.

Due to the discovery of a large copper ore lode in 1884, the Ashio mine started the modernization process (to increase production capacity, reduce the need for labour, and cut the cost of production). In 1885 it installed steam engines (i.e. modern equipment) for ore-digging and crushing, water pumping and ore slurry. The Ashio mine had completed into modernization in 1893 and installed various equipment, such as telephones, smelters, a hydro-electric turbine, an electric pump, and so on. As a result, the Ashio mine became the leading copper producer (the complex of copper mining and smelting) in Japan. It produced about 6,000 tons per year (Shoji and Sugai, 1992:19-21).

However, the increase of copper production caused serious environmental problems. All the trees surrounding the mine were blighted by the end of 1884. Massive fish death occurred in the Watarase River in 1885. A flood occurred in the Watarase river basin in August 1890 polluted 1,600 hectares of farmland and 28 towns and villages by copper poison. Another flood occurred in September 1896 and polluted a total area of over 46,723 hectares. The pollution also affected the health among local people, which was clearly demonstrated by the Birth/Death Rates per 100 population: while the national average was 3.21/2.60 in 1895, the rate in the affected area was 2.80/4.12 in 1898 (Shoji and Sugai, 1992:21-22,27,32).

Considering these problems, in February 1897, Shozo Tanaka, who was a

member of the National Diet[11] and representing the region, raised questions on the government's responsibility for the problems at a National Diet session, and he demanded the closure of the Ashio mine. Furthermore, he attempted to voice the problems in public and to protest against further industrialization. He had organized the local people in several demonstrations, petitioned in courts, and in 1901 attempted to appeal to the Emperor directly. He also became a resident of most affected village, Yanaka Village. The government's response to these demands was not to close down the mine, but to abolish Yanaka Village by force in 1907 and to construct a poison catchment dam there (Shoji and Sugai, 1992:28-40,56-57; cf. Wake, 1993:13-14).

Shoji and Sugai arrived at the conclusion that the government's planned investment to tackle the environmental problems of the Ashio mine was not intended for protecting the local people but for allaying the environmental concerns of the population of Tokyo:

> The Watarase River flows into the Tone [River], from which the Edo River [which was the major water source for Tokyo] divides itself. The flood in 1896 brought great damage to Tokyo and the government was concerned with possible public outrage. In 1988 the estuary bottom of the Edo River was covered with concrete and the mouth of the river was narrowed to one-third its original at Sekiyado. Then the point where the Watarase joins the Tone was widened so that the Tone water could run back into the Watarase. ... All the construction work in and around the rivers was done for the purpose of creating a large poisons catchment basin (Shoji and Sugai, 1992:38).

Shoji and Sugai also argue that the problem in the periphery were obviously oppressed in the name of the national interest:

> The politicians and journalists who supported the farmers against the Ashio copper mine fell away when the Russo-Japanese War broke out [in 1904]; in fact, the opposition networks against the mine were completely disbanded during the war ... (Shoji and Sugai 1992:45).

This case illustrates that, during simple industrialization, the population

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[11]The Imperial Diet was founded in 1890, which was constituted by the Lower House, whose members were elected, and the Upper House, whose members were appointed by the Emperor.

In 1891 Shozo Tanaka was elected for the Lower House from Tochigi Prefecture (Shoji and Sugai, 1992:23-24).

in the urban centers maintains the steady state of their local ecosystem while externalizing the reproduction capacity of that ecosystem. People in the periphery suffers from the death of the steady state of their ecosystems (i.e. other's ecosystems) by the over-production of food and the damage carried by industrial pollution.

3-4-1. Complex industrialized society: the threats to human survival

The advancement of industrialization since the period of simple industrialized society has arrived at the new stage of the relationship between industrialization (i.e. human activities) and ecosystems. Because, although simple industrialization caused environmental problems within a geographically limited area (i.e. unequally distributed in a periphery), industrialization has complexly 'developed' (therefore, I define this as complex industrialization), and globalized, having influences over all the spheres of human activities and all geographic space. It therefore begins to threaten the entire global ecosystem and, by definition, the very survival of human beings.

While pollution during simple industrialization tended to be limited within a local ecosystem in periphery, pollution in complex industrialization tends to expand from local to regional, and even global problems. In other words, the threats from the complex industrialization are not confined to local ecosystems and people who live in the periphery, but also to the global ecosystem and all people on Earth.

Firstly, nuclear wars and nuclear plant accidents are recognized as potential threat to human survival through the Japanese experience of the actual bombings at Hiroshima and Nagasaki in 1945, and the catastrophic accident of the Chernobyl Nuclear Power Plant in 1986. However, the

possibility of the occurrence of critical incidents is masked by the power configuration of government, scientific institutions and the business sector. For example, there is the belief that the holding of nuclear weapons by certain countries will prevent nuclear war (i.e. a nuclear deterrent). The power configuration also suggests that the nuclear plants[12] in Western countries are absolutely safe due to technological advancement and qualified management systems[13].

Secondly, the human-made stable toxic substances which are diffused into ecosystems threaten human survival chronically and steadily. Human beings have created many varieties of new materials (chemicals[14], radioactive substances, heavy metals, and so on), and some of them are stable toxic substances. No matter why the stable toxic substances are produced on a large scale, they are inevitably diffused and integrated into the natural cycle of ecosystems, but not decomposed into natural and harmless substances (i.e. nutrients and minerals) in the ecosystems for long periods of time[15]. Therefore, they

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[12]Nuclear plants include nuclear power plants, reprocessing plants, and other related facilities.

[13]See Beck, 1992:105

[14]UNEP states:
"World-wide, about ten million chemical compounds have been synthesized in laboratories since the beginning of this century. The European inventory of Existing Commercial Chemical Substances (EINECS) lists 110,000 chemicals" (UNEP, 1992:249).

For example, organochlorines, which are substances containing chemically combined chlorine and carbon, have been created about 11,000 varieties and produced a huge amount of their goods (Johnston and McCrea, 1992:2). There are very many stable toxic substances among organochlorines, such as polychlorinated biphenyls (PCBs), chlorofluorocarbons (CFCs), dioxins, and so on.

[15]Johnston and McCrea describe the stable toxicity of organochlorines:
"[M]any organochlorines persist in the environment for long periods of time. Some may take 100 years to break down completely into harmless chlorides, while others do not degrade at all to any appreciable extent. For instance, it has been calculated that, in pure water, chloroform will persist for 1,850 years. Moreover, when organochlorines do break down, they usually produce other organochlorines ... and these

steadily expose human beings more or less equally[16] to low-intensive toxicity in everyday life. The threat to individual lives (e.g. a higher risk of cancers) and reproduction ability (e.g. low sperm counts (BBC Horizon, 1993)) gradually increases.

There are two problems related to the mass production of stable toxic substances. One is when the toxicity of new materials is discovered or acknowledged after their mass production. Thus, human beings have experienced that safe and convenient materials being suddenly referred to as toxic substances[17]. Then new materials are again developed as 'necessary' substitutes, however, some of the new materials will later also become turn into toxic substances. In other words, the question is not whether, but which new materials turn into toxic substances[18]. The other is that stable toxicity

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> do break down, they usually produce other organochlorines ... and these are often more toxic and far more hazardous than the original substance (Johoston and McCrea, 1992:10).

[16]People who have knowledge and information on the issue may reduce the risk a little bit but not drastically by purchasing organic food, natural and clean water, and so on. For example, a survey in the Netherlands in 1988 showed that 'over 150,000 people had decided to stop drinking normal tap water and switched to alternatives' (e.g. bottled 'natural water' from Norwegian fjords)(Mol and Spaargaren, 1993:434-436).

[17]A typical example of such change is Polychlorinated Biphenyls (PCBs). Although PCBs had widely been used in electrical and other equipment since the late 1920s, in 1966 Jenson demonstrated that PCBs appear as pollutants (UNEP, 1992:250). In 1968 in Japan, the Kanemi cooking oil poisoning incident occurred: then, in 1971 PCBs was discovered as the cause of the incident (Ui, 1992a:10). As a result, the Japanese government totally banned their production and use in 1972 (Asahi, 1994). In the United Kingdom and the United States of America, the voluntary manufacturing ban of PCBs came into effect from 1977 (Johnson and McCrea, 1992:8).

[18]The following statements imply that the safety of commercially produced chemical substances is uncertain:

> "1,000 new substances [become] available every year. Existing testing facilities world-wide only can test 500 substances each year - and only then at great cost" (OECD, 1991; quoted in UNEP, 1992:249);

and,

> "Testing a chemical for multiple toxicological endpoints take up to 64 months and that in 1985 a pre-chronic study cost $US575,000 and the cost of a chronic toxicity and carcinogenicity study amounted to $US1,300,000" (IPCS-IRPTC, 1990; quoted in UNEP, 1992:251).

of substances is the side effect or by-product of some production, such as nuclear fuels, nuclear waste (i.e. radioactive substances), and so on. The production or occurrence of the substances is simply accepted as the inevitable burden for achieving benefit. Then, the produced stable toxic substances are attempted to delink from the natural cycle of ecosystems. However, for example, huge amounts of nuclear waste are produced from the production of nuclear fuels and weapons, the operation of nuclear plants, and the disposal of old nuclear reactors and related facilities. It seems that there is no way to delink all nuclear waste from ecosystems completely and permanently. Radioactive substances are also inevitably diffused into ecosystems, at least, gradually (Tsuchida, 1982:110-123)[19].

Even though a stable toxic substance can be prohibited, other toxic substances additionally accumulate in ecosystems. In other words, as far as creating new human-made materials, the synthetic toxicity of various stable toxic substances in ecosystems inevitably increases. Moreover, it is obvious that the total toxicity of accumulating various stable toxic substances is far less visible and less provable of the relationship between cause and effect (i.e. the threats to human survival) than the toxicity of a single stable toxic substance.

Thirdly, the threats to human survival are not only the toxicity of human-made materials, but also the broad degradation and destruction of ecosystems, which occur as a result of over-disposal and over-harvesting non-toxic substance including natural nutrients and minerals.

The use of huge amount of fossil fuels (i.e. oil, coal and natural gas) emits huge amount of carbon dioxide (CO2), nitrogen oxides (NOx)[20] and sulfur

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[19]See Deere-Jones, 1991:18

[20]A mixture of nitrogen mono-oxide (NO), nitrogen dioxide (NO2).

oxides (SOx)[21], which are regarded as the cause of global environmental problems (i.e. the threat to human survival) as follows. The increasing emission of carbon dioxide is regarded as the major contributor (i.e. 49.0% among greenhouse gases) of global warming during the 1980s (Smith, 1993:21)[22]. The emission of nitrogen oxides and sulphur oxides is regarded the cause of acid rain which degrades and destructs forests and living organisms in rivers and lakes, and which occurs throughout the world (e.g. Eastern and Western Europe, Northern America, China, India, Malaysia, Mexico, Brazil, Japan)(Ishi and Torii, 1991:258).

The use of energy inevitably causes waste heat, the amount of which is already comparable with that of sunlight. For example, in Japan the total energy amount of waste heat equals to about 4% of the total energy received by sunlight. Furthermore, areas which release huge amount of waste heat are not equally distributed on Earth, but concentrated at the four poles (i.e. the east and west coasts of America, Western Europe and Japan)[23]; therefore, the waste heat released from these four poles affects the global climate configuration, and causes unstable weather in the world (Tsuchida, 1982:102-103).

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[21]A mixture of sulfur dioxide (SO2), sulfuric anhydride (SO3), and so on.

[22]Worldwatch Institute analyzes global warming:

> "The long-term historical record of sea- and land-based measurements shows ... that the global temperature has climbed over the last century by a total of about 0.5 degrees Celsius. The nine warmest years ever recorded have all occurred since 1980" (Worldwatch, 1994:60).

The institute analyzes the concentration of carbon dioxide in the air:

> "The atmospheric concentration of the principal greenhouse gas, carbon dioxide (CO2), has continued to rise as a result of fossil fuel burning and deforestation. In 1993 there was 13 percent more CO2 in the air - 357 parts per million- than in 1959, the first year in which it was systematically measured" (Worldwatch, 1994:66).

[23]In 1990 the total amount of energy used for human activities in the world was 8,664 million tons of oil equivalent, out of which 26.4% was used in Northern America, 16.8% was in Western Europe, and 6.4% was in Japan (calculated from Van Ettinger, 1993:5).

The trade of huge amount of biomass (i.e. agriculture, fishery and forestry products) means that local ecosystems which export the biomass lose nutrients and minerals (i.e. soil fertilities) in the forms of products and soil erosion. Therefore, exporting local ecosystems tend to be malnourished. The trade also means that local ecosystems which import the biomass receive these nutrients and minerals as products. Therefore, importing local ecosystems tend to be overnourished and cause the problem of waste assimilation[24]. As a result, both exporting and importing ecosystems seriously degrade, and face the danger of the death of their steady states.

Plastics are highly tolerant to corrosion and decomposition, such as polyethylene, polypropylene etc (Wake, 1993:100). Therefore, the mass production of these plastics causes the accumulation of waste matter which cannot be decomposed into nutrients and minerals in ecosystems[25]. This also causes the serious degradation of ecosystems.

The steady state of Earth has begun to swing by the influence of the complex industrialization. Whether or not this swing will bring Earth towards the death of steady state, it is enough to threaten the survival of human beings, as well as that of very many other living organisms.

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[24]The problems which occur at both ends of this biomass transportation is partly described for the Netherlands. See Songambele (1992) and Netherlands Committee for IUCN (1994:57-66).

[25]Whether plastic wastes should be incinerated or dumped in end disposal sites is controversial issue in Japan: there are the serious shortage of end disposal sites throughout Japan, therefore, some local governments, such as Yokohama city, are incinerating plastics for reducing the volume of wastes; however, other local governments, such as Tokyo, are dumping in end disposal sites, because there are risks to diffuse toxic substances, such as dioxin, from incineration plants (Risaikuru, 1993).

3-4-2a. The South: Pollution export from Japan

As I mentioned earlier, during simple industrialization in Japan, industrial pollution was marginalized and the people living in polluted areas were suppressed by the rest of society under the name of progress or national interest. However, in parallel with the economic recovery since the end of the Second World War, industrial pollution had magnified throughout Japan in 1960s: very many industrial pollution related diseases (e.g. Minamata disease, Yokkaich asthma, Itai-itai disease, the second Minamata disease, Amagasaki asthma) occurred and caused death and serious health problems among local people; thus the Japanese civil society became aware that industrial pollution was not simply acceptable as the dark side of development, nor negligible as the incidents in the periphery, but the serious burden of industrialization for the entire society. Due to this situation, the Japanese industries were forced technological invention and innovation for preventing the problems of industrial pollution. However, some heavily polluting industries also took an alternative strategy. They simply relocated heavy polluting plants from Japan to the South where environmental regulations are relatively loose or absent, and continued to discharge toxic substance there, which is the so-called 'pollution export'.

People in Chiba city who suffered from pollution (particularly air pollution by dust, sulfur oxides, and nitrogen oxides) caused by steel production in Kawasaki Steel Corporation, strongly protested the emission of pollutants[26]. Under the condition, the company had faced the difficulty to

[26]I was also suffering from the same problem at Kitakyushu, where the first and biggest steel manufacturer had operated since 1901. Their plants had outputted the huge amount of pollutants into air and the inland sea in front of the plants, which was about 10km in length and 2km in width. When I spent my boyhood in the 1960s there: many children including myself were suffering asthma due to the air pollution; very many malformed fish were found in the sea due to the accumulation of pollutants at the bottom of the sea.

construct a new plant. Thus, the company proposed transferring its iron ore sintering plant to the Philippines, which is the most polluting process in steel production (i.e. it is estimated that 60% of NOx, and 50% of SOx cause from this process). Then the proposal was approved by the Philippine government in February 1974[27]. On the other hand, in March 1975, the construction of the Blast Furnace No.6 was finally agreed between Kawasaki Steel Corporation and the Chiba city government.

In 1977, as a result of the arrangement with the Philippines govenment, Kawasaki Steel Corporation could start the operation of the iron ore sintering plant in Mindanao, the Philippines. The plant imported iron ore from Australia, Brazil and Canada, processed the iron ore to sintered ore, and then exported the sintered ore to a specific blast furnace, that is the Blast Furnace No.6 of Kawasaki's Chiba Ironworks in Japan (Yokoyama, 1992:25). This case enabled Yokoyama to observe the nature of the Japanese 'pollution export':

> [C]rude oil, iron ore and other natural resources are not the only items which large Japanese companies want to secure from the "Third World". A pollutable environment, large and enclosable areas of land, water and other resources for industrial use are also much sought after by Japanese firms (Yokoyama, 1992:27).

However, it is obvious that 'pollution export' was realized not only by the sole decision of the company, but also withthe cooperation of the government. Furthermore, the Japanese civil society, particularly the people in Chiba city in this case, was less enthusiastic to prevent the pollution export than to

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[27]Asahi Shinbun (a leading daily newspaper in Japan) dated on 9 January 1974 reported:

> "Japanese Prime Minister [kakuei TANAKA] made an official visit to ASEAN countries at the beginning of 1974. Marcos [the Philippine President] is reported to have told Tanaka that the Philippines would happily accept Japanese factories which could not expand in Japan because of troubles over environmental pollution" (quoted in Yokoyama, 1992:26).

Marcos again talked his intension to accept the 'pollution' to the other Japanese newspaper, Yomiuri Shinbun, which was reported on the newspaper dated on 29 January 1977 (Japan Bar Association, 1991:80).

reduce the emission of the pollutants there. Therefore, Yokoyama's observations criticize not only Japanese firms, but also pay attention to the responsibilities of the entire Japanese society.

'Pollution export' is created by the fact that governments and the civil society in general are not entirely against steel production, but against the emission of pollutants in Japan. Because steel production was the driving force of economic growth in Japan, it enable many people to sustain their livelihood with the existence of the company and its downstream industries.

There are other cases of pollution exports such as the Layte copper smelting plant in the Philippines (Japan Bar Association, 1991:96-109), the Asahan aluminium refinement projects in Indonesia and Albras in Brazil (Yoda, 1992:58-59). There is the case of nuclear waste related diseases among local people in Bukit Merah, Malaysia (Yamaka, 1985; AMPO, 1992; PAN, 1994; Kojima, 1994:21-22; Japan Bar Association, 1991:48-60).

The case of pollution export demonstrates that the perspective of the urban population was focused on sustaining their local ecosystems or environment by the input of necessary goods and materials and the output of waste. Once people can externalize the pollution from their local ecosystem and receive purified intermediate materials from other's ecosystems for further their activities, they tend to ignore the problems of the marginalized periphery in the South.

3-4-2b. Stable toxic substances: 'Acute' toxicity

Huge amount and varieties of newly created materials (i.e. chemicals, heavy metals, radioactive substances) have been used for the various goods. Some of these new materials are stable toxic substances, and caused serious health

problems and deaths among people who were exposed by the relatively large amount of a such toxic substance through food and water in the 1950s, 1960s and 1970s.

The Morinaga arsenic milk incident which occurred, was caused by the accidental arsenic contamination of baby powdered milk in 1955. In 1956, the Minamata disease was discovered, which was caused by organic mercury pollution of inland sea, which exposed people to the contaminated fish in Minamata. In 1964, the Itai-itai disease was discovered, which was caused by the cadmium pollution of the Zintsu river[28]. In 1965, the second Minamata disease was discovered, which was also caused by the organic mercury pollution through the contaminated fish in Niigata. In 1968, the Kanemi cooking oil poisoning incident occurred, which was caused by the accidental PCB contamination of cooking oil (Ui, 1992a:9-10).

In the late 1960s and 1970s, the seriousness of industrial pollution including stable toxic substances were well recognized among Japanese. Because the people of urban centers were also suffering from some industrial pollution (e.g. soot, NOx, SOx). Therefore, they could recognize pollution problems as an internal threat, and sympathize with the victims of the above diseases which were caused by the acute concentration of stable toxic substances in the periphery. Thus, the Japanese civil society could have successfully made pressure to create environmental policies on industrial activities[29], which forced the Japanese industries to invent and innovate new technologies and materials for preventing pollution. This subject will be elaborated in Chapter four of this study.

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[28]The itai-itai disease was recognized in 1955, however it was in 1964 that cadmium pollution was discovered as the cause of the disease.

[29]In 1970 the pollution related laws were enacted, and in 1971 the Environmental Agency was established.

3-4-2c. Stable toxic substances: 'Chronic' toxicity

In the 1980s environmental discourse adopted the claim that Japan could overcome industrial pollution problems which had been experienced in the 1960s (Awaji, 1994). The high level of concentration of a pollutant had generally disappeared throughout Japan, therefore, the pollution problems became less visible for urban population. However, very many varieties of stable toxic substances have been steadily diffused into local and global ecosystems, and accumulated in the form of chronic toxicity, as has already been explained.

The gradual diffusion of stable toxic substances is obvious at waste management sites. Firstly, collected 'fly ash' in garbage incineration plants contains heavy metals and dioxin (Wake, 1993:117-122)[30]. The fact demonstrates that stable toxic substances diffuse into ecosystems through consumer goods, and implies that huge amount of such stable toxic substances will not be collected and remain in ecosystems.

Secondly, the managed end disposal sites in Japan which are dumping sites specially designed to delink toxic waste from local ecosystems by covering the bottom and sides of there with rubber sheets of 1.5mm thick. The waste containing stable toxic substances (e.g. ash from garbage incineration plants, mercury contained fluorescent lamps, batteries, pesticide) are dumped there. Once there is rainfall, the toxic substances leak out into the water. Therefore, the government forces the managed end disposal sites to built facilities for collecting the water and retrieving the toxic substances which are dumped there again. It is obvious that these facilities cannot assure that the toxic substances have been entirely collected. Therefore, much of the toxic substances will be diffused into local ecosystems not rapidly but

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[30]The toxicity of 'fly ash' was acknowledge by the national government in 1992 (Wake, 1993:117-122).

gradually (Morizumi, 1990:44-59; Wake, 1993:64-67).

Thirdly, according to a leading Japanese newspaper, Asahi Shinbun dated on 8 August 1994, polychlorinated biphenyls (PCBs) which was totally banned in Japan in 1972 due to the occurrence of a serious PCBs-related disease (i.e. the Kanemi cooking oil incident). Consequently, the government, at that time, ordered all enterprises to store PCBs and their products strictly. However, the recent investigation to these enterprises by the Tokyo Metropolitan Government found that more than one-third of the PCBs had been lost (Asahi Shinbun, 1994). This means that most of the PCBs has diffused into ecosystems deliberately or incidentally[31].

The cases demonstrate that, once a stable toxic substance is produced in large quantities, it inevitably diffuses into ecosystems rapidly or gradually. This situation implies that very many varieties of diffused stable toxic substances are accumulating in ecosystems, which differs from acute toxicity: i.e. concentrated stable toxic substance (resulting in the pollution diseases). Because the relationship between cause and effect by the accumulation of many varieties of diffused stable toxic substances in an ecosystem is far less visible in the eyes of sciences (i.e. chronic toxicity) than that of massive discharge of a single stable toxic substance in an ecosystem (i.e. the cause of pollution diseases). However, the total amount of stable toxic substances accumulating in ecosystems is increasing. Therefore, it is possible to assume that the environmental crises and the eventual threat to human survival are steadily accelerating no matter whether or not they are provable.

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[31]There are very many examples how it is socially difficult to prevent the diffusion of stable toxic substances, such as illegal dumping all over the country, the huge amount of ocean dumping, and so on. (cf. Kumamoto, 1994)

3-4-2d. Nuclear power plants: Operation and discourses

Since the mid-1970s the discourses on the nuclear energy policy in Japan (such as the safety and the cost analysis of a nuclear power plant and nuclear waste management, and the necessity for sustaining current living standards by nuclear power plants) have been continued between the power configuration (which I define as the configuration between bureaucrats, politicians, and business sector) and the Japanese civil society (particularly the anti-nuclear social movements).

The arguments from the social movements have been convincing to warrant an end of these discourses. Firstly, nuclear waste management is required for hundreds years or more. For future generations, a forced labour which produces no benefit for them, but just consumes their precious resources under the fear of radiation (Tsuchida, 1982:119-120). Secondly, it is impossible that human beings could predict all nuclear accidents and hence avoid them, particularly in a country with frequent earthquakes like Japan.

Despite the rational and scientific arguments on the danger of nuclear power plants by the social movements, and the fact that serious accidents of nuclear power plants actually occurred at the Three Mile Island in the United States of America in 1979, and the Chernobyl in the former Soviet Union in 1986, the power has claimed the absolute safety of the Japanese nuclear power plants[32].

It is noteworthy to point out the fact that, once the emission of carbon dioxide (CO2) has been recognized as the global environmental problem (i.e.

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[32]The Atomic Energy Safety Committee assessed the absolute safety of the Japanese nuclear power plants that the probability of the occurrence of a severe accident (like the Chernobyl's level) in Japan is less than one accident per 100 reactors for 1,000 years (Nagasawa, 1992:451). From my point of view, the probability under the current condition of 42 reactors' operation does not demonstrate the absolute satay, but the high risk of a severe nuclear accident.

global warming), the power has claimed that nuclear power plants are clean and environmentally friendly technology relative to fossil fuel based thermal power plants. This argument is not only claimed by the business sector, such as the electric companies, but also by the national government.

The "Genshiryoku Hakusho (White Paper on Atomic Energy)", the official policy paper on nuclear energy repeatedly states that the contribution of nuclear power plants is bound to solve global environmental problems:

> In recent years, global environmental problems, such as global warming and acid rain, are highlighted. ... Nuclear power does not produce carbon dioxide and nitrogen oxide during its power generation process. Comparing the emission of carbon dioxide of a nuclear power plant including a fuel production process with that of other power plants, according to a trial calculation by the Institute of Energy Economy of Japan, a nuclear power plant emits 4 units of carbon dioxide, on the other hand, coal, oil and liquefied natural gas (LNG) based thermal power plants emit 100, 78 and 67 units of carbon dioxide respectively. So that a nuclear power plant is expected to play significant role to solve global environmental problems such as global warming (Atomic Energy Commission, 1992:29)[33].

From my point of view, although both the emission of carbon dioxide and the possibility of accidental radioactive contamination by nuclear power plants are equally serious threats to human survival. It is naive to choose the toxicity of radiation instead of that of carbon dioxide.

The example of nuclear energy discourses demonstrates the crucial problem on the relationship between the magnifying threat to human survival by the complex industrialization and the rational and scientific discourses on the threat. In parallel with the continuous discourses, for a long period of time, the number of nuclear reactors has increased in Japan. Hence, the threat to human survival by complex industrialization tends to be magnified by power interests despite serious discourses.

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[33]It is noteworthy that there is also the opposite argument that 'a major expansions of nuclear generating capacity would result in huge increases in CO2 emissions from the nuclear industry due to the need to mine and process progressively lower quality uranium ores' (Mortimer, 1991:129).

3-4-2e. Biomass trade: Destruction of local ecosystems

The period between the mid-1980s and the early 1990s is known as the powerful economic growth period, e.g. for the period between 1987 and 1990 increased real Gross Domestic Product (GDP) by an average of 5.2% a year (Kojima, 1992:2-3). Also the growth is characterized by the so-called 'bubble economy', which was caused by surplus money originating from the speculation and sharp increase of land prices throughout Japan. For instance, total land price in 1990 was double that of 1985 (Kojima, 1992:123).

The most important official guide to the Japanese economy at that time was 'the report of the study group on Economic Structural Adjustment for International Harmonization', or the so-called 'Maekawa Report', released in 1986, which suggested that:

> Japan should transform its industrial structure and make greater efforts to stimulate domestic demand, and [to move] from being just a big exporting country to becoming a large importing country, too. In particular, imports of agricultural products and meat and milk products should be increased (quoted in Fujiwara, 1991:37).

According to the Ministry of International Trade and Industry, food imports had increased from 15.5 billion U.S.Dollars in 1985 to 31.6 billion in 1990, and the wood imports had also increased in amount from 3.7 billion U.S.Dollars in 1985 to 7.5 billion in 1990 (Ninomiya, 1993:126). These figures show implicitly that these imports also drastically increased in volume.

The other form of environmental problems has recently coincided with the increase of imports and the difficulty in the assimilation of general waste[34] produced by society, e.g. from 43,440,000 tons in 1985 to 49,970,000 tons in 1989 (Ichihashi, 1993:45). As a result, many local governments in urban centers face the problems of swamping incineration capacity and a shortage of

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[34]General waste in Japan includes waste from households, offices and restaurants.

dumping grounds, which is acknowledged as the second garbage war throughout Japan (Wake, 1993:34-51).

However, the problem is not just local or national, it is one aspect of a global environmental problem. The other aspect, of course, is the environmental degradation of local ecosystems which export biomass (i.e. agriculture, fishery and forestry products). For example, Japan has increased the import of shrimp (including prawns) since the early 1960s (e.g. 304,202 tons in 1990; cf. 2,484 thousand tons of world production in 1988). In the late 1960s and 1970s shrimp fishing by the Japanese trawlers had heavily damaged the marine ecosystems of the adjoining seas of Indonesia. As a result, the Indonesian government banned, in 1983, all forms of trawling in Indonesian national waters. Moreover, the ban led the trawling agencies to the aquaculture of shrimp in the coastal areas of South-east Asia including Indonesia, which caused the broad destruction of mangrove forests (Murai, 1987; Seto, 1992).

Although there are many cases of destruction of local ecosystems due to the Third World exports to Japan, the problem is treated as an assimilation problem in Japan.

3-4-2f. Interpreting the cases of complex industrialized society

The above Japanese experiences demonstrate that the ongoing environmental crises, which seem to bring human beings towards extinction, are complex. The one of the characteristics of the complexity is the invisibility of cause and effect. The relationship between cause and effect by the accumulation of many varieties of diffused stable toxic substances in an ecosystem is far less visible in the eyes of sciences than that of the massive discharge of a single

stable toxic substance in an ecosystem. Japanese have experienced such discharges as pollution related diseases, such as the Minamata disease, the Kanemi cooking oil poisoning incident by the PCB contamination, and so on. In other words, discourses on the causality of a single toxic substance as chronic toxicity to human beings are irrelevant for the discourse on human survival. As I discussed earlier, the nuclear discourses in Japan made the causality of problems invisible or confused the cause/effect outcome of the problem.

The other issue is the invisibility of global environmental problems. As I discussed earlier, pollution export is a global environmental problem. The trade of huge amount of biomass is also part of the causes of the global environmental problem at both ends of local ecosystems. However, in view of Japanese society (the importer of biomass and purified industrial intermediate materials), it could not recognize clearly what happens in other's local ecosystems, especially those who export biomass and raw materials. In other words, consumption is delinked from the production processes. Therefore, global environmental problems tend to be more seirous, particularly in the periphery.

The cases of complex industrialized society in Japan demonstrates that Beck's notion of the 'end of the Other (Beck, 1992:109)' should be understood in juxtaposing that the threat to human survival is not only the 'end of the Other', but also and more deeply the invisibility of that by the complexity of the problems, intentionally masked by power configurations, discourses, and the delinkage between consumption and production processes.

Chapter 4

The Political Response to the Environmental Crises

In the 1960s, in parallel with the rapid economic growth, the environmental problems caused by industrial pollutants magnified throughout Japan. Serious pollution related diseases (the Minamata disease, the Itai-itai disease, and so on) occurred in the periphery of Japan. The people of urban centers also suffered from heavy air pollution (e.g. soot, NOx, SOx). Under such situation, many pollution-victim-based citizens' movements occurred and were supported by broad constituency within civil society. Thus, the movements could make a strong pressure to the government to regulate industrial activities (Ui, 1992a:3). In response to the situation, the government built a package of environmental pollution regulations in 1970, established the Environmental Agency in 1971, and guided industries to invest for pollution preventions (Wake, 1992:140-141). The government also, at the same time, cooperated with industries for their pollution export to the South (Yokoyama, 1992:26).

As a result, the emission of soot and SOx from industrial plants drastically reduced in the 1970s. Although the problem of NOx emission still unsolved, in the 1980s the environmental discourses occurred, which claimed that Japan could overcome industrial pollution problems in the 1960s (Awaji, 1994). The claim seemed to be generally accepted in civil society because there was few visible pollutants in urban centers.

Global environmental discourses have emerged since the late 1980s. The government has responded to the discourses by starting that Japan should contribute to conserve global environment as well as to sustain 'development' by its advanced technologies (Awaji, 1994).

However, the global environmental crises are derived from the

advancement of technologies, magnifying and threatening to human survival. Considering the situation, to solve the crises, we should not focus on technologies alone, but also on changing human behaviour and attitudes to redirect human activities towards creating a sustainable society. Therefore, politics should play an important role in solving the crises. In this chapter, I discuss the possibility of alternative politics from within civil society and what measures could be used in solving the crises.

4-1. Power configuration

Power configuration in Japan could be characterized as the interdependence of three elements: politicians, bureaucrats and the business sector. Firstly, the significance of power configuration lies in the relationship between the powerful bureaucrats and the relatively powerless politicians, which is precisely described by Van Wolferen:

> Since the early 1960's Japan's politicians have not played a significant role in determining national policy, with the sole exception, perhaps, of the brilliant and controversial Kakuei Tanaka. Despite periodic efforts by such talented politicians as Yasuhiro Nakasone, there has not been effective political oversight over bureaucratic decision-making. This bureaucratic decision-making has almost exclusively been restricted to administrative matters (Van Wolferen, 1993:56).

Due to the relationship between powerful bureaucrats and powerless politicians, a historical shift in politics has occurred from the one party domination (Liberal Democratic Party for 38 years) to the creation of new coalitions. Since July 1993 has included the former opposition party (Japan Socialist Party). The coalition cabinets have repeatedly clung to the succession of former policy which has included controversial policies such as nuclear energy and U.S.-Japan Security Treaty.

Secondly, the significance of the relationship between politicians and

the business sector lies in the huge amounts of political donations and bribery which not only the former ruling party relied upon but also some members of other parties. Since the arrest of the former prime minister Kakuei Tanaka due to the acceptance of a bribe in 1976, scandals have continuously occurred. A current scandal has disclosed a close relationship between large general construction companies and politicians.

Thirdly, there is a significant relationship between bureaucrats and the business sector, sometimes institutionalized, in the appointment of former bureaucrats to high positions in private companies. Thus, private companies often have close relationships with bureaucrats.

Under such power configuration, it seems unrealistic to believe that conventional political and economic power alone can redirect the ongoing trend of complex industrialization, and solve the problems facing human survival. Because the problems at this moment are quite complex and the causality of the problems is far less visible than pollution related diseases in the 1960s and 1970s. Therefore, according to past disputes between power holders and civil society on pollution related diseases (particularly the Minamata disease)[35] and nuclear safety, the attitude of the power towards the problems is obvious that the power configuration will create various scientific discourses on each issue, and prolong and, as a result, magnify the problems.

4-2. Civil society versus Power configuration

Since the middle of the 1970s Japanese civil society has been disillusioned with social movements in their efforts to resist the state. The disillusionment is related to the collapse of radical social movements in the

[35]See Ui (1992b).

early 1970s, such as the movement against U.S.-Japan Security Treaty, the movements for the liberalization of universities, etc[36]. During the collapsing process, high level of internal violence, including murders within an activist group[37] and amongst activist groups[38], had occurred. I believe that this violence has, at least partly, damaged social movements, particularly the visible and perceived conflict raised by social movements including peaceful demonstrations on the streets, in the eyes of civil society.

Previous disillusionment in the early 1970s provided at least a partial reason for that the Japanese civil society has just given support to, or sympathized with, the visible conflict of social movements in the limited arena where their living conditions are in danger, such as the anti-pollution, the anti-nuclear energy, the anti-development movements and so on at local level.

4-3. Within civil society: Consumption pattern

Bocock describes the transition of consumption pattern during the economic expansion after the Second World War in Western societies:

> As the majority ... of the populations of western capitalist societies became more affluent, the mode of consumption changed from one

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[36] I.Muto and R.Inoue(1985) elaborate the upsurge of the Japanese New Left, which is characterized as radical social movements, until the early 1970s.

[37] The murder within an activist group of the Japanese New Left, the so-called 'Rengo Sekigun (United Red Army)', was discovered in March 1972. The group killed 14 comrades in the name of a lack of support for the idea of 'communization' (Nakamura, 1972:7; Takagi, 1988:117-121).

[38] The groups of the Japanese New Left, which are Kakumaru, Chukaku and Kaiho, have killed each other since August 1970. Total number of murdered were recorded 83 people as of August 1988 (Takagi, 1988:130-140).

> concerned primarily with basic material provision ... to a mode concerned more with the status value and symbolic meaning of the commodity purchased (Bocock, 1992:133).
>
> The emerging affluent working class in western societies from 1950 onwards was seen as a new relatively undifferentiated 'mass' market by producers, department stores, advertisers and distributors of all types of what were termed 'consumer durables', such as televisions, washing machines, cars, transistor radios and record players (Bocock, 1992:133).

A similar situation of mass production and mass consumption in the undifferentiated 'mass' market had also occurred in Japan since the 1960s. In the 1960s and 1970s, the rapid economic growth created the capacity of mass consumption among the majority of Japanese. Although it is difficult to say that the Japanese workers became 'affluent' at that time, they could earn certain surplus and realize mass consumption of industrial commodities due to the long periods of work.

Mouffe describes the relationship between modern consumption and a social transformation in the context of Western societies:

> [A] 'commodification of social life' has destroyed a series of previous social relations and replaced them with commodity relations (Mouffe, 1988:92).

One of the characteristics of 'commodification of social life' is 'the transformation of people into mere consumers' (Mouffe, 1988:92).

Baudrillard (1988) attempts to redefine consumption in western societies:

> Neither the quantity of goods, nor the satisfaction of needs is sufficient to define the concept of consumption: they are merely its precondition. Consumption is neither a material practice, nor a phenomenology of 'affluence'. ... Consumption is the virtual totality of all objects and messages presently constitute in a more or less coherent discourse. Consumption, in so far as it is meaningful, is a systematic act of the manipulation of signs. ... This suggest that there are no limits to consumption (quoted in Bocock, 1992:166-167).

This definition of consumption shows that people do not only consume for their immediate needs, but also consume for differentiating to the others. Therefore, the situation was analyzed as 'there are no limits to consumption'.

Ohira, a Japanese psychiatrist, reports the same behaviour towards consumption that a light mental problem is spreading among Japanese, which he has named the syndrome of 'material tellers'. These people are very interested in materials. They gather information on materials in details, and try to purchase more expensive and 'high qualified' materials comparing with their financial abilities. Ohira analyzes that they attempt to differentiate from other people by purchasing expensive materials, or to receive affection from related people by donating expensive materials. He also analyzes that they are less capable to maintain human relations, and need a way to evade from stress caused by bad human relations. Therefore, they try to substitute human relations for material relations (Ohira, 1990:2-11).

Considering the present environmental crises such consumption pattern should be changed from within civil society where most consumers are located. In other words, it is necessary to formulate broad constituency within civil society for encountering the consumption pattern.

Moreover, a valid question is who creates differences in consumer goods. Then, we should consider the situation that we are not well informed about the difference on the toxicity or the unfair production process of goods from producers. Thus, it is obvious that we are forced to consume the intentionally constructed differences by producers.

4-4. The role of new social movements in Japan

The present environmental crises are complex. The causality of the crises is invisible. The unsustainable consumption pattern is broadly accepted in civil society. The power is confined among politicians, bureaucrats and the business sector. At this moment, the above situations are the threats to human

survival.

Therefore, the redirection of human activities towards sustainable society depends on the change of civil society itself. Then, the civil society should play important role to change the attitude of the power configuration.

Among the various actors within civil society, I analyze the capability of new social movements for the change through two case studies below.

4-4-1. Organic farming movements

Organic farming, which basically does not apply chemical pesticides and fertilizers in the agricultural production process, has developed many links with the urban consumer and has been popular in Japanese society for several years. I contend that purchasing organic vegetables from a certain network is widespread amongst urban families with children. Organic vegetables can also be bought in 'normal' supermarkets. In addition, in 1993 the government introduced controversial standards for organic produce. These phenomena are the reflection of the complex industrialization which has created and diffused the human-made toxic substances into the natural cycle of ecosystems.

4-4-1a. The emergence of organic farming movements

The emergence of organic farming can be traced back to the early 1970s. The following social factors have been influential since the early 1960s. Firstly, the rapid economic growth caused serious air, river, sea and ground pollution which caused serious health problems in many localities through food chain (such as fish, rice). This contamination of staple food caused widespread

concern. Secondly, agricultural modernization by the mechanization of production process depended on the intensive input of chemical pesticides, herbicides and fertilizers. This situation caused many chemical chronic poisoning patients among farmers. Thirdly, the liberalization of food imports increased the distance between rural farmer and urban consumer. The consumer no longer identified the food as part of the production cycle but merely as another commodity on the supermarket shelf. The link between food and source was broken.

4-4-1b. TYK and Daichi: Vanguard or Popular

In 1973 a distinguished organic farming group, Takahata-cho Yuki-nogyo Kenkyukai (TYK), was established at Yamagata prefecture. Their motivation for beginning organic farming was their concern regarding health problems and land degradation caused by the application of chemical pesticides, herbicides and fertilizers to their farmland (Masugata, 1991:197).

At the beginning, TYK attempted to tie up with a large and established consumer cooperative for marketing their vegetables. However, the attempt collapsed after a short period in 1975 because the consumers preferred a strictly standardized product in terms of size and shape. The market preferred cheaper and beautiful vegetables, which looked more like an industrial commodity, to heterogeneously-shaped organic produce (Aoki, 1991:33).
TYK then changed their strategy and focused on establishing relationships with small consumer groups in urban areas. Initially, their motivation for networking with urban consumers came from practical and economical reasons. There was a need to bypass existent commercial intermediaries, and take responsibility for the distribution themselves. Later TYK developed a deeper

concept of networking as a 'face to face relationship between farmer and consumer', which included the consumer's direct assistance in the fields (Aoki, 1991:33-34). A leader of TYK, Hoshi, describes an example of this 'face to face relationship' as follows:

> I enclose my handwritten message in every apple box. I describe what has happened during the growth process of the apple, which includes information on the climate, the condition of diseases and insects, my family and local movements. My friends and consumers who live far away can shorten the distance by reading my message and eating my apple. Particularly the person who has participated in the farming in my farmland is convinced that she or he has been concerned in the growth process of rice, apple, vegetables, and so on (Hoshi, 1992:54).

TYK and small consumer groups are thus examples of new social movements which are conducting 'an experimentation with and direct practice of alternative frameworks of sense' (Melluci, 1988:248) through an everyday actions to overcome the 'commodification of social life'. Furthermore, it appears that the collapse of links with a large cooperative and the success with small consumer groups demonstrates the importance of the everyday actions of each individual.

TYK has itself actually faced several environmental problems in its own locality in the last few years, such as a golf course construction project, an industrial waste disposal project, and the illegal dumping of industrial waste. However, TYK managed to fight off these obstacles and have successfully pursued their own project of revitalizing the village through connections with the urban consumer (Hoshi, 1992:55; Masugata, 1991:211).

Recently, more complex networks between farmers and consumers have emerged. 'Daichi wo Mamoru Kai' (Daichi), of which I was a member in Tokyo, is a typical example of such a complex network. Daichi provides a computerized ordering system of organic produce to member consumers who can choose the organic produce from their weekly list of about 200 items, including information about the produce, and receive the produce the following week directly to their homes. Thus, member consumers can purchase from Daichi

almost all kinds of daily food as organic produce. Such links between organic producers and urban consumers can be materialized by the tie-up between Daichi and many organic farmers throughout Japan.

Daichi plays an intermediary role between farmers and consumers, not only in the distribution of produce but also in the interchange of knowledge, the creation of closer relationships, and the organization of consumers and/or farmers into a social movement. Compared with TYK, it seems to me that the principal of a 'face to face relationship' and everyday actions for overcoming the 'commodification of social life' have been weakened by this network and particularly from the consumer's point of view. However, Daichi is still distinct from a simple 'commodity relation' in commercial market mechanisms because the consumer always receives background information about the produce and has many chances to visit or assist farmers. Also, it is noteworthy that Daichi has played a significant role in some social changes such as the recycling of paper milk containers, the anti-nuclear power plant movement, and so on.

TYK consumers are thus required to commit themselves to participate in a new social movement, whereas, the consumer of Daichi has a choice as to whether or not to take part. In other words, TYK is a vanguard in the organic farming movement, and Daichi is a popular and diffuse expression of the movement. TYK is certainly important for changing the Japanese society towards sustainable society because TYK has created new concepts and suggested an ideal, yet practical, type of movement. However, that Daichi is also equally important for that purpose because Daichi is more accessible to consumers who have no notion of social movements or problems. Here the consumer can automatically exercise daily, or at least weekly, alternatives to the dominant 'commodity relation' through ordering and eating organic produce. This is very important for acquiring a broad constituency for changing the consumption

pattern from within civil society.

4-4-2. Milk Pack Recycling Movement

Until the early 1970s most milk in Japan was delivered everyday to each household in a glass container, which was then collected and reused repeatedly. However, nowadays, most milk is sold at market in paper container, the so-called milk pack. Such change has occurred and been accepted by the public since the milk pack is lighter than the glass container. The advantage for consumers is that they are able to purchase milk while doing their daily shopping, which is convenient for them because they become free from the inflexibility of a monthly contract for purchasing milk used in the previous delivery system. On the other hand, many people, particularly those who had participated in consumer movements, cooperative movements, and so on, were concerned about the change, from a reusable container to a disposable container, as a wasteful use of resource and/or a waste-assimilation problem. I believe that such views are closely related with doubts about the current life-style in Japan in general.

Under these circumstances, various social movements and concerned people got together, and formed the nationwide network of milk pack recycling movements in 1985. Existing various new social movements in addition to inputs from concerned people could successfully mobilize actively and rapidly expand the movement. Thus, the movement is regarded as a quite successful citizens' movement in Japan.

However, the milk pack recycling movement is controversial as a social movement. The movement is particularly criticized for its collaborative attitude towards the business sector such as paper manufacturers, milk

packers, retailers and so on.

4-4-2a. The emergence of milk pack resycling movement

Despite the existence of a recycling system for waste paper which was well functioning commercially, the milk pack had been rejected as a resource for this recycling because the milk pack is coated with plastic laminate and requires additional processing in the paper recycling plant for removed of the laminate.

Initially, only one small paper manufacturer had purchased remnant and misprinted milk packs directly from milk pack manufacturers, and utilized then as the raw material for producing toilet paper (Morizumi, 1993:95). Therefore, the collaboration with the manufacturer was the precondition for starting the milk pack recycling movement in 1985[39]. In connection with this collaboration, it was necessary for the movement to establish alternative collecting channels for the used milk pack from households through the wholesale waste paper stores to the manufacturer. Also handling the milk pack required a different and time-consuming approach compared with the handling of other recycling materials. For example, the milk pack had to be washed, unfold and completely dried at each household, otherwise the milk pack would get mouldy and become useless as recycling material.

Despite such restrictions, many existing social movements, such as the cooperative movements, organic farming movements, consumer movements, movements for the social participation of handicapped people, and so on, participated in the milk pack recycling movement. Also many concerned people,

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[39]According to Morizumi, 13 manufacturers utilize milk pack as the resource for toilet papers in 1993 (Morizumi, 1993:95).

who were mostly women, particularly 'housewives', established local groups for milk pack recycling and participated actively in the movement.

According to Koshi-janaru (The Recycling Paper Journal) dated on 11 October 1993, the usage of the milk pack as a resource for toilet and tissue paper is approximately 6,000t per month, out of which about 3,600t is recycled from household through various recycling channels (Risaikuru Bunka, 1994:22). 1kg of the milk packs is equivalent to about 30 of the 1-litre-container which implies that every month more than 100 million milk packs were washed, unfolded and dried throughout households in Japan. This means that a great many people are practising milk pack recycling everyday.

I mentioned above the collecting process of the milk pack from household to paper manufacturer. It is also important to clarify the characteristics of the milk pack as a resource for toilet papers. There are two widely used types of toilet papers in Japan: one are 'pure-pulp' toilet papers made from 100% of imported virgin pulp; the others are 'recycled' toilet papers predominantly made from various waste papers which are collected commercially. The toilet papers made from milk packs have been recognized as a new and improved category of toilet papers in the 'recycled' toilet paper market. Because the 'recycled' toilet papers without milk pack are generally regarded as low quality. However, the 'recycled' toilet paper made from about 30% of milk pack and about 70% of other waste papers improves its quality, and looks like 'pure-pulp' toilet papers.

There are also two types of toilet paper manufacturers corresponding to the two types of toilet papers in the above: one are large manufacturers which produce the 'pure-pulp' toilet papers; the others are small-and-medium manufacturers which produce the 'recycled' toilet papers.

Since the mid-1980s the large manufacturers have expanded their production capacity, which correlated with strengthening the Japanese currency

and decreasing the import prices of raw materials. As a result, large manufacturers could increase their market share, thus, three small-and-medium manufacturers closed down in 1992. This decrease in small-and-medium manufacturers may lead to the collapse of the waste paper recycling system in Japan (Morizumi, 1993:83-98). Since this time, the milk pack recycling movement has proceed to further collaborate with both the small-and-medium manufacturers and the retailers by intensively promoting the sales of the toilet papers containing milk pack (Morizumi, 1993:97; Risaikuru Bunka, 1994:22-27).

Although the above is direct concern of the milk pack recycling movement, the important point in this study is to analyze whether the movement has potential to change civil society or the power configuration towards sustainable society. I discuss the below.

4-4-2b. The dynamism: An internal perspective

I directly participated to the milk pack recycling movement during the period between 1989 and 1993 as a staff member of Association Sahel, which is a Japanese Non-governmental Organization (NGO). The NGO was established in 1987, to cooperate for the fight against desertification in the Sahel region, the southern edge of the Sahara desert in Africa, and pursued rural development projects by planting trees and cooperating with local agriculture in Mali. However, we realized that, as we were concerned with global environmental problems, we should also grapple with changing our own Japanese life-style, which seemed to be one of the serious cause of global environmental problems.

Therefore, in 1989, Association Sahel decided to participate in the milk pack recycling movement, and started a series of activities. Through these

activities, we found many people who were convinced of the necessity of the movement and started to organize milk pack recycling groups with neighbours.

Based on these small groups, some evolved their actions further. For example: they lobbied to local governments to support the milk pack recycling by providing stockyards, subsidies and so on, and later, to change their policy on waste in general; they approached schools, where it is generally quite restrictive to accept any message or opinion from civil society, and delivered their message, regarding environmental problems and the importance of changing life-styles to students; and they actively tackled on other environmental problems such as the tropical forest destruction by Japanese companies[40]. It is noteworthy that, among them, there are many people who had not participated in any social movement nor political action.

Experiences could be shared among the participants of the movement, through the national network and sub-national networks. In particular, they could learn how to bargain with local government and widely draw public support from many local governments throughout Japan.

4-4-2c. The analyses: Conflict and Solidarity

Despite the fact that the milk pack recycling movement has mobilized many people including people who had not participated in any movement in civil society, the movement has been criticized by the leading people of other social movements. The strongest and most common criticism of the milk pack

[40]Japan imports huge amount of tropical timber from the Southeast Asia, which creates environmental and social problems at logging sites. Particularly, the non-violent blockade of logging roads since 1987 by indigenous people in Sarawak, Malaysia, has drawn public awareness on this issue. Thus, the social movements against commercial logging and import of tropical timber by the Japanese companies have emerged throughout Japan (AMPO, 1993:55).

movement is due to its collaborative attitude towards the business sector such as paper manufacturers, milk packers, retailers and so on.

According to Tsuchida, who is a long time opinion leader of the anti-nuclear energy movement, as well as a distinguished scientist on Entropy, the milk pack recycling movement legitimates the usage of milk packs by the business sector and facilitates the transformation from reusable containers to disposable containers. In other words, the movement reinforces the system which creates the current life-style instead of breaking the system (Tsuchida, 1992; I.Yoda, 1993:14-23).

Furthermore, he makes the distinction, based on attitudes to the power configuration[41], between two types of movements within the new social movements: one type are the movements which restrict the power configuration to do 'bad', such as the anti-nuclear energy movement and the anti-pollution movement; another type are the movements which encourage the power configuration to do 'good', such as the milk pack recycling movement. Then, he argues that it is possible that the latter is encompassed by the logic of power and goes in the wrong direction, therefore, the milk pack recycling movement should change its strategy and follow the former form of movement (I.Yoda, 1993:14-23).

I agree with his former argument that social movements encouraging the power configuration to do 'good' always faces the great risk of co-option. However, I believe that this point does not always legitimate his latter argument that social movements should be limited the strategy of restricting the power configuration to do 'bad'.

I would like to analyze these arguments, and the milk pack recycling

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[41]I define the power configuration as the interdependence of three elements which are politicians, bureaucrats and the business sector. Tsuchida's notion of the 'power' has no particular distinction between bureaucrats and the business sector in his argument. Therefore, I use the term of the power configuration in the same way.

movement, by applying Melluci's analytical tool which defines a social movement as a form of collective action (a) based on solidarity, (b) carrying on a conflict, and (c) breaking the limits of the system in which action occurs (Melluci, 1985:795).

In my point of view, the emergence of both types of new social movements are closely related with the collapse of the radical social movements in the early 1970s and the disillusionment of that. Therefore, the Japanese civil society has just given support to, or sympathized with, the visible conflict of social movements in the limited arena where their living conditions are in danger, such as the anti-pollution, the anti-nuclear energy, the anti-development movements and so on at local level. This analysis corresponds precisely with Tsuchida's notion on social movements restricting the power configuration to do 'bad'.

This means that the social movements restricting the power configuration to do 'bad' are directly in the position of visible conflict with the power configuration, however, as the solidarity with the visible conflict approach is limited in civil society, the movements tend to be isolated and face difficulty in breaking the limits of the system in which action occurs.

On the other hand, the milk pack recycling movement, which encourages the power configuration to do 'good', can achieve broad-based support in civil society. This is emphasised by the fact that more than 100 million milk packs are collected every month, as mentioned earlier, and also the broad participation of existing social movements in the recycling.

Therefore, the major question regarding the underlying social relevance of the milk pack recycling movement is whether the movement is carrying on conflict and ultimately breaking the limits of the system which has facilitated the domination of disposable milk pack containers in the Japanese market.

If the milk pack recycling movement and its participants just focus on collecting milk packs and selling its toilet paper efficiently, I believe that the movement cannot break the limits of the system. Furthermore, it is highly possible that the concentration on such specific aspect takes effect to hide away more serious problems from the eyes of civil society including the participants of the movement themselves. For example, the major consumer of imported woods and pulp is not milk pack nor toilet papers but disposable material in forming concrete panels for construction (shuttering), newspaper, publications and high quality paper by copy and print-out in offices etc.

However, I have often heard from very many participants of the milk pack recycling movement that they are sure that the current life-style is wrong, particularly the inappropriate usage of materials including food, even if they can not prove what and how it is wrong.

Thus, they had felt that they should start doing something to change, at least their own life-style and that of their neighbours' within civil society. Therefore, they talked with their neighbours, created small groups and participated in the movement.

In this sense, the movement is not only the collection of milk pack but also the symbolic challenge, which is a form of conflict, to the system which creates and reinforces their life-styles. Thus, the milk pack becomes the symbol of inappropriate usage of materials, and of the destruction of nature.

It is noteworthy that, in emphasising the symbolic recognition of milk packs as the destroyer of Earth, the general assembly of the national network of the movement has been held every year under the slogan of "let's deliver the green Earth to children" since 1990.

Furthermore, there are many people and groups in the social movements who are trying to go beyond the collection of milk packs, and to break the limits of the system: such as changing local government policy, delivering

their message to school, tackling on other environmental problems. Therefore, the milk pack recycling movement is a form of low-intensity social conflict, and breaking the limits of the system little by little.

Chapter 5

Conclusions

The image I developed about Japan's complex industrialization could be equated with an overnourished person, facing serious health problems due to overconsumption. That person is then advised by various health experts about how to overcome the problem, including sports (gymnasium or golf course) 'good' medication etc. However, the experts never prescribe simple recipe: I.e. that person must reduce his or her food intake drastically.

The advancement of human socio-economic and business activities, particularly industrialization, has externalized environmental problems and relocated them from urban centres to other's ecosystems. Eventually, this has magnified the environmental problems of the periphery. A vicious circle instigated by complex industrialization began to threaten the steady state of ecosystems, and with it the survival of human beings, not only in Japan but also throughout the world.

Therefore, for humans to survive, it crucial that they overcome the problems of complex industrialization and to amend the fundamental relationship between human activities and ecosystems. This poses a quest for a sustainable society in which human activities are almost located within their local ecosystem, maintaining the steady state of the society and ecosystem. In other words, human activities are fashioned by the natural cycle of matter in their local ecosystem without the accumulation of entropy. These conditions mean that human activities do not depend on underground matter, but on local biomass.

The creation of a sustainable society may be realizable as an isolated

mode of livelihood by a few people who are really committed to its virtues. However, at this moment, it is obviously unrealistic for most human societies to create a sustainable society. Because the world population has rapidly grown during the industrialization period[42], population is unevenly distributed. And the negation of underground matter, particularly oil, seems the complete negation of the foundation of the prerequisite of the current human civilization. Thus, the realization of an entire sustainable society on Earth will take a long periods of time and serious societal and economic transformations to realize.

Therefore, what we should do at this moment is to frustrate the present trend of complex industrialization which brought human beings closer to triggering off the road to extinction. Changes the present patterns of production and consumption require the redirecting of human activities towards the ethos of a sustainable society. This redirection will be only possible when the relationship between human activities and ecosystems is drastically changed. As I have mentioned earlier, such change will not come from further advancement of technologies, but from within civil society by overcoming the present consumption pattern, creating realistic alternative lifestyles, formulating broad constituency to support or identify with the alternatives, and changing the power configuration.

I have analyzed the organic farming movements and the milk pack recycling movement and suggested their legitimacy as a type of new social movement contrasting another type of new social movement, epitomised by the anti-nuclear energy, the anti-pollution, the anti-development movement.

In this study, not only the organic farming movements and the milk pack

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[42]The world population is estimated 0.7 billion people in 1750 when industrial revolution had started in the Britain; and 5.3 billion people in 1990 (Ninomiya, 1993:32).

recycling movement but also the alternative life movements[43] are characterized as movements putting emphasis on solidarity within civil society. I define political tools of their activities as the "solidarity approach", focusing closely on everyday life. On the other hand, the resistance approaches to the anti-nuclear energy, the anti-pollution, the anti-development movement are characterized as 'visible conflict' movements. Therefore, I define their activities are against the power configuration, and are carried out by limited numbers of people and/or over a limited time.

Thus, the different actors create the different roles. The visible conflict approach can demonstrate the limits and the problems of the system by direct action. However, the visible conflict approach should not assume that civil society will accept the issue against which they are demonstrating and support them automatically. Civil society is also flooded with the counter arguments and propaganda from the power configuration, which facilitates scepticism to the "facts" claimed by the proponents of the visible conflict approach. In addition, civil society is dependent on the "facts" proclaimed by the power configuration.

For example, the anti-nuclear energy movement at the national level has confronted the power configuration for a long time, it seems to me that the criticism of the nuclear energy policy is a persuasive argument for cancelling it and is also well known in civil society. However, the propaganda from the power configuration is also quite strong, thus, the movement has not yet been able to cancel nor restrict the policy. Even though the anti-nuclear movement has faced this difficulty in breaking the limits of the system, in this case,

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[43]According to Muto, "[t]ypical such alternative life movements is the cooperative movement which developed rapidly in the 80s, creating direct links between consumers and producers, stepping into arena of local politics, and involving hundreds of thousands of women, mostly housewives, who would otherwise have stayed away from any movement participation". He also analyzes that "the alternative livelihood cooperatives ... emerged as a new phenomenon in response to the social climate of the 1970s" (Muto, 1993:4).

such visible conflict with the power configuration is the only possible strategy for solving the problem.

Comparatively, the solidarity approach is, at least partly, the product of disillusionment with social movements since the early 1970s in the eyes of civil society, and can itself provide a partial, alternative framework within civil society. Many people can exercise elements of an alternative lifestyle everyday, which is a crucial step towards realizing the difference between their current lifestyle and realistic alternatives. Formulating fundamental sense to realistic alternative lifestyles goes beyond just an abstract knowledge. However, it is difficult to realize the limits and problems of the system which hinders the ability of civil society to materialize alternative lifestyles. This is largely because the movements tend to evade visible conflicts with the holders of power, and the power configuration superficially collaborates with them, while making efforts to maintain the current system.

It would seem, therefore, that cooperation between the solidarity approach and the visible conflict approach is crucial for breaking the limits of the system and for formulating alternatives. The visible conflict approach demonstrate the limits and the problems of systems. On the other hand, the solidarity approach encourages the exercise of everyday alternative lifestyles, and increases the number of people who are sensitised to alternative lifestyles in civil society, and formulates solidarity from within households, neighbours and civil society. A combination of these approaches allows the coming together of a broad constituency resisting the system.

I argue that there is the need for more cooperation between the solidarity and visible conflict approaches within the Japanese civil society. The project should be focused on the country (i.e. Japan) but obviously conscious of the fact that Japan operates within a global system. Because the ultimate model of a sustainable society is a self-sufficient society,

environmental social movements tend to advocate material delinking from the South. However, pollution export and trade of biomass demonstrate that the Japanese civil society have an obligation to compensate the South for the failure of its 'development model'. Moreover, the steady state of global ecosystems cannot be achieved in isolation: by Japan alone or the North, and because it is globally inter-connected, Japan needs the South in order to a create sustainable society.

Reference

Aoki, T. (1991) 'Takahata-cho Yuki-nogyo Kenkyukai no Seiritsu to Tenkai (The formulation and evolution of Takahata-cho Yuki-nogyo Kenkyukai' in K.Matsumura and T.Aoki (eds) **Yuki-nogyo-undo no Chiiki-teki Tenkai (The regional evolution of Organic farming movement)**, pp.31-40. Tokyo: Ie-no-hikari

Asahi Shinbun (1994.08.08.) 'Hokan PCB ga Yukue-fumei (Stored PCB has been disappeared)' in **Asahi Shinbun International Satellite Edition**, p.4. London: Asahi Shinbun

AMPO (1992) 'The Mitsubishi/ Asian Rare Earth Affair: Malaysian villagers fight pollution exports' in **AMPO Japan-Asia Quarterly Review**, vol.23, no.4, pp.51-53.

AMPO (1993) 'Razing the Forests: Japan's Role in Tropical Forest Destruction' in **AMPO Japan-Asia Quarterly Review**, vol.24, no.2, pp.55

The Atomic Energy Commission (1992) Genshiryoku Hakusho (White Paper on Atomic Energy), Tokyo: the Ministry of Finance

Awaji, T. (1994) 'Kankyo Seisaku: Environmental policies' in Asahi Sinbun International Satellite Edition (1994.06.05), p.4. London: Asahi Shinbun

Baudrillard, J. (1988) 'Towards A Definition of 'Consumption'' in M.Poster (ed.) **Selected Writings**, pp.21-25. Cambridge: Polity Press/ Oxford: Backwell

BBC Horizon (1993) **Assault on the Male: Transcript of the programme transmitted 31 October 1993**, London: BBC

Beck, U. (1992) 'From Industrial Society to the Risk Society: Questions of Survival, Social Structure and Ecological Enlightenment' in **Theory, Culture and Society**, vol.9, no.1, pp.97-123.

Bocock, R. (1992) 'Consumption and Lifestyles' in R.Bocock and K.Thompson (eds) **Social and Cultural Forms of Modernity**, pp.117-167. Cambridge: Polity Press

Deere-Jones, T. (1991) 'Back to the Land: The Sea-to-Land Transfer of Radioactive Pollution' in **The Ecologist**, vol.21, no.1, pp.18-23

Van Ettinger, J. (1993) **Sustainable Use of Energy: A Normative Energy Scenario: 1990-2050 (draft version; 7-11-1993)**, Krimpen, The Netherlands: Van Ettinger and Associates

Faber, M., H.Niemes and G.Stephan (1987) **Entropy, Environment and Resources: An Essay in Physico-Economics**, Berlin, Heidelberg, New York, London, Paris and Tokyo: Springer-Verlag

Fujiwara, M. (1991) 'The Resort Act: Panacea for the Construction Industry' in **AMPO Japan-Asia Quarterly Review**, vol.22, no.4, pp.37-40.

Hoshi, K. (1992) 'Nomin-teki Jiritsu no Houhouron (The methodology for farmer's self-reliance)' in **Oruta**, no.2, Autumn 1992, pp.50-56. Tokyo: The Pacific-Asia Research Center

Hubbert, M.King (1993) 'Exponential Growth as a Transient Phenomenon in Human History' in H.Daly and K.Townsend (eds) **Valuing the Earth: Economics, Ecology, Ethics**, pp.113-126. Cambridge and London: MIT Press

Ichihashi, T. (1993) 'Tokyo Dome 130-hai Bun no Gomi no Nakami ha Nani-ka (What are the content of the waste, of which quantity is equivalent to 130 times of Tokyo Dome)' in **Risaikuru Bunka (Recycle Culture)**, no.39, pp.42-47. Tokyo: Recycle Bunka-Sha

IPCS-IRPTC (1990) **Computerized Listing of Chemicals Being Tested for Toxic Effects**, Geneva

Ishi, H. and T.Torii (1991) 'Kankyo (Environment)' in J.Ueda **Chiezo: The Asahi encyclopedia of current terms**, pp.256-265. Tokyo: Asahi Shinbun

Japan Bar Association (1991) **Nihon no Kougai-yushutsu to Kankyo-hakai (Japanese Pollution Export and Environmental Destruction)**, Tokyo: Nihon-hyoron-sha

Johnston, P. and I.McCrea (eds)(1992) **Death in Small Doses: The Effects of Organochlorines on Aquatic Ecosystems**, Amsterdam: Greenpeace International

Kattendyke, W.J.C.Ridder H.v. (1860) **Uittreksel uit het dagboek van W.J.C.Ridder H.v.Kattendyke gedurende zijn verblijf in Japan in 1857, 1858 en 1859**, The Hague (translated by: Mizuta, N. (1964) **Ngasaki Kaigun Denshujo no Hibi (Days in the Nagasaki Navy School)**, Tokyo: Heibon-sha)

Kojima, N. (1994) 'Exporting Dirty Industry' in **AMPO Japan-Asia Quarterly Review**, vol.25, no.2, pp.20-24.

Kojima, S. (ed)(1992) **93-nen-ban Nihon Keizai Key Words ('93 Key Words of Japanese Economy)**, Tokyo: Keizai-Chosa-kai

Kumamoto, K. (1994) 'Japan's Hazardous Waste Exports' in **AMPO Japan-Asia Quarterly Review**, vol.25, no.2, pp.15-19.

Masugata, T. (1991) 'Takahata Yuki-nogyo-undo no Senkusei to Gendankai (The pioneering character and current situation of Takahata organic farming movement)' in K.Matsumura and T.Aoki (eds) **Yuki-nogyo-undo no Chiiki-teki Tenkai (The regional evolution of Organic farming movement)**, pp.196-212. Tokyo: Ie-no-hikari

Melluci, A. (1985) 'The Symbolic Challenge of Contemporary Movements' in **SOCIAL RESEARCH**, vol.52, no.4, pp.789-816

Melucci, A. (1988) 'Social Movements and the Democratization of Everyday Life' in J.Keane (ed.) **Civil Society and the State: New European Perspective**, pp.245-260. London, Verso

Minzoku Bunka Eizo Kenkysho (ed.) **Narada no Seikatsu to Shizen tono Tsunagari**

(Life and Nature in Narada), Hayakawa-cho Yamanashi-prefecture: Hayakawa-cho board of education

Mol, A. and G.Spaargaren (1993) 'Environment, Modernity and the Risk-Society: The Apocalyptic Horizon of Environmental Reform' in **International Sociology**, vol.8, no.4, pp.431-459.

Morizumi, A. (1990) **Yogore to Tsukiau (Let's accept dirt)**, Tokyo: Hokuto-shuppan

Morizumi, A. (1993) 'Saiseishi, Tukatte Tsukuru Risaikuru Shakai (Let's use recycled papers, and create the recycling society)' in **Risaikuru Bunka (Recycle Culture)**, no.40, pp.83-98. Tokyo: Risaikuru Bunka-sha

Mortimer, N. (1991) 'Nuclear Power and Carbon Dioxide: The Fallacy of the Nuclear Industry's New Propaganda' in **The Ecologist**, vol.21, no.3, pp.129-132.

Mouffe, C. (1988) 'Hegemony and new political subjects: toward a concept of democracy', in C.Nelson and L.Grossberg (eds) **Marxism and the interpretation of culture**, pp.89-101. Basingstok: Macmillan

Murai, Y. (1987) 'The life and times of shrimps: From Third World seas to Japanese tables' in **AMPO Japan-Asia Quarterly Review**, vol.18, no.4, pp.2-9.

Murota, T. and A.Tsuchida (1979) 'The Scarred Face of Japan' in **The Ecologist**, vol.9, no.7, pp.221-226.

Murota, T. and A.Tsuchida (1989) 'Teijo-kaiho-kei to Seimei-kei (Open Steady State System and Life System)' in K.Tsurumi and T.Kawata (eds) **Naihatsu-teki Hatten-ron (Endogenous Developments)**, pp.119-155. Tokyo: Tokyo University Press

Muto, I. and R.Inoue (1985) 'Beyond The New Left: In Search of a Radical Base in Japan' in **AMPO Japan-Asia Quarterly Review**, vol.17, no.2, pp.20-48, no.3, pp.54-73, and no.4, 51-57.

Muto, I. (1993) 'The Alternative Livelihood Movement' in **AMPO Japan-Asia Quarterly Review**, vol.24, no.2, pp.4-11.

Nagasawa, M. (1992) 'Atomic Energy' in K.Matsumura (ed.) **Joho Chishiki: Imidas (Information and Knowledge: Imidas)**, pp.446-461. Tokyo: Shuei-sha

Nakamura, K. (1972) 'Comrades Can Die, Too' in **Far Eastern Economic Review**, no.75, vo.13, pp.7.

The Netherlands Committee for ICUN (1994) **The Netherlands and the World Ecology**, Amsterdam: The Netherlands Committee for ICUN

Ninomiya, M. (1993) **Chiri Tokei Yoran (Geographical Statistics Handbook)**, Tokyo: Ninomiya-Shoten

OECD (1991) **The State of the Environment**, Paris: OECD

Ohira, K. (1990) **Yutakasa no Seishin Byouri (Psychopathology in affluence)**, Tokyo: Iwanami-shoten

People's Action Network to Monitor Japanese Transnational (PAN) (1994) 'Mitsubishi Kasei Closes Polluting Plant in Malaysia' in **AMPO Japan-Asia Quarterly Review**, vol.25, no.1, pp.4-5.

Risaikuru Bunka (1994) 'Atsumete, Tsukau Gyunyu-pakku(Let's collect and use milk pack)' in **Risaikuru Bunka (Recycle Culture)**, no.43, pp.22-27. Tokyo: Risaikuru Bunka-sha

Sasaki, T. (1972) **Nihon no Yakihata (Swidden farming in Japan)**, Tokyo

Seto, W. (1992) 'Nihon-jin no Ebi-zuki ga Ajia no Kankyo wo Kaeteiru (The Japanese preference for shrimp changes the envirnment in Asia)' in Earth Day Japan **Yutakasa no Uragawa (In the backyard of affluence)**, pp.24-25. Tokyo: Gakuyo-shobo

Songambele, S. (1992) 'Agriculture, transport, and industry' in M.Gomes,

C.Kirana, S.Songambele and R.Vora (eds) A Vision from the South, Utrecht: Jan van Arkel

Shoji, K. and M.Sugai (1992) 'The Ashio Copper Mine Pollution Case: The Origins of Environmental Destruction' in J.Ui (ed.) **Industrial Pollution in Japan**, pp.18-63. Tokyo: United Nations University Press

Smith, K. (1993) 'The basics of greenhouse gas indices' in P.Hayes and K.Smith (eds) **The global greenhouse regime, Who pays?: Science, economics and North-South politics in the Climate Change Convention**, pp.20-50. London: Earthscan

De Swan, A. (1989) **In Care of the State: Health care, Education and Welfare in Europe and the USA in the Modern Era**, Cambridge: Polity Press

Takagi, M. (1988) **Shin-sayoku Sanjunen-shi (Thirty Years History of The New Left)**, Tokyo: Doyo Bijutsu-sha

Tsuchida, A. (1982) **Shigen Butsurigaku Nyumon (Introduction of resource physics)**, Tokyo: NHK

Tsuchida, A. (1992) **Kankyo-Hogo-Undo ha Dokoga Machigatteiru -noka (What is wrong with environmental protection movements?)**, Tokyo: JICC

Ui, J. (1992a) 'Overview' in J.Ui (ed.) **Industrial Pollution in Japan**, pp.1-17. Tokyo: United Nations University Press

Ui, J. (1992b) 'Minamata Disease' in J.Ui (ed.) **Industrial Pollution in Japan**, pp.103-132. Tokyo: United Nations University Press

UNEP (1992) **The World Environment 1972-1992: Two decades of challenge**, London, Glasgow, New York, Tokyo, Melbourne and Madras: Chapman and Hall

Wake, S. (1993) **Gomi Rettou (Waste Islands)**, Tokyo: Gijutu-to-Ningen

Van Wolferen, K. (1993) 'Japan's Non-Revolution' in **Foreign Affairs**, September/October 1993, vol.72, no.4, pp.54-65.

Worldwatch Institute (1994) **Vital Signs: The trends that are shaping our future**, London: Earthscan

Yamaka, J. (1985) 'More Pollution Export by Japan: Nuclear Waste Dumping Exposed in Malaysia' in **AMPO Japan-Asia Quarterly Review**, vol.17, no.1, pp.56-59.

Yoda, H. (1992) 'Aluminum and the Recycling Movement' in **AMPO Japan-Asia Quarterly Review**, vol.23, no.3, pp.58-61.

Yoda, I. (1993) 'Risaikuru-Undo ha Hontouni Machigatteiru-noka (Does the recycling movement really go wrong ?): Tsuchida versus Morizumi' in **Risaikuru Bunka (Recycle Culture)**, no.39, pp.14-23. Tokyo: Risaikuru Bunka-sha

Yokoyama, M. (1992) 'Not in Our Backyard: Exporting Pollution to the Philippines' in **AMPO Japan-Asia Quarterly Review**, vol.23, no.3, pp.24-27.