Report of the First Phase Strategic Research

New Development Patterns

March 2001

Institute for Global Environmental Strategies

Preface

How can we transform existing economic and social systems into more environmentally benign and sustainable ones? This is the question that the New Development Patterns Project of IGES has to address. It is a formidable task.

In recent years, many Asian developing countries, which have suffered from poverty for decades, are experiencing high rates of economic growth by introducing material-intensive production and consumption patterns based on throw-away products. The accelerating trend of globalization and the fast development of information technology enhance the problems associated with current development patterns on a global scale.

The NDP Project tried to tackle a number of issues that must be considered when discussing new development patterns. There are a variety of questions which need to be addressed: inter- and intra-generational equity, globalization and its impact on sustainable development, the directions of technological advance and their implications, and desirable environmental governance structures, etc. Certainly, there is a long way to go to arrive at the final goal. The result of the first phase research of NDP is but a preliminary one on this important subject. We hope that our study will contribute to the better formulation of policies and that it will stimulate further work in this important area of research.

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Outline of the Project

1. Project Name

New Development Patterns Project

2. Project Period

July 1998 – March 2001

3. Project Members

Project Leader

Kazuo Matsushita

Research staff

Research associates	Takashi Otsuka (1999.5-)
	Rie Sugiyama (2000.4-)
	Shuzo Katsumoto (2000.4-)
Project secretary	Naoko Miyazaki (1999.1-)

4. Project expenses (yen)

Total project cost: 131,962,126

FY1998:	23,056,885	(actual)
FY1999:	42,823,241	(actual)
FY2000:	66,082,000	(budgeted amount)

5. Summary of the report

This report summarizes the activities and findings of the New Development Patterns Project (NDP) during the first phase of IGES research.

The aim of the NDP Project is to explore new patterns of development in order to arrive at societies with sound material cycles, focusing particularly on Asia and the Pacific. This project was carried out in line with the basic objectives of IGES, working in close collaboration with the five other ongoing projects.

The objectives and targets and the main results of the first research phase were:

(1) To study and identify relevant issues to be considered in searching for “new development patterns.” Based on the study, a book entitled “Environment in the 21st Century and New Development Patterns“ was published.

(2) To share the outputs with the general public as well as with experts outside. To this end, various workshops and open forums were organized.

(3) To contribute to international policy consulting forums by submitting documents and giving keynote speeches and reports in order to incorporate the idea of “new development patterns“ into practical policies. Based on the results of ECO ASIA Long-term Perspective Project, IGES submitted policy as well as background documents to ECO ASIA

1999, ECO ASIA 2000, and ESCAP/MCED. The representatives of IGES made keynote speeches and presentations in these meetings.

(4) To select a few topics out of the issues clarified in (1) and to start more detailed studies. The topics studied included (a) Transfer of Environmentally Sound Technology (b) Business and Environmental Governance and (c) Information Technology and Environment. The result of the study on transfer of environmentally sound technology was compiled in a report and a booklet on practical examples of technology transfer and cooperation. The result of the study on business and environmental governance was published in book form.

(5) To identify topics to be further studied in the second research phase. The topics identified for the second phase to follow up the results of the first phase include, among others, continuation of the study related to ECO ASIA, further study on specific topics such as business and environment as well as IT and environment, and preparation of the White Paper on the Asian Environment and Development.

6. Keywords

New development patterns, information technology, environmentally sound technology, ECO ASIA, ECO ASIA Long-term Perspective Project (LTPP), ESCAP, business and environmental governance, globalization, intergenerational equity, Rio+10, strategic environmental investment, policy integration, material-intensive production and consumption patterns

1. Introduction

Economic growth after World War II was made possible through the rapid expansion of the use of natural resources and energy, and growth in economic and social systems. These had the effect of accelerating patterns of mass production, mass consumption and mass disposal. However, the expansion of industrial activities and their supporting economic and social systems spread unevenly over the globe, concentrating in Western Europe, North America and Japan. Many regions of the world remained unable to enjoy the fruits of economic growth. Even today, the economic gap between developed and developing countries is widening. Moreover, it is becoming increasingly apparent that current development patterns followed by industrialized countries are causing serious environmental problems and that they are neither ecologically, nor socially sustainable. The limits of the ecological carrying capacity of the Earth are becoming apparent.

In recent years, many Asian developing countries, which have suffered from poverty for decades, are experiencing high rates of economic growth by introducing material-intensive production and consumption patterns based on throw-away products. The accelerating trend of globalization and the fast development of information technology enhance the problems associated with current development patterns on a global scale.

Society as a whole is facing critical challenges today. How can we transform existing economic and social systems into more environmentally friendly and sustainable ones in order to realize ecological sustainability and social equity? The answer is that we must identify and put into practice new development patterns for the twenty-first century, in both developed and developing countries.

Agenda 21, adopted at the Earth Summit held at Rio de Janeiro in 1992, presented a comprehensive action plan for a sustainable society in the twenty-first century. In particular it sought to eliminate poverty as well as to facilitate a paradigm shift, from the present development path which is based on the wasteful use of resources, to a more sustainable one (UN, 1992). In order to realize the paradigm shift, the methods for putting the agenda into practice must be clarified, and analytical research is needed to suggest strategic policies and to bring them about.

In order to curb damage to the environment, and to remove structural problems, developed and developing countries must together establish new development patterns (NDP). These patterns should encourage both consideration for the environment and sustainable development.

The new development patterns that IGES is seeking have a global perspective, but focus particularly on Asia and the Pacific region. This focus is partly due to IGES' own original reasons for coming into existence. It also reflects the fact that Asian countries such as China, India, ASEAN countries, Korea, and others will be critical in providing solutions to global environmental problems in the twenty-first century, because of their huge populations and continuing rapid economic growth. The development paths that these countries choose to follow from now on will greatly influence their impact on the environment. The ability of many of these countries to enjoy the benefits of their development will be undermined by the rapid changes they are undergoing and the economic and social distortions and weaknesses which these changes will bring. In contrast to the overemphasis on economic aspects of society, which is a one-way path of over-consumption of resources, the world is in dire need of another path that turns toward new development patterns. In order to create this new path, joint efforts of the countries and research institutes are necessary.

In order to tackle such an enormous theme, it is important to first clarify the kinds of issues that exist. It is also important to work in relation with domestic as well as international policy-making/consulting processes in order to put the idea of new development patterns into practice.

Certain high-level international policy consultation forums focus on the Asia-Pacific region, such as ECO ASIA (Environmental Congress for the Asia and the Pacific) and ESCAP (United Nations Economic and Social Commission for Asia and the Pacific). It is important to schedule research activities so that outputs will be provided to the

policy-makers and reflected in the future directions of development and change the region.

The NDP Project was called upon to play such a role, including presentations and policy recommendations made at ECO ASIA and ESCAP meetings, utilizing outputs from collaboration with other IGES projects.

(Kazuo Matsushita)

2. Report of the first phase project activities

2.1 Objectives and targets

The aim of the NDP Project is to explore new patterns of development in order to arrive at societies with sound material cycles, focusing particularly on Asia and the Pacific region. This project was carried out in line with the basic objectives of IGES, working in close collaboration with the five other ongoing projects.

The objectives and targets of the first research phase were:

(1) to study and identify relevant issues to be considered in searching for "new development patterns,"
(2) to share the outputs with the general public as well as with experts outside of IGES,
(3) to contribute to international policy consulting forums by submitting documents and giving keynote speeches and reports in order to incorporate the idea of "new development patterns" into practical policies,
(4) to select a few topics out of the issues clarified in (1) and to start more detailed studies (these topics studied included (a) Transfer of Environmentally Sound Technology (b) Business and Environmental Governance and (c) Information Technology and Environment), and
(5) to identify topics to be further studied in the second research phase.

a. Issues relating to New Development Patterns

In order to identify and clarify various issues relevant to the concept of new development patterns, a couple of brainstorming sessions were held in the autumn of 1998 with the participation of experts, including some IGES trustees and board members.

The following are some of the points made at the brainstorming sessions:

- There is a need for renewed investigation into the connection between economic growth and environmental preservation.
- Reassessment of "market economies" is necessary. The market mechanism has limitations in safeguarding the environment and providing social common capital stock.
- How should the connection between globalization and sustainable development be assessed? One of the possible effective measures to cope with the present trend may be a decentralized, local initiative network. For example, establishment of an energy farming culture, an independent distributive water supply using rainwater, and sustainable agriculture.
- How should we consider national interests, corporate interests, global interests and human interests under the nation-state framework?
- How can we maintain equity between generations, i.e., intergenerational equity?
- How can scientific and technological activity be guided by social considerations?

When it was first considered necessary for the various issues relevant to new development patterns to be addressed, experts from Japan and abroad, including IGES directors and trustees, were requested to write papers. The issues selected are based on the points raised at the brainstorming sessions as well as points made at meetings of the board of directors and trustees. The inclusive and crosscutting nature of this project was also taken into account.

The issue papers were submitted for a workshop held on 29-31 January 1999. These papers were revised where necessary, and later were compiled, edited and published in a book called "Environment in the 21st Century and New Development Patterns," which was published by Chuo Hoki Publishing Co., Ltd. in November 1999 in Japanese, and by Kluwer Academic Publishers in English in December 2000.

During the process of identifying issues for new development patterns, special attention was given to make sure that linkages with other five strategic research projects be considered and that their results be used.

Along with the efforts to identify issues relevant to new development patterns, the following sub-themes were selected and more detailed studies were conducted for each topic.

b. Transfer of environmentally sound technology

A commissioned study was conducted with the aim of identifying strategies for the development of concrete methodologies for the transfer of environmentally sound technology. The study was conducted on the basis of experiences gained by aid agencies such as the Japan International Cooperation Agency (JICA) in their activities in developing countries. It also aimed to develop future directions of aid to developing countries in the international framework.

Three study sessions were held with experts from various fields in environmental technology cooperation. The results of these were disseminated to the public by holding an open forum discussion. The report of the study and the forum were printed together with a booklet describing practical examples of technology transfer and cooperation.

(Kazuo Matsushita)

c. Intellectual input into ECO ASIA, with special reference to the Long-Term Perspective Project as well as ESCAP/MCED

The NDP Project worked closely with high–level international policy consultation forums such as ECO ASIA (Environment Congress for Asia and the Pacific) as well as ESCAP, particularly ESCAP/MCED (Ministerial Conference on Environment and Development in Asia and the Pacific held in September 2000). ECO ASIA was established primarily by the Environment Agency of Japan in 1991 and continues as a regional forum in the Asia-Pacific region for high-level policy-making officials, including those at the cabinet level.

IGES has acted as a think tank for this congress since 1999, particularly in relation to the Long-term Perspective Project (LTPP) under the framework of ECO ASIA.

The LTPP project was initiated in 1993, with the aim of projecting future trends of environmental and developmental issues in the region and providing policy proposals to attain sustainable development. The first phase of the project was completed in 1997 with the publication of the “Final Report of ECO ASIA Long-term Perspective Project, 1997.” The report presented four central concepts to promote regional cooperation for sustainable development, namely, eco-consciousness, eco-partnership, eco-technology/eco-investment, and eco-policy linkages.

The second phase of the LTPP project started in 1998. Further elaboration of the four concepts as well as ways of linking and applying these concepts into specific areas of concern such as climate change, urban environment, forest conservation, and environmental education are being pursued.

The NDP Project provided input into ECO ASIA ’99 (held 4-5 September in Sapporo) with the collaboration of other IGES projects. Mr. Matsushita, NDP Project leader, presented a keynote speech, entitled “Asia-Pacific Region in the 21st Century—Building a Sustainable Society.” The NDP Project also provided input to ECO ASIA 2000 and ESCAP/MCED 2000 (both were held in September in Kitakyushu City).

IGES prepared documents entitled “Policy implications in addressing critical environment and sustainable development issues of the region” and “Specific issues on sustainable development in Asia and the Pacific,” which were submitted to the Preparatory Meeting of Senior Officials of ESCAP/MCED for information and discussion, and then reported to the MCED.

At ECO ASIA 2000, Mr. Matsushita delivered a progress report on Phase 2 of the ECO-ASIA Long-term Perspective Project. He described current trends in the Asia-Pacific region and highlighted the key issues concerning the establishment of sound policies for sustainable development.

(Kazuo Matsushita, Takashi Otsuka)

d. Business and environmental governance

Through the comprehensive surveys to develop the approaches for new development patterns conducted in the first year, we have realized the need to study some topics more in detail. One of them is Business and Environment.

In the past, developing and implementing policy for improving the environment was thought to be primarily the responsibility of government. However, as is typically seen in global environmental and waste problems, the actors whose activities cause environmental problems are business and citizens. Thus, without positive actions by these actors, environmental problems cannot be solved. Every actor, including governments, businesses, citizens, and non-governmental organizations (NGOs) should take actions to establish environmentally sound and sustainable societies.

The business sector in particular, through corporate activities such as production, distribution, sale, use, consumption, and waste generation, causes a great impact on the environment, while at the same time it has the potential to improve the quality of the environment.

Japanese industry caused serious pollution problems during the nation's post-war recovery and rapid economic growth. While the private sector has discharged various materials into the environment and caused pollution, more recently it has contributed to overcoming pollution, by complying with the standards set, by concluding pollution control agreements with local governments, and by developing pollution-control technologies, etc. Japanese pollution-control policy would not have been successful without the efforts of the industrial sector.

Recently, the private sector is taking a more positive approach to cope with current environmental problems, such as setting voluntary targets to reduce waste problems and global warming, gaining ISO certification and making environmental reports.

It is vital to improve Japanese and Asian environmental governance in the future by studying the experiences and influences of business activities on policy-making processes, starting with pollution controls in the 1960s.

The NDP Project conducted a detailed study through a study group on Business and Environmental Governance. The results of the study were published in a book, entitled "Business and Environmental Governance." The project also conducted study on environmental reporting and environmental performance indicators through participation in Global Reporting Initiative workshops entitled "Study Group on Environmental Performance Indicators," "Study Group on Environmental Reporting Guidelines," and "Environmental Reporting Network."

(Rie Sugiyama)

e. Information technology and environment

The digital (information technology, or IT) revolution currently underway is likely to accelerate further. It is characterized by the rapid growth in the use of computers, the Internet, cellular phones, electronic commerce, videoconferencing, geographic information systems, and remote sensing, etc. Further advances and the diffusion of information technology have the potential to drastically change the economic and social systems of today by reducing the amount of material and energy used by industries, shifting from the transportation of goods to transfer of information by telecommunications, and increasing the volume of electronic commerce, as well as leading to many other changes in societies and economies. The Asia-Pacific region is no exception to the growth of IT.

However, the question of how the digital revolution affects the environment—one of the greatest concerns for humanity in the twenty-first century—has received only limited attention to date.

What are the environmental implications of the further use of information technologies, and how will they change in the future? Information technologies and their applications may substantially reduce energy and resource consumption, and

lead to a decrease in greenhouse gas emissions. In addition, environmental monitoring and modeling through the use of information technologies may help achieve better environmental management and policy choices. Yet, the effects can be the opposite—construction of an information technology infrastructure is energy- and resource- intensive, and the environmental impacts of the production, use, and disposal of digital technologies must be taken into account. Information technologies also accelerate overall economic activity through high-speed information access and exchange, resulting in greater consumption of energy.

What policies should be implemented to utilize information technologies for sustainable development in the digital era? What implications do the experiences of "digitally advanced" countries like the United States, the Scandinavian countries, Singapore, and Japan present to countries in Asia and the Pacific?

In the fall of 2000, the NDP Project began preparations to launch research to attempt to answer these questions. The planned research on information technology and the environment aims to examine the present state and future trends of the positive and negative impacts of information technologies on the environment, and to draw up desirable policies that make the best use of information technologies for environmental conservation. The research will place special emphasis on exploring lessons and implications for Asian and Pacific nations.

(Shuzo Katsumoto)

2.2 Outline of research results

a. Issues on New Development Patterns

Methodology

First, a literature survey was conducted in order to identify issues and relevant materials for new development patterns. Then three study sessions were held on the issues of new development patterns in FY 1998. Following the discussions in the sessions mentioned above, members from the group as well as some of the Board members of IGES were asked to submit issue papers for a workshop held 29-30 January 1999.

The issue papers submitted at the workshop were revised where necessary, and have been compiled in a book called "Environment in the 21st Century and New Development Patterns," which was published by Chuo Hoki Publishing Co., Ltd. in November 1999 in Japanese, and by Kluwer Academic Publishers in English in December 2000.

An open forum discussion entitled, "Japan-U.S. Forum on Environmental Issues," was held jointly with the Japan Foundation Center for Global Partnership on 2 August 1999 in order to share ideas with the public on the issue of new development patterns. Also, in commemoration of the publication of the Japanese edition of the book "Environment in the 21st Century and the New Development Patterns," a public forum was held by IGES on 9 December 1999, with the participation of some of the authors.

Findings and analysis

Findings and analysis of issues relating to new development patterns were compiled and presented in "Environment in the 21st Century and New Development Patterns." In the book, an introductory chapter by Kazuo Matsushita entitled "Asian Environment and New Development Patterns" is followed by three categories of papers. The first category focuses on specific areas such as energy, water, and agriculture. The second category is written from the point of view of a specific country or region. The third category develops awareness of the problems that have general application to new development patterns. Below is the outline of the book, followed by a summary of the essence of each section.

Section 1 (New Development Patterns in the 21st Century Society) includes the following:

- Chapter 1 “Environmentally Conscious Market Economy Formation and Materials Cycle” by Tadahiro Mitsuhashi
- Chapter 2 “New Development Patterns and Energy” by Haruki Tsuchiya
- Chapter 3 “New Economy and Energy” by Haruki Tsuchiya
- Chapter 4 “The Economic Challenges of New Development Patterns: Impact of the Information Technology Revolution” by Yasuhiro Murota
- Chapter 5 “The Role of Information Disclosure in Corporate Governance – The Case of the Chemical Industry” by Cindy Termorshuizen
- Chapter 6 “A Sustainable Water Strategy for New Development Patterns” by Makoto Murase
- Chapter 7 “Movement Toward Sustainable Agriculture and Development” by Takeshi Hara

Section 2 (New Development Patterns and Regionality) includes the following:

- Chapter 8 “New Development Patterns in Asia” by Shinji Fukukawa
- Chapter 9 “New Development Patterns in India” by Hari Srinivas
- Chapter 10 “New Development Patterns and the Innovation in China’s Environmental Policy” by Zhang Kun and Xia Guang

Section 3 (New Development Patterns and International Development) includes the following:

- Chapter 11 “International Development on the Eve of the 21st Century” by Keith Bezanson
- Chapter 12 “Enjoy it by Giving it up – Towards Sustainable Development Patterns” by Kirit Parikh
- Chapter 13 “Development and Good Governance for the 21st Century” by Ryokichi Hirono

Recycling-oriented, decentralized and networking society

Section 1 introduces various issues, which are relevant to the realization of new development patterns. Each of the authors was requested to discuss separate themes and wrote independently. Naturally, the proposals and emphases in each paper reveal common elements in understanding of the problems. Below is a brief introduction of the papers.

Mitsuhashi’s paper starts with the recognition that the Earth has resource and environmental limits, and conditions are deteriorating. It proposes a “zero emissions” approach and the building of an environmentally-conscious market economy in order to shift from the current throw-away economy based on mass production, mass consumption and mass disposal to an economic system which is more recycling oriented and causes less burden on the environment. The paper then emphasizes, in developed countries in particular, a change from flow-based to stock-based economies. The image of the stock-based economy evokes the following key words: stable economic growth, appropriate production, long-lasting products, service-oriented manufacturing industry (focussing on the provision of service rather than provision of physical products), domestic demand oriented, and decentralization.

Tsuchiya’s first paper proposes increasing the efficiency of energy use, a move towards decentralized energy systems, a shift from being an energy “hunting” civilization to an energy “cultivating” civilization, and the concept of a new economy with highly efficient use of energy and resources.

Tsuchiya’s second paper considers the possible energy-saving benefits of the New Economy, based on the revolution in information technology. The use of electronic mail, teleconferencing, telecommuting and other changes in the way we live and work have the potential to reduce the amount of energy needed in society.

Murota’s paper discusses the information technology revolution and global environmental problems. It suggests that, based on the IT revolution, industry will be able to move away from manufacturing, that communications will substitute traffic, and that through technological “leapfrogging” by developing countries, the load on the environment may be reduced.

Termorshuizen's paper argues that information disclosure programs and rules instituted in mechanisms of corporate governance work as driving forces to promote innovation, competitiveness, and environmental care. Taking the chemical industry as an example, the conditions to ensure such processes were discussed.

Murase's paper focuses on strategies relating to water resources and proposes moving away from dependence on river sources to independence, and from destruction of regional water cycles to symbiosis. It also discusses the idea of cyclical capacity, shifting from demand control to supply control, and the use of networks.

Hara's paper is based on a number of case studies. He stresses the concept of sustainable agriculture from the viewpoint of "material cycles," the coexistence of human activity with natural ecological systems, the joint participation of producers and consumers, and agriculture as the pillar to sustain regional communities.

The points of view that emerge from these papers promote self-sufficiency, autonomous approaches based on regional empowerment and networking, and societies that break away from materialism and manufacturing.

Development patterns in Asia: diverse and plural value systems

In Section 2, new development patterns in Asia were discussed in three different contexts.

Fukukawa's paper, based on analysis of the history of Asian development and value systems, proposes directions of efforts to restore the global environment, frameworks for sustainable development and possible international cooperation.

Srinivas' paper evaluates the impacts of economic liberalization, which took place in India during the early 1990s. It also summarizes the development patterns in India and presents future projections.

Zhang and Xia's paper reviews recent developments in Chinese environmental policies. It then considers the direction of policy innovations based on the concept of long-term sustainability of environment and resources.

These papers provide an Asian perspective and plural values to our discussion.

New concepts of development

Section 3 is composed of three papers on new development patterns, contributed by three experts on international development from one developing and two industrialized countries.

Bezanson's paper looks at the past and the present of international development. It proposes that we fundamentally reconsider the concept of "development" to accommodate changing international frameworks under the current trend of globalization. Under a new concept of development, it underlines the importance of region-specific diverse values and the carrying capacity of the environment.

Parikh's paper confirms that current development patterns are neither ecologically, socially nor politically sustainable. Based on that recognition, it then tries to identify desirable patterns of development, how to realize them, and the kinds of research required.

Hirono's paper lists areas that economic development and integration in the 1980s failed to address, such as equitable income distribution, elimination of poverty, and environmental sustainability. It then stresses the need for economic growth, which is compatible with social equity, sustainable development and good governance. In order to attain such objectives, it calls for drastic policy and institutional reforms as well as promotion of investment in human capital, science, and technology.

Currently, globalization is spreading and affecting societies around the world. The common theme of the authors of this section concentrates on how to realize sustainability under this reality. How should we identify new patterns of development which are different from existing ones? What kind of development patterns should be followed by Asian countries while combating poverty? The papers have identified the issues and orientations to approach the problems. However, further research will be required to make the ideas more concrete.

Concluding remarks

The result of this study is presented as a compilation of contributions of experts on various issues, which comprise of important ingredients for analyzing new development patterns, particularly in Asia and the Pacific. Certainly there is a long way to go to arrive at the final goal of the research on new development patterns. This attempt is but a preliminary study on this important subject.

The compilation of issue papers and their subsequent publications both in English and in Japanese stimulated wide ranging public debate on new development patterns. It has also helped to identify specific areas for future study, such as business and environment as well as IT and environment.

(Kazuo Matsushita)

b. Transfer of environmentally sound technology

This study was commissioned by the Environment Agency of Japan in FY 1998 in order to clarify how environmentally sound technology should be transferred, especially to “Least Among Less Developed Countries” (LLDCs). The survey aimed to investigate technologies that give consideration to the environment, and to identify priority areas of technology transfer for the future. In addition, this survey included analysis of Japan’s experience in supporting developing countries within an international framework. It aimed to clarify the tasks that need to be prioritized in order to carry out this sort of study, and development and transfer of technology.

The detailed outcomes of this study were compiled into two Japanese reports, and a booklet on “Practical Examples of Technology Transfer and Cooperation“ was prepared both in English and in Japanese.

Methodology

In this study, a study group was set up, consisting of experts covering a wide range of fields, and three study sessions were held. IGES researchers also carried out hearings with international institutions, governments, and NGOs in Europe and Asia in order to understand the current situation and future direction. Based on the outputs from the study group, an open forum on this topic was held on 26 March 1999. Experts from diverse areas, including NGO members, government officials, business executives and others related to this field, as well as those from the study group above, participated in the forum and took part in active discussions.

Issue papers provided and discussed by the experts and the dialogue of discussions were thoroughly reviewed and the key elements of successful technology transfer to/among LLDCs were identified.

Findings and analysis

What is an LLDC?

Countries which are particularly late in development are called “Least among Less Developed Countries” (LLDCs) in the study. The United Nations, however, defines them as “Least Developed Countries” (LDCs). LDCs are countries which meet the following criteria:

(1) GDP per capita 699 US dollars or less
(2) Manufacturing accounts for 10 percent or less of GDP

(3) Adult literacy is 20 percent or less

Forty-eight countries were officially categorized as LLDCs in the Aid Recipient Country List of the 1997 DAC chairman's report. Among the 48 LLDCs, 33 countries are in Africa. Seven countries are in Asia. Five of them are island-states in the Pacific region. Analysis by region reveals that over two-thirds of the LLDC countries are in Africa and the rest are in the Asian and Pacific region, except for three countries (two in the Middle and Near East and one in Latin America).

Different types of environmental problems

The environmental problems which developing countries face differ considerably depending on whether or not the country or region is experiencing a concentration of the population in cities. Differences also depend on the level of poverty and the severity of natural conditions which influence livelihoods. Since heavy industry has not yet developed in LLDCs, other than specific local industries, the environmental impacts of industry are relatively insignificant. An outline of representative environmental problems in LLDCs follows.

Environmental Problems Accompanying the Concentration of Population in Cities: The tendency of populations to migrate to cities has been worsening in many developing countries in recent years. In some cases the cities actually need labor, but a more common factor accounting for the growth of cities is that farmers become unable to survive as farming areas become impoverished and people from these areas rush into cities where they hope to make a living. When this happens, large slums often form within cities. The migration to cities leads to environmental problems relating to water and air pollution and waste management.

Environmental Problems in Agricultural Countries or Regions: Soil deterioration, soil runoff and forest destruction have become major environmental problems in agricultural countries and regions. Examples exist of contamination of drinking water caused by agricultural chemicals and fecal matter from animal husbandry.

Environmental Problems in Poverty-Stricken Countries or Regions: The lack of water resources is a major factor in environmental problems of poverty-stricken areas. In addition, many natural areas are being destroyed by local inhabitants who fell trees for fuel for their livelihood. It is an important task to secure water for safe drinking, for washing and for agricultural uses (including livestock).

Environmental Problems in Island Countries: In small island countries, poverty is generally not severe because the vestiges of self-sufficient economies remain. However, different problems with water resource security, water pollution and hygienic waste disposal have appeared due to population increases. In island countries which depend particularly on tourism, an important task is determining how to deal with waste disposal hygienically on the limited land area. In addition, many islands are facing the threat of submergence due to rising sea levels caused by global warming.

Groundwater Pollution: Groundwater is a valuable source of water for drinking and agricultural uses in many countries and regions including LLDCs, but recently there have been many reports of groundwater pollution caused by arsenic, which has an impact on public health in developing countries. The population estimated to be in danger of arsenic poisoning increases with every new investigation: the estimated number of people threatened has risen to over ten million, an unprecedented number of people threatened by one substance. It is difficult to identify the various factors leading to water pollution by arsenic, but it is speculated that in many cases groundwater is influenced by large-scale agricultural irrigation and mine development. Even though arsenic is a naturally occurring substance, the cause of the pollution is closely connected to production activities by humans.

Difficulties in addressing environmental problems

Among developing countries, LLDCs face particular difficulties addressing environmental problems because they have serious shortages of funds, technologies and human resources. Regarding funds, although developed countries provide

grant aid for infrastructure development to solve these problems, the recipient countries often do not have sufficient funds to maintain or manage the facilities provided through aid. Regarding technologies, it is difficult to utilize them unless their costs are low and they are easy to use. A lack of adequate laws and personnel adds to the difficulty in addressing environmental problems.

Purpose and key factors of technology transfer and cooperation

In the study, the focus is on technology transfer and cooperation for the Least among Less Developed Countries and regions. Special target areas are farming, fishing and mountain villages rather than cities, where livelihoods are based on primary industries such as agriculture, and greatly depend on the local environment. The primary purpose of technology transfer and cooperation for these countries and areas is to improve livelihoods while preserving the environment by maintaining the local natural environmental conditions.

Therefore, an important question is whether or not it is ideal to pursue economic development through similar processes employed by many industrialized countries, i.e., European and the American models. If all of humanity pursues economic development based on mass production and consumption, environmental loads will continue to increase. Rapid introduction of such a developmental model would threaten traditional cultures and social systems that have survived until now in each country and region. There is also the fear of the destruction of primary industries such as agriculture, which developed in harmony with local natural conditions and ecological systems, and thereby destruction of agricultural lifestyles. Making the entire world homogeneous using such a model is not the purpose of aid, and technology transfer and cooperation.

For the application of technology transfer and cooperation with LLDCs and regions, the following guidelines should be considered while keeping in mind the perspectives noted above.

- Respect local people's desires and aspirations.
- Respect characteristic local culture, traditions and social systems.
- Contribute to the improvement of local livelihoods without ignoring their sense of self-reliance and self-help.
- Implementation should be gradual, respond to actual situations and changes in local societies and economies, and avoid causing abrupt changes.
- Respect the human factors such as face-to-face/direct communication with other people.

Conclusion

Regarding Environmentally Sound Technology which should be employed in developing countries, definition and transfer methods are detailed in Chapter 34 of Agenda 21 of the United Nations which was agreed upon at the Earth Summit (Rio Conference) in 1992. Environmentally Sound Technologies referred to in this paper are defined as those that "protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes" (Paragraph 34.1), and "in the context of pollution, 'process and produce technologies' that generate low or no waste, for the prevention of pollution. They also cover "end of the pipe" technologies for treatment of pollution after it has been generated."

The intention of the study is to identify technologies corresponding to the above definition which are currently feasible or have future potential, excluding "end of the pipe" technologies. This means technologies which are low priced, easy to operate and maintain, and which can be maintained with available machinery and parts in recipient countries within local the technical and economic range of capabilities.

The view still exists that appropriate technologies are low in quality but this view must be corrected. From the point of view that they can sustain harmony between nature and human activities, they should be considered to be advanced technologies. In addition, consideration of appropriate technologies should not be limited to those from developed

countries, but also include indigenous technologies in developing countries or original technologies that were developed based on the actual conditions in those countries.

"Appropriate technologies" include utilization of water, irrigation, afforestation and decentralized energy technologies which are easily applicable in farming villages. Such appropriate technologies once existed in farming villages in what are now industrialized countries. However, much of this type of knowledge has been lost. In present-day industrialized countries, emphasis is placed on cutting edge technological development in the face of competition among advanced industrial nations. In industrialized countries, not enough attention is paid to examination and development of appropriate technologies aimed at applications in developing countries.

If consideration is given to technology transfer and cooperation for developing countries, it is necessary to adequately examine and reconsider the content of target technologies which should be developed. For example, it has been argued that biomass can provide most of the new predicted energy demands in developing countries. If this becomes a reality, it is possible that new technology will be introduced by developing countries earlier than by developed countries. For developed countries, the shift to new technology systems may be delayed; the massive investments to install infrastructure in these countries may ironically become obstacles to change. A good example to consider is the wireless or mobile telephone. In Southeast Asia, the use of these telephones has spread rapidly because the necessary infrastructure costs much less than standard telecommunication systems thanks to the use of new technologies. Similar changes could occur with various other technologies, such as electrical power and sewerage systems. In other words, in the future developing countries may have new opportunities to choose between technologies requiring large-scale intensive infrastructure or small-scale decentralized technologies.

Industrialized countries have excellent technologies to combat pollution, but these technologies can only be fully effective in limited areas in a limited number of countries already on the path toward industrialization. Even in these cases, it is important that the technologies have low operating and maintenance costs. Considering the actual conditions in many developing countries, it can be said that technologies unknown in industrialized countries, and technologies which used to exist in industrialized countries but have been lost, can play major roles. Future technology transfer and cooperation should be for basic human needs, agriculture, forestry, seek to serve traditional agricultural societies and create better modern industrial societies, and not just be limited to promoting more industrial production. It must be noted that these technological changes have important meaning for advanced industrial countries when trying to create new development patterns and sustainable societies in the twenty-first century.

(Takashi Otuska)

c. ECO ASIA, ESCAP/MCED

In order to attain the objectives of the NDP Project, it is important to contribute to various international policy consulting forums. Among them are ECO ASIA (Environment Congress for Asia and the Pacific) and ESCAP/MCED (Ministerial Conference on Environment and Development hosted by United Nation Economic and Social Commission for Asia and the Pacific). Thus, targeting high-level international forums for environment and development issues, such as ECO ASIA and ESCAP/MCED, we have prepared several policy recommendation papers. The message of these papers consists of an overview of environmental and developmental trends, key concepts for sustainable development, effective and successful countermeasures that have been/need to be taken, and recommendations, etc. They were presented in the conferences shown below through keynote speeches, resource person's presentations, background documents, etc.

Methodology (processes)

Identifying critical environmental issues in the regions, (i.e. climate change, urban environmental management, forest conservation, environmental education, and regional cooperation), overviews and the latest research outcomes on each issue provided by the relevant IGES research projects were synthesized into policy recommendation documents. The

overall trend of environmental change in the region and future perspectives provided by the Asia-Pacific Integrated Model team of the National Institute for Environmental Studies were reviewed and compiled into the documents as well.

Environmental consciousness was also identified as the fundamental basis for enhancing partnership, environmentally friendly technology development and transfer, pro-environmental investment, and policy linkage to realize sustainable development in the region. These concepts were also incorporated into the integrated policy recommendation documents.

The annual international workshops of ECO ASIA and ESCAP Regional Review Meeting were identified as an opportunity for peer-review and to enhance the credibility of the messages. In these meetings, drafts of these documents were presented and discussed among scientists, policy makers and other stakeholders, and consequently they received constructive comments. Taking all the comments provided by a wide range of stakeholders into account, the documents were finalized and presented at the ministerial level key conferences on environment and development in the region.

The chronological order of our endeavors to prepare the policy recommendations is shown in the figure below.

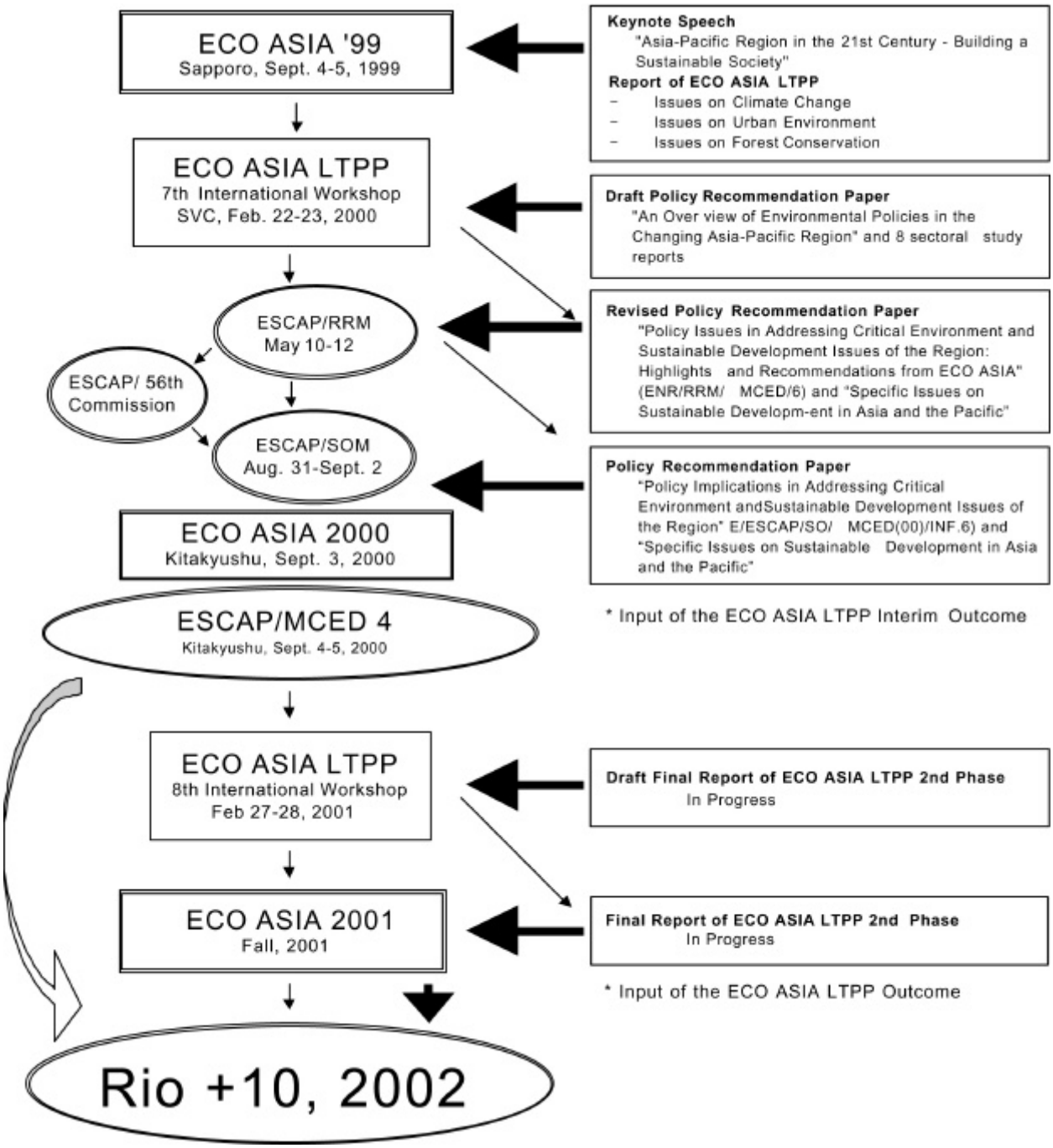

Figure 1. IGES inputs to international policy dialogue

Findings and analysis: brief review of messages to policy-makers

ECO ASIA '99 (4-5 September in Sapporo)

Following is the outline of the keynote speech: "Asia-Pacific Region in the 21st Century: Building a Sustainable Society," presented by Mr. Kazuo Matsushita at ECO ASIA '99.

Current Trends

i. Environmental trends in the Asia-Pacific region

The Asia-Pacific region is characterized by diverse ecosystems, including grasslands in the north, tropical forests in the south, and deserts in China. The region is facing various environmental problems: such as degradation of land and deforestation, industrial pollution, urban environmental problems, and water and waste problems. Also, rapid population growth and industrialization is taking place. Thus it is necessary to address various environmental issues simultaneously

Serious future environmental trends are projected. Increase in energy consumption will lead to increase in SOx and CO2 emissions. Land-use change will lead to a decrease in forests and bio-diversity, higher levels of greenhouse gases, more natural disasters, and shortage of water resources. Development without regard to environmental conditions will put the health of the people of the region at risk.

ii. Recent important environmental episodes in the Asia-Pacific region

The flooding of the Yangtze River in China caused 2,500 deaths and left 56 million homeless. The total cost of the damage is about 100 billion Chinese yuan (about 12 billion US dollars). The cause of the flood was not entirely natural. Damage was aggravated by forest and ecological destruction in both the middle and upper reaches of the river. The haze in South East Asia: Serious air pollution from haze caused by forest and peat fires in Indonesia in the second half of 1997 affected neighboring countries. Trans-border pollution requires regional cooperation. Urban air pollution such as in India: Air pollution in Delhi was aggravated. Major sources of pollution were fly ash from coal thermal plants and diesel exhaust from automobiles.

iii. New development of environmental governance in the Asia-Pacific region

Although the Asia-Pacific region is facing serious environmental problems, there are signs of new development in environmental governance. Upgrading of National Environmental Protection Agency (NEPA) in China: After a reform of the national governmental organization, the National Environmental Protection Agency was promoted to the State Environmental Protection Administration (SEPA). This shows that the Chinese government is paying much more attention to the environment and that unified and comprehensive supervision and management in environmental protection will be promoted.

The Indonesian Bio-diversity Foundation is another example. This foundation was formed in 1994 as part of a broad program of the Biodiversity Convention in Indonesia between the Governments of Indonesia, Japan and the United States of America. It carries out activities such as public awareness enhancement, and promotion of biodiversity conservation and sustainability through the empowerment of local communities.

The other notable initiative is the launching of preparatory activities of the Acid Deposition Monitoring Network in East Asia (EANET). EANET's preparatory activities were initiated in April 1998 at the Acid Deposition and Oxidant Research Center in Niigata, Japan. It aims to create a common understanding of acid deposition problems among countries in the region through the implementation of monitoring, central compilation, analysis and evaluation of data,

and the periodic publication of reports.

iv. Environmental implications of the financial crisis in East Asia

The East Asian financial crisis that occurred in 1997 has affected virtually every aspect of life in the region, including the environment. For example economic contraction resulted in reductions in air pollution. On the other hand, fragile ecosystems were threatened due to expanded activities of logging, fishing and mining, which were intended to support the rural poor and generate export earnings. Reductions in the operation of wastewater treatment facilities, increase in untreated water, and increase of illegal dumping of waste were also reported. In some countries, the budget for environmental management was slashed. Overall, existing trends of "directing benefits of economic growth into the environment" were reversed and the risk of environmental neglect is growing.

However, the process of planning and implementing economic recovery programs presents an opportunity to realize cleaner, greener, and healthier economic development. There is a need for revitalizing the economy through strategic environmental investment and infrastructure building.

Policy Direction

v. Strategic environmental investment and environmental infrastructure

The period of economic stagnation provides an opportunity to stimulate domestic demand through pollution control and energy- and resource-saving investment, and to create new industries, as well as to lay the foundation for sustainable development. In this process, the following points should be considered:

- localization of eco-industry,
- promotion of environmentally friendly investment in infrastructure, such as waterworks, sewerage, waste treatment, and energy-efficient public transport, and
- promotion of investment in energy conservation and efficiency improvement.
- Strategic environmental investment and infrastructure building will ensure international competitiveness in the future.

vi. Effective environmental policy and policy integration

In most developing countries, local environmental problems such as air pollution from SOx and NOx, and securing of clean water are most urgent. Global environmental issues have a relatively low priority in these countries.

Dealing with global and domestic issues simultaneously could be an opportunity to improve policy efficiency. Experiences in industrial countries have shown that energy efficiency improvement measures are effective both in improving local air pollution and reducing CO2 emissions. International efforts to reduce green house gases could be linked to measures by developing countries to reduce local pollution.

For this purpose, financial and technological mechanisms to promote such activities should be strengthened.

vii. Ensuring conditions for effective environmental policy reform

In order to ensure effective environmental policy reform, following points should be taken into account:

- proper incentive systems and internalization of external costs
- securing financial resources
- strong legal frameworks and implementation mechanisms
- information disclosure, environmental education and public participation
- cooperation with the private sector

- building technological and institutional capacity
- a cooperative international framework based upon mutual trust

viii. Environmental cooperation for peace making—forging a cooperative international framework based upon mutual trust

In the Asia-Pacific region, efforts should be made to promote environmental cooperation for peace making, bearing in mind the following objectives:

- To contribute to stability and peace in the Asia-Pacific Region
- To forge and strengthen various regional environmental cooperative relationships
- To identify possible areas of cooperation, such as acid rain control, marine environment protection in the North-West Pacific, climate change, urban environmental management, forest conservation, etc.

Toward Rio+10

ix. Rio+10 and the role of ECO ASIA

ECO ASIA hopes to target the Rio+10 Conference to propose concrete strategies to transform the global society into a sustainable one. In the preparatory process of the Rio+10 Conference, the following points should be considered.

- To work in cooperation with the ESCAP Environment Minister's meeting scheduled for the autumn of 2000
- To propose policy packages for sustainable development with a focus on the Asia-Pacific region
- To promote policy dialogue on global environment
- To share awareness of major issues on environment and development in the region, to exchange information on effective measures, and to examine ways and means to promote international cooperation
- To promote further technology transfer and cooperation as well as financial cooperation

Note: The key-note speech was followed by presentations by three IGES project leaders who gave policy recommendation presentations on critical issues, i.e., Climate Change (Dr. Shuzo Nishioka), Urban Environment (Dr. Hidefumi Imura), and Forest Conservation (Dr. Makoto Inoue).

ECO ASIA 2000 and ESCAP/MCED 2000 (31 August – 5 September in Kitakyushu)

The following is the outline of the conference document (policy recommendation paper) "Policy implications in addressing critical environment and sustainable development issues of the region" (E/ESCAP/SO/MCED(00)/INF.6) accompanied by a detailed discussion paper "Specific issues on sustainable development in Asia and the Pacific."

Major environmental, social and economic trends in Asia and the Pacific

i. Economic trends and their impacts on the environment in the region

The 1997 East Asian financial crisis triggered dramatic economic contraction in Asia and the Pacific. The recovery from the sharp regional recession seemed to begin in late 1998. This financial crisis affected virtually every aspect of life in the region. The environment was no exception. The financial and environmental crisis had common roots: the pursuit of rapid growth without consideration of proper safeguards, policies and controls. However, in the process of economic recovery, the Asian countries must shift their development paradigms towards environmental sustainability and lay the foundations for cleaner, greener and healthier economic development.

ii. Population and poverty

The Asia and the Pacific region is densely populated, holding approximately 60 percent of the world's population (some 3.6 billion people in 1998), on only 30 percent of the world's land area. The population in the region is expected

to reach 4.8 billion by the year 2025 and 5.3 billion by the year 2050. Also, drastic social change has increased inequality in the distribution of wealth. Consequently, poverty still remains a significant problem in the region, particularly in South Asia.

Population growth increases pressure on environmental resources. The pressure is intensified when combined with poverty. Some large cities in the region have been struggling with urban environmental problems such as air and water pollution, unavailability of safe drinking water, traffic congestion, and increases in solid municipal and industrial wastes. In order to break the vicious circle of population growth, poverty and environmental degradation, these issues must be addressed as interrelated problems.

iii. Critical environmental trends

Fresh water availability per capita in some of the countries in the region is projected to decrease, meaning that shortages of fresh water will become increasingly severe over the next five decades. It should be noted that a widely accepted threshold for sufficient supply of water is 1,600 cubic meters of renewable fresh water per capita per year. When fresh water resources fall below 1,000 cubic meters per capita per year, countries experience chronic water scarcity.

The AIM (Asia-Pacific Integrated Model) forecasts, under both the high and low growth scenarios, that a large amount of GHGs will be released from this region over the next four decades. The energy consumption in the region now accounts for just over 20 percent of world energy consumption, which will increase to more than 30 percent.

The urban population in the region has doubled from 700 million in 1980 to 1.4 billion in 2000. The number of mega-cities (cities with a population of 10 million and above) in the region increased from three in 1980 to 12 in 2000 out of 20 world's mega-cities. They are projected to increase to 18 by 2015.

The forests in Asia and the Pacific declined significantly, both in terms of area and quality. Fifty percent of the region's forest base has already vanished. Between 1990 and 1995, 3.6 million ha of forests were lost each year. The total forest area lost during this period is equivalent to half the size of Japan.

Key elements in shifting to new development patterns

In order to realize sustainable development in the region, i.e. to build a resource recycling-oriented society, the following elements need to be pursued.

(1) Strategic Investment: The economic recovery process presents an opportunity to shift development patterns, thus strategic environmental investment and infrastructure building should be used to increase environmental as well as economic efficiency.
(2) Policy Linkage: Under the financial and technological constraints common in many countries in the region, an integrated policy approach that simultaneously addresses local and global environmental issues is important.
(3) Partnership: Promotion of private and public partnerships is essential.
(4) Environmental Consciousness: In order to enable these actions, promotion and enhancement of environmental consciousness is essential.

Conclusions and recommendations

(1) Asia-Pacific countries are experiencing rapid changes in economic and environmental conditions. Population growth and poverty still remain significant problems. Trends in land use, energy consumption and urbanization indicate serious threats to environmental sustainability. Because these items are linked to each other, population, poverty, and environmental issues need to be addressed in an integrated way. An integrated approach is an imperative.
(2) The financial and economic crisis that occurred in 1997 forced a re-evaluation of past development performance and patterns. The process of economic recovery presents an opportunity to lay a foundation for more

sustainable development. The economy should be revitalized through strategic environmental investments and infrastructure building. New approaches should be explored to improve policy efficiency and to create new flows of funding and technology. These flows can be created through, for example, BOT (Build, Operate and Transfer) and CDM (Clean Development Mechanism) models.

(3) Private-public partnerships, such as the BOT scheme, in building urban and rural infrastructures that use environmentally sound technology transfer and investment, should further be studied and promoted.

(4) The CDM should be designed to maximize its potential benefits, while balancing the feasibility of the emissions reduction, transparency of the schemes, host countries' needs, and equity between investing and hosting countries.

(5) Building a resource recycling-oriented society is an important step towards achieving sustainable development, where closed-loop systems are shaped through recycling and re-use, as well as material/waste exchanges between industries.

(6) Research on structural analysis, participatory forest management, timber trade, and legal and administrative measures should further be promoted to develop strategies for conservation and sustainable management of forests in the region.

(7) Raising environmental awareness and promoting education for sustainability are fundamental bases for building a sustainable society.

(8) Cooperative regional and sub-regional environmental organizations such as EANET (Acid Deposition Monitoring Network in East Asia), NEASPEC (North- East Asian Subregional Programme on Environmental Cooperation), SPREP (South Pacific Regional Environmental Programme), SACEP (South Asia Co-operative Environment Programmes), and TEMM (Tripartite Environment Ministers Meeting (ROK, China, and Japan) should be further developed and strengthened, with a view towards contributing to building regional trust and stability.

(9) The Rio+10 special session of the United Nations General Assembly on the implementation of Agenda 21, scheduled to be held in 2002, will discuss directions to change the existing pattern of development towards a new twenty-first century-type sustainable pattern. What we are facing today is critical challenge of how to transform existing economic and social systems into more environmentally benign and sustainable ones in order to realize ecological sustainability and social equity. In other words, new development patterns for the twenty-first century, both for developed and developing countries, need to be identified and realized.

(Takashi Otsuka)

d. Issues for G8 Environment Ministers' Meeting

The World Summit for Sustainable Development (known as Rio +10) is scheduled for the year 2002, to conduct a comprehensive review on the implementation of Agenda 21 ten years after the first Earth Summit in 1992 held in Rio de Janeiro. Various discussions will take place in the preparatory process for the World Summit and consequently there is a need for accurate information on past international dialogue. In this context, the G8 Environment Minister's Meeting held in Okinawa (7-9 April 2000) was one important opportunity for international dialogue on sustainable development.

With this background, in order to prepare to deal with the growing needs of multiple stakeholders, the NDP team selected important topics relating to the environment and development that the international community needs to tackle cooperatively, studied past dialogue on these topics, examined the key issues, and invited IGES in-house researchers and others to come up with some recommendations as well.

Selected issues for research are (1) poverty and environment, (2) resource-recycling oriented society, (3) freshwater, (4) forests, (5) the global commons and United Nations reform, (6) environment and security, and (7) international financial institutions. We identified other issues such as climate change and biodiversity as also being important. However, they are not covered in this research since numerous reports have already been released on these issues by other experts. Our research outcome was published as "Important Issues related to Environment and Development:

Toward Rio +10" (available in Japanese only).

Methodology

The NDP team reviewed communiqués of past G7 and G8 summits and environment ministers' meetings, summaries of conferences hosted by United Nations bodies, ministerial board meetings of the Organization for Economic Cooperation and Development (OECD), and other international conferences. Outlines of the past dialogue, current status and problems, key points, and future directions of each selected issue are identified. In some cases the findings were formulated as recommendations.

Findings and analysis

A summary of the main issues identified through our analysis is provided below.

Poverty and environment

i. Assistance to less developed countries

Comprehensive and long-term perspective on assistance to less developed countries: It is necessary to establish an enhanced international monetary institution that could systematically manage the money flows of development assistance that are often conducted without adequate coordination, and could plan and conduct comprehensive environmentally friendly development programs responding to the needs of LDCs.

Examination of technology transfer programs: It is important to plan and conduct comprehensive development programs that can maximize the benefits for "latecomers." There is an urgent need to examine technology transfer programs to realize this.

Focus on Least among Less Developed Countries: It is important to strengthen the focus on LLDCs, and on assistance concentrating on their basic human needs and as well as economic infrastructure because these countries tend not to receive private investment. It is essential to encourage the self-help efforts of LLDCs and apply "20/20" programs, etc. (The "20/20 Initiative," sponsored by several United Nations organizations and the World Bank and adopted at the World Summit for Social Development in 1995, proposes that in order to achieve universal coverage of basic social services, 20 percent of budgetary expenditures in developing countries and 20 percent of aid flows should be allocated to basic social services.)

Ensuring fund amounts and qualitative enhancement of programs: The pledge to provide 0.7 percent of their Gross National Product (GNP) as official development assistance, made by developed/industrialized countries at the United Nations General Assembly in 1970, is rarely achieved.

ii. World Trade Organization (WTO)

Reexamination of trade rules: Liberalization of trade (and domestic economies) could worsen the problem of poverty in LDCs. It is important to take the circumstances of the environment and LDCs into account when trade rules are reexamined.

iii. Private investment

Utilization of Private Funds and Human Resources: Utilization of private funds and human resources is important. There is an urgent need to establish international guidelines for private investment that take the environment carefully into consideration. Enhancing and complying with OECD rules is also important.

iv. Population issue

Population Increase in LDCs: In order to control population increase, it is important to pursue the empowerment of women, equal rights and gender balance, and health services including family planning.

v. CSD and Agenda 21

Enhancement of the Review Process of the Implementation of Agenda 21 by the CSD: The Commission on Sustainable Development (CSD) needs to show strong leadership in order to alleviate poverty. This is noted in Agenda 21 but has not been put into practice successfully. Activation and utilization of the Global Environmental Facility (GEF), and other innovative fund mechanisms need to be further pursued. It is important to discuss how these monetary flows can be materialized.

vi. Realization of Köln Debt Initiative

Follow-up of Köln Debt Initiative on Debt Relief: Fast and effective implementation of Köln Debt Initiative is necessary. As a result of the proposed debt relief, it is expected that more funds would be invested appropriately into poverty alleviation programs in Heavily Indebted Poor Countries (HIPC) instead of being used largely for paying back debt and interest. This will break up the vicious circle of poverty and environmental degradation and set a course for sustainable development. Japan is the largest creditor nation amongst the G8 countries.

vii. Partnership

Participation in decision-making processes by various sectors: Governmental representatives from developed and less developed countries should not be the only ones to participate in the planning and decision-making processes of comprehensive development programs. People from various other sectors should also be allowed to participate, in order to achieve poverty alleviation and to conduct precautionary actions against environmental problems at the same time. It is essential to establish good partnerships and ensure participatory processes by inviting representatives from international institutes, scientists, women, NGOs, etc.

Resource recycling oriented society

i. Improvement in resource management

Minimization/recycling of waste: It is important to promote “the 3 Rs” (reuse, return, recycling) of resources and to actively explore industrial ecology.

Promotion of renewable energy development: It is necessary to advance technology development of renewable natural energy sources, before other limited sources are exhausted.

Efficient use: In order to achieve efficient use of limited resources, it is essential to aim at enhancing resource productivity and to produce longer-lasting products.

ii. Change of consumption/production patterns

Change of industrial structure: In order to build sustainable societies based upon resource recycling, it is important to strive for the further dematerialization of products and to make consumption and production patterns more service-oriented.

Change in consumers: It is crucial to support the progress of consumers’ green purchasing by establishing well designed eco-labeling and eco-funding schemes.

Change of producers: It is significant to promote the implementation of life-cycle assessments (LCA) and the

formulation of guidelines for environmental reporting and environmental accounting.

iii. Government initiatives

Institutional incentives: It is important to promote green taxes and to support voluntary environmental initiatives by industry.

Information: It is important to enhance people's environmental awareness by making an environmental balance sheet for each nation, and recognizing that developed countries are partly responsible for environmental degradation in developing countries.

Accountability: It is important that governments, as large-scale consumers, actively promote green procurement.

Freshwater

i. Determining the current status of freshwater resources

Although freshwater resource issues obviously exist, in many cases, nations affected by them have not been able to reach mutual agreements on countermeasures to address the issues. It seems there is little enthusiasm to tackle the issues, and thus measures are slowly and rarely taken.

ii. Promoting assessment of international freshwater resources

It is essential that a higher priority be placed on the assessment of resources. International funds should be applied and appropriate measures taken.

Urgent tasks to be promoted are data collection and analysis of water quality, and assessment of lakes and marshes.

iii. Increasing international assistance and enhancing coordination facilities among donor countries and institutions for freshwater resources

Increases in funds and enhancement of cooperative actions need to be thoroughly considered.

iv. Conservation of freshwater resources

Harmonious approaches with agricultural development (food security), urban development, industrial development, forest conservation, combating desertification, etc., are particularly important.

v. Promoting LDC actions by enhancement of capacity building, technology transfer, and international fund increases

Forests

i. International forest conservation regime after IFF

The vast majority of nations are passive when it comes to the adoption of a "Convention on Forests"; thus it has been almost impossible to achieve mutual agreements on this topic at the Inter-governmental Forum on Forests (IFF). International society needs to establish further international regimes beyond IFF.

ii. Timber trade and forest conservation (ITTO Year 2000 Objective, forest certification, and environment and trade issues)

The objective of International Tropical Timber Organization (ITTO) to have all traded tropical timber coming from

sustainably managed forests by the year 2000 was an important item. Timber trade issues were also a major item discussed in context of the Millennium Round of the World Trade Organization (WTO). For forest conservation, forest certification issues and environment and trade issues need to be discussed.

iii. Coordinating and ensuring the implementation of existing treaties (carbon sinks and protected area management)

Essential issues include carbon sinks, effective management of protected areas, and participation of local people, as they relate to biodiversity conservation.

iv. Assisting developing countries

There is a large gap between what developing countries request and what developed/industrialized countries offer to assist them in order to develop. Conventional assistance programs based on the viewpoint of developed/industrialized countries need to be reexamined.

The global commons and United Nations reform

i. Enhancement of UN functions relating to the environment

It is generally agreed that the United Nations Environmental Programme (UNEP) should be enhanced. The terms of reference for the Environmental Management Group (EMG) have been drafted and the process of realizing them needs to be further examined (in the United Nations).

Regarding the enhancement of the Global Environment Facility (GEF), subject areas limited to four sectors, operational efficiency of the fund, and the method to evaluate projects need to be examined.

Ways to integrate treaty secretariats need to be examined.

Non-governmental organizations (NGOs) play important roles in tackling global environmental problems. Capacity building of NGOs in developing countries and networking are particularly important. The United Nations' relationship with NGOs is an important item.

ii. The global commons

If agreement is reached that the United Nations as an international organization should have greater responsibility to deal with issues of the global commons, the target areas and range of global commons need to be determined.

Possible organizational frameworks for comprehensive trusteeship of the global commons.

- Reform of the Trusteeship Council (UN reform plan)
- Establishment of a new board of trustees (UNDP plan)

It is important that the idea of a comprehensive trusteeship of the global commons is widely shared by UN member countries, especially among North and South countries, and other stakeholders such as NGOs. Strategies to achieve mutual agreement need to be sought out as well.

iii. Coordination of environmental treaties

UNEP and the United Nations University have been working to identify and promote synergies between a number of international environmental treaties.

Fields and ranges of collaboration among treaties need to be examined.

Environment and security

i. Concepts of environment and security

The concept of "environment and security" varies from person to person depending on one's objectives. Therefore, for productive discussions, it is essential that the relevant parties clarify their objectives and concepts for the use of this term.

ii. Application of environment and security concept

A number of authors have analyzed the conceptual and empirical aspects of the concept of "environment and security." However its application in the actual policy context has not yet been examined extensively. The most popular interpretation of the term is that environmental conservation is important for preventing disputes caused by environmental problems. However, other applications or interpretations of the concept may apply in different contexts:

- International peace-keeping through environmental cooperation
- Strategic foreign policy centering on the environment
- Improving the priority of environmental issues in policy
- Early warning of problems relating to the environment

iii. Relevance with the global commons and United Nations reform

The environment, the communal property of humanity beyond national sovereignty, is in danger. The concept of "environment and security" could turn attention to the seriousness of environmental issues, while the concepts of the global commons and global governance can be interpreted as schemes to enhance measures to tackle the environmental issues in this context.

International financial institutions and environment

i. Deadline for settling common environmental guidelines

It was noted in the G8 Communiqué Köln in 1999 that G8 countries aim to complete common environmental guidelines for export finance agencies by the 2001 G8 Summit. Considering the fact that competitive export businesses and projects that have the potential to harm the environment are constantly arising, the deadline for setting the guidelines should be kept or even made earlier.

ii. Criteria for common environmental guidelines

It is necessary to examine the criteria for common environmental guidelines. It would be preferable to meet the World Bank Groups' standards, considered to be the most substantial at present. However, if agreement on this proves difficult, compromise should be sought in order to meet lower criteria that would make mutual agreement possible.

iii. Individual actions for setting environmental guidelines

Besides the effort of the Working Party on Export Credit Guarantees (ECG) of the OECD to settle common environmental guidelines, the export finance agencies of some countries have been working to establish their own environmental guidelines. Controversy exists as to whether individual country actions to set standards should be welcomed unconditionally, or whether those countries should be encouraged to adopt strict common guidelines.

(Takashi Otsuka, Shuzo Katsumoto)

e. Workshop on Asian Environmental Outlook

The NDP Project organized a regional workshop for the review of Asian Environmental Outlook 2001 (AEO) drafted by Asian Development Bank (ADB), and an open symposium entitled "Asian Environment and Development in the 21st Century," with the collaboration of the ADB on 20 and 21 September 2000. About twenty participants from academia, NGOs, aid organizations, and research institutes participated in the AEO workshop. Many comments on the AEO were submitted and intensive discussions took place.

For the open symposium, attended by more than 100 participants, three keynote speeches were given: "Introduction of the Asian Environment Outlook—Draft Environmental Policy" by S. Tahir Qadri, Senior Environment Specialist of ADB; "Summary of the Results of Eco-Asia and ESCAP/MCED" by Kazuaki Hoshino, Environment Ministry of Japan; and "New Sustainable Development Patterns for the Asian Region" by Kazuo Matsushita, Acting Vice President of IGES.

After these speeches, Wakako Hironaka of the House of Councilors, Tsutomu Tanaka of Chuo University, Satoru Matsumoto of Mekong Watch, and Tae Yong Jung of IGES joined the intensive discussions.

Objectives

The objective of AEO workshop was to compile comments on the draft AEO from Japan, the largest donor country for the ADB, in order to revise the draft for the final version. AEO was drafted to collect information on the current situation of Asia, obtained through financial and technical support activities, to analyze the factors bringing about environmental destruction, and to propose future policies for improving the environment in Asia.

The open symposium aimed at providing the opportunity to discuss measures to cope with serious environmental problems in Asia from different perspectives, such as governments of developing countries and donor countries, the private sector, NGOs, and international aid institutions such as the ADB, based on AEO 2001 and the results of ECOASIA and the ESCAP Environment Ministers' meeting in September 2000.

Results

The comments submitted to the AEO workshop were compiled and are expected to be incorporated in the final version of AEO 2001.

At the open symposium, the following were intensively discussed to develop systems to cope with Asian environmental problems precisely:

(1) Enhancing transparency and information disclosure
(2) Promoting capacity building of local governments in order to respond to their expanding roles
(3) The role of developed countries in technology transfers, etc.
(4) The need to improve systems for enabling NGOs to play more active roles in the policy-making process,
(5) Policy integration among development, poverty alleviation, finance, defense, and environmental policy

A close relationship between IGES and the ADB was established through the preparatory process for the workshop and the symposium.

(Rie Sugiyama)

f. Business and environmental governance

Publishing "Business and Environmental Governance"

The Environmental Governance Project of IGES established a study group called "Business and Environmental Governance" (Chairperson: Mr. Isao Iwabuchi) which consists of business people in charge of environmental

departments in various sectors, and studied the role of business in improving the environment in the past as well as in the present based on reports and discussions by members. The results of the study group were compiled and made public at the international workshop "Business and Environmental Governance" held 19 March 1999.

This report earned the reputation of being very useful to business. It includes business experiences on how to cope with pollution and environmental problems, evaluation of the influence of businesses on environmental policy, the influence of environmental policy on business activities, and the role of business for co-existence between business and the environment in the future. It was decided that it should be revised and published on a commercial basis, in order to disseminate such useful information.

The NDP Project took over this work from the Environmental Governance Project with the above objective. In October 1999, study group meetings were resumed, in order to conduct serious discussions on each report. In October 2000, "Business and Environmental Governance" was published in Japanese by Chuo Hoki Publishing Co., Ltd., with reports that were re-written based on discussions at the meetings.

Methodology

- Established study group meetings consisting of business people working in the environmental sector
- Discussed and reported on pollution control and environment by the members
- Evaluated corporate environmental activity from the perspective of environmental governance

Findings

The book " Business and Environmental Governance" consists of an introduction, nine chapters and a supplementary chapter. As Prof. Morishima, President of IGES, explained in the introductory chapter, the business sector has played a major role in the past in overcoming pollution and complying with standards set in laws and ordinances. It is expected that business will play a much bigger role to cope with current environmental problems, such as global warming, problems with waste, and others. He defined the term "environmental governance," which is often vaguely understood, and discussed the frameworks and functions of systems and rules needed to attain a cleaner environment and sustainable society.

In the first chapter, Isao Iwabuchi writes an overall description of the history of post-war economic growth in Japan, which has caused changes in industrial structure and the characteristics of environmental problems. He divides his analysis into four periods: serious pollution caused by high economic growth (1945-1969), pollution control and the oil shock (1970-1979), urban environmental problems (1980-1989), and global environmental problems (1990-).

In the second chapter, Makoto Takasaki explains steel companies' efforts to cope with air and water pollution. He uses extensive data to introduce policy instruments for coping with pollution, such as pollution control agreements, pollution control management systems, and compensation and protection through a health system to deal with pollution-related diseases.

In the third chapter, Masayuki Sasanouchi introduces the role of command and control approaches for protecting the environment. In his explanation, he uses the example of Japanese automobile companies' efforts to meet strict automobile exhaust regulations in the 1970s and to cope with current global warming issues.

In the fourth chapter, Naoatsu Ishizaki writes on the efforts in the past and tasks in the future of the chemical industry to cope with various environmental problems that occurred from handling chemicals, which were main cause of pollution.

In the fifth chapter, Bunji Otsutake describes the role of electric power companies in improving the environment, through promoting the efficient use of energy.

In the sixth chapter, Shintaro Shida explains waste problems and soil pollution. As described from the first to the fifth chapter, many Japanese companies have reached the levels of addressing issues of global environmental governance, in part due to results achieved through the promotion of anti-pollution and environmental measures. Nevertheless, there are some unsolved problems. Among these are waste problems and soil pollution, which the industry must work towards solving. The effects of these two will accumulate in the long run. Therefore, these two problems present a current environmental challenge for most industries.

In the seventh chapter, Dr. Noriyuki Kobayashi discusses environmental problems, focusing on tropical forests. Forests fulfil an important function in the conservation of the environment, provide wood, and are an important renewable resource. Furthermore, attention has recently been drawn to the function of wood and forests in the mitigation of global warming.

In the eighth chapter, Mr. Kubota explains the measures of electrical and electronics industries to cope with environmental problems, describing the background, details and roles of ISO 14001.

In the ninth chapter, Takaaki Moroto concludes this book, analyzing industry's efforts in the past and tasks in the future to establish a recycling-oriented society in which the environment and economy can coexist.

In a supplementary chapter, Rie Sugiyama and Shuzo Katsumoto, researchers of IGES, survey industrial policy after the Second World War in order to provide background information for the first nine chapters.

Open Symposium on "Business and Environmental Governance"

To commemorate the publication of this book, the open symposium "Business and Environmental Governance: the direction of Business Voluntary Initiatives" was held in November 2000. While the book dealt with business efforts from the past to the present, this symposium focused on the future role of business in establishing a sustainable society. The latest information about corporate efforts was reported and discussed, including Keidanren's Voluntary Action Plan, environmental reporting, environmental rating systems, and eco funds. Current and future corporate efforts differ according to sector and scale of the business. As a result, decisive conclusions could not be reached through the discussion about the future role of businesses in establishing a sustainable society. Nevertheless, this symposium provided opportunities for realizing that corporations continue to make efforts to improve the environment and collaborative action from consumers is vital in establishing a sustainable society.

The survey on environmental reporting and environmental performance indicators

The business sector has made an effort to comply with, and sometimes go beyond the standards set in laws and ordinances in order to establish a sustainable society. Recently many companies have been making environmental reports to evaluate their efforts to improve the environment. The information disclosed in environmental reports is being used as a basis for investment indicators, for use in eco-funds and environmental ratings. Here the environmental performance of each company is linked to its ability to attract capital. Thus, it is important that corporate strategies efficiently cope with environmental problems and effectively disclose information on their efforts. On a global level, ongoing efforts are attempting to set standard guidelines for making environmental reports. One attempt is the Global Reporting Initiative (GRI). GRI is trying to set guidelines, including environmental, social and economic indicators. The idea of GRI is that these three types of indicators enable access to information on the comprehensive contribution of each company to society.

Responding to these international trends, Japan's Ministry of the Environment is revising guidelines on environmental reporting and drafting environmental performance indicators for business.

Members of the NDP Project have been participating in study group meetings on environmental performance indicators, environmental reporting, environmental reporting networks, and GRI workshops with the objectives of

collecting the latest information and making a proposal on the disclosure system on business activities information in the second phase.

Methodology

Information was collected through participation in study group meetings and workshops.

Findings

Study Group on Environmental Performance Indicators

Indicators are necessary for companies and the third parties to grasp and evaluate companies' efforts to conserve the environment. For evaluating companies' efforts precisely, Japan's Ministry of the Environment organized this study group with the participation of academic experts, NGOs and business people, and collected information on various indicators used for eco-funds and environmental rating. It is developing environmental performance indicators for companies. In November 2000, the interim report of indicators was drafted and public comments on the draft were invited. Based on the comments, the final version was to be completed by the end of March 2001.

Study Group on Environmental Reporting Guidelines

Environmental reporting is an important way to enhance the transparency and accuracy of information about the environmental impact of corporations and the measures they take to improve their environmental performance. Japan's Ministry of the Environment drafted guidelines for environmental reporting in 1998. In the ensuing years, discussions on environmental reporting have been vigorous at the international level, through the GRI, ISO and so on. Responding to this situation, the Ministry of the Environment organized a study group in order to revise its guidelines to be more practical and consistent with international standards. The interim report of this study group was also drafted in November 2000, and public comments on the draft were welcomed. The final version was to be completed by the end of March 2001.

Environmental Reporting Network

The Environmental Reporting Network was organized in Japan by an NGO called the Global Environment and People Forum. Companies, the Ministry of the Environment, consumer groups, auditing companies, and research institutes are voluntarily participating in the network. Meetings have been held once a month and the objectives, targets, and both writers and readers of environmental reports discussed their contents as well as systems to enhance the credibility of information in the reports. The objective of the network is to submit realistic proposals to improve reporting. At present the network is conducting surveys to obtain opinions from various sources.

(Rie Sugiyama)

g. Information technology and the environment

One of the priority themes identified in the first year of the overall study on new development patterns was Information Technology and the Environment.

Methodology

As the first step of an exploratory stage of research formation, the NDP Project held an international workshop with the Wuppertal Institute for Climate, Environment and Energy of Germany in November 2000. The workshop, "International Climate Policy and the IT Sector," provided a forum to facilitate constructive discussions on environmental implications of the digital economy and a policy framework that can support industry's efforts to address global warming. Thirty participants attended the workshop from the IT industry, German and Japanese

governments, and research institutes. The results of the workshop were reported at a side event co-organized by IGES and the Wuppertal Institute on 23 November 2000 in The Hague, during the Sixth Conference of the Parties to the UNFCCC (COP6).

In December 2000, the NDP Project set up a study group on IT and the environment with Nikkei Business Publications (Nikkei BP). The Japanese company offers a wide range of products and services including print publishing, online media, events, consulting and education. This study group consists of experts from various sectors associated with IT and the environment, and will gather monthly for one and half years to discuss the possible impacts of further development of IT on economic and social systems.

These two forums are expected to yield ideas regarding possible directions of future research that the NDP Project will pursue in the second phase of IGES strategic research.

Findings and Analysis

Since this research is at the embryonic stage, it will take a certain period of time until insightful findings for decision-makers are made available. The following are the major points of the discussion at the international workshop with the Wuppertal Institute held in November 2000.

- The annual electricity consumption of Internet use in Germany in 2000 was estimated to total about 4.2 TWh, corresponding a little less than 0.3 percent of the total German CO2 emissions in the same year. Although this figure remains small today, the anticipated expansion of Internet use in the future has the potential to dramatically increase the green house gas emissions caused by use of the Internet. Under the assumption that current levels of technologies and efficiency do not change, the figure may rise up to 2.5 percent in 2010, but may be limited to around 1 percent if effective policies to enhance energy efficiency of Internet devices are put into practice.
- The widely known International Energy Star Program establishes a standard only for the low power mode of personal computers. It is important to improve the energy efficiency of PCs during actual operation.
- The ecolabeling certification process takes too long to follow the rapidly-developing technologies of IT products.
- In order to build effective green procurement schemes of IT products, it is necessary to change consumer behavior as well as producers' purchasing patterns.

The study group co-organized with Nikkei BP had been held twice by the end of January 2001. A brainstorming session on the interactions between IT, society and environment was conducted, and presentations were made and discussed regarding several examples of practical efforts by corporations such as the introduction of computer-aided design (CAD) and efforts to go paperless.

Research on IT and global warming was consigned to IGES by Japan's Ministry of Posts and Telecommunications in October 2000. The NDP Project was in charge of the research, and expected to prepare its first draft by the end of March 2001.

(Shuzo Katsumoto)

3. Conclusions

3.1 Conclusions

Considering that the NDP Project started late in FY 1998 without an initial thorough project plan, and taking into account its limited resources and time for implementation, the achievements of the project so far have been satisfactory.

3.2 Remaining issues for further research

The original overall goal of the project is to explore new patterns of development in order to arrive at a sustainable society, focussing particularly on Asia and the Pacific region. This is, of course, a mighty task. The first phase of NDP research activities covered only a tiny fraction of the entire effort.

However, we have at least tried to provide an overview of the relevant issues, and have reviewed the current and future environmental and developmental problems in the region. We have also made efforts to identify and to study certain specific issues, such as the transfer of environmentally sound technology, business and environment, and information technology and environment.

In following up the achievements of the first phase activities of NDP, the following steps are required.

First, it is necessary to continue to undertake cross-cutting and long-term studies along the lines implemented under the framework of the Long-term Perspective Project of ECO ASIA and try to integrate various policies at sector-specific levels, with participation and input from other IGES strategic research projects.

Second, it will be important to take up some of the emerging key issues to attain new development patterns and conduct in depth studies on these issues. Included in the examples of these issues are information technology and environment, business and environment, and others.

Third, it will be useful and advisable that the follow-up project prepare and release an “Environmental White Paper for Sustainable Development in the Asia Pacific Region” (tentative name) on a periodic basis in co-operation with other project teams within IGES and relevant organizations outside.

The “Environmental White Paper for Sustainable Development in the Asia Pacific Region” will aim to present evaluation of the environmental status of the region based on local information that is available through networks with collaborating research institutions, and to give innovative policy recommendations for environmental conservation in the twenty-first century.

4. Evaluation and achievements

4.1 Assessments of major outputs

The compilation of issue papers and their subsequent publication as "Environment in the 21st Century and the New Development Patterns," both in English and in Japanese, has helped to stimulate debate on new development patterns to the public at large. Public forums on this issue also helped this process.

The report of the commissioned study on "Transfer of Environmentally Sound Technologies" in the open forum were effective in sorting out issues pertaining to the future development and transfer of environmentally sound technologies, particularly to less developed countries.

The compilation and publication of "Practical Examples of Technology Transfer and Cooperation" both in English and in Japanese was a unique and innovative output in this area. The handbook of the collection of examples proved to be useful in promoting technology development and transfer that will contribute to sustainable development, for developing countries in particular.

The outcome of this study proved to be useful to the Technology Transfer Project under the framework of UNFCCC.

The commissioned study relating to the G8 Environment Ministers' meeting clarified various issues, such as poverty and the environment, recycle oriented society, fresh water, forests, the global commons and UN reform, environment and security, international financial institutions and the environment. This study proved to be timely and unique. The report was welcomed by policy-makers engaged in the G8 environment ministers' meeting. It also laid a solid foundation in understanding possible issues to be taken up in the preparatory process of the Rio+10 Conference.

The Long-term Perspective Project is a study project under the ECO ASIA congress, which is a policy consultation forum for environment ministers and senior officials in the Asia-Pacific region. The LTPP aims to provide the ECO ASIA congress with information on regional perspectives and policy options relating to the environment and development, based on scientific data. Since 1999, IGES was assigned to implement work on the LTPP, which is highly relevant for policy applications.

The inputs into and keynote speech at ECO ASIA '99 set the tone of the conference. Also, a package of current situation and policy papers, including "Policy implications in addressing critical environmental and sustainable development issues of the region" as well as "Specific issues on sustainable development in Asia and the Pacific," which were submitted to the ECO ASIA Long-term Perspective Project international workshop in February 2000, regional reparatory meeting of ESCAP/ MCED held in Bangkok in May 2000, Senior Officials Meeting of ESCAP/ MCED, MCED 2000 and ECO ASIA 2000 held in September 2000 in Kitakyushu City, proved to be significant contributions to these meetings and the whole process leading up to MCED 2000. Kazuo Matsushita, leader of the NDP Project, made a keynote presentation on a progress report on phase 2 of the ECO ASIA Long-term Perspective Project, which was appreciated by the participants and stimulated a discussion on future policy directions towards the Rio+10 process.

The public welcomed the publication of the book entitled "Business and Environmental Governance." In particular, the book was unique in that it was written by those who were responsible for environmental management in respective companies such as Nippon Steel, Mitsubishi Chemicals, and Toyota. It analyzed the experience of environmental pollution by the Japanese companies, and how the companies affected environmental policy formulation. Conversely, it also analyzed how the environmental policies affected corporate behavior. The publication and subsequent open forums facilitated dialogue between various stakeholders.

One of the priority themes identified in the first year of overall study on new development patterns was "Information technology and environment."

As the first step of an exploratory stage of research formation, the NDP Project held an international workshop with the Wuppertal Institute for Climate, Environment and Energy of Germany in November 2000. The workshop "International Climate Policy and the IT Sector" provided a forum to facilitate constructive discussions on environmental implications of the digital economy and a policy framework that can support industry's efforts to address global warming. Thirty participants attended the workshop from the IT industry, German and Japanese governments, and research institutes. The results of the workshop were reported on 23 November 2000 co-organized by IGES and the Wuppertal Institute at a side event of the Sixth Conference of the Parties to the UNFCCC (COP6) in The Hague.

The study group co-organized brainstorming sessions with Nikkei BP on interactions between IT and society and environment, which produced useful insights for further study.

The NDP Project convened various outreach activities, including a public forum on the "Transfer of Environmentally Sound Technology," "Japan-U.S. Forum on Environmental Issues," "The Environment in the 21st Century and New Development Patterns," "Corporate Environmental Governance." These forums were attended by a variety of participants including government officials, business people, NGOs and the public at large, and facilitated dialogue and mutual understanding of their respective positions and identifying future collaboration.

ECO ASIA '99 was attended by more than 100 participants, including representatives of 17 countries as well as 11 international organizations. ECO ASIA 2000 was attended by more than 240 participants from 40 countries in the region, including ministerial level participants of 23 countries as well as representatives from 17 international organizations. ESCAP/MCED was attended by more than 220 participants from 42 countries/regions, including 31 ministerial/vice-ministerial level participants as well as representatives from 33 international organizations.

4.2 Evaluation of the performance of the Project

Considering that the NDP Project started late in FY 1998 with limited resources and time and without a clearly defined project plan, the overall achievements of the first phase were satisfactory. In its implementation of research activities, the NDP Project had to face various difficulties.

First, it has to define its targets, research plan, methodologies, etc., after other projects had already started. It had to tackle this task through trial and error. In particular, the concept of "new development patterns" was not easy to define. The approach taken was to prepare papers on various issues considered to be relevant to this theme. The papers prepared later were compiled and edited into a book entitled "Environment in the 21st Century and New Development Patterns." This book provided a sound basis for discussion on this important issue.

Second, the NDP Project had to establish a good and substantial working relationship with other strategic research projects since its topics are crosscutting with other projects. In order to prepare papers that are relevant to policy, on various issues including climate change, urban environmental issues, forestry, etc., with a view to attaining sustainable development in the region, close working relationships and understanding of specific issues and project were necessary. In the second phase, stronger linkages and working relationships will be required in order to improve project performance.

Third, the NDP Project had to respond to and link itself with policy consultation forums and requests from policy-makers. This is one of the important functions of policy-oriented research institutes like IGES. ECO ASIA, ESCAP/MCED, G8 Environment Ministers' Meeting, study on the transfer of environmentally sound technologies are among the examples of our support for policy-makers. These were challenging tasks. However, it turned out to be a very good opportunity to put forward IGES' ideas and research results into policy considerations and discussions by high-level policy-makers.

Fourth, in the third year, the NDP Project conducted studies on specific issues. Included in these were "business and

environmental governance" and "IT and the environment." As to the former, a special study team was set up, which was composed of senior managers of leading Japanese corporations. The group compiled its study results and published a book. This exercise was a very good example of the constructive partnership between IGES and the business community. The issues of both "business and environment" and "IT and environment" will be further studied in the second phase.

4.3 Evaluation of management of the Project

In FY 1998, the project was initiated in July with only one senior research fellow (Glen Paoletto), joined by another senior research fellow (Kazuo Matsushita, Acting Vice-President) in late August, who later became the project leader. In FY 1999, Glen Paoletto left the NDP Project and a research associate (Takashi Otsuka) joined. In FY 2000, two research associates (Rie Sugiyama and Shuzo Katsumoto) joined the NDP Project.

With such a small number and changing composition of staff and the growing mandate to cover the ambitious objectives of addressing new development patterns, as well as the need to respond to requests from the government, it was not easy to effectively manage the project. Effective and efficient work by the research secretary (Naoko Miyazaki) eased the difficult situation to a great extent.

At present, the NDP Project is composed of three research associates and one project leader. In order to carry out various components of the project and supervise day-to-day research and other activities, at least one additional research fellow or project coordinator is necessary.

There is another point that should be noted. Since most of the activities of the NDP Project depended heavily on commissioned work from the Ministry of Environment of Japan so far and required cooperation and input from other on-going strategic research projects, it required substantially additional efforts and time on the part of this project to maintain close coordination with the Ministry of the Environment and linkages with other research projects.

4.4 Economic efficiency of Project management

This project was conducted very efficiently, using financial resources from outside such as the former Environment Agency of Japan (commissioned studies on "LTPP Project of ECO ASIA," "Transfer of Environmentally Sound Technology," and "G8 Environment Ministers' Meeting"), the Center for Global Partnership of the Japan Foundation (the joint public forum "Japan-U.S. Forum on Environmental Issues"), the Asian Development Bank (joint workshop on the "Asian Environment Outlook"), and the Nikkei BP company (joint study group on "IT and Environment").

The publications of the project outputs through commercial academic publishers (two Japanese books from Chuo Hoki Publisher in Japan and one English book from Kluwer Academic Publishers in the Netherlands) were successful in terms of publicity and quality as well as cost effectiveness.

The study on "Business and Environment" was conducted with the participation of experts from leading Japanese private companies. These experts made substantial contributions voluntarily.

4.5 Suggestions for improving the Project in the second phase

In the first phase, the New Development Patterns Project explored new paths for social and economic development in order to change the present civilization based on mass-production, mass-consumption and mass-disposal, focusing on the Asia-Pacific region. However, the study is still at an early stage.

The Asia-Pacific region is predicted to have a greater impact on the global environment in this new century due to its expected economic development and population growth. Therefore, in the second phase, it is essential to continue to evaluate the environmental status of the region based on more accurate and proper data and to provide innovative policy

recommendations based on such evaluations. For this reason, it is advisable for the second phase of the project to prepare and publish the “Environmental White Paper for Sustainable Development in the Asia-Pacific Region” (tentative name) on a periodic basis. In the process of preparation, the environmental information, environmental evaluation, and policy recommendations that are available from organizations such as the Environmental Congress for Asia and the Pacific (ECO ASIA), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the Asian Development Bank (ADB) will be reviewed. The available analyses from a global perspective, such as those by the United Nations Environmental Programme (UNEP), World Bank and the World Resources Institute (WRI) will also be taken into account. The network with other collaborating institutes will also be utilized to collect local information. We expect to put forward innovative policies for the twenty-first century to policy-makers in this region. Activities on these themes will be carried out based on the outputs obtained through preparation of the White Paper.

It is also important to have a system to respond to urgent needs and requests for information from policy-makers during the processes of international environmental policy-making by selecting and reformulating the available research outputs within and outside of IGES in a timely way. The second phase of the project will be responsible for facilitating the planning and implementation of such research.

(Kazuo Matsushita)

5. References

United Nations. 1992. *Agenda 21: Programme of Action for Sustainable Development*, Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992 (A/CONF.151/26/Rev.1)

List of Achievements

1. Commercial Publications

FY1999

IGES(ed.) (1999) "*New Development Patterns and the Environment toward the 21st Century*" Chuo Hoki Publishing Co., 350pp.

FY2000

IGES(ed.) (2000) "*Business and Environmental Governance*", Tokyo, Chuo Hoki Publishing Co., 300pp.

MATSUSHITA, Kazuo (ed.) et. al. (2000) "*Environment in the 21st Century and New Development Patterns*", Dordrecht, Kluwer Academic Publishers, 300pp.

MATSUSHITA, Kazuo (2000) "*Kankyo Seiji Nyumon : Introduction to Environmental Politics*", Tokyo, Heibonsha Ltd., Publishers, 218pp.

2. Books Published by IGES

FY1998

IGES (1999) "*Practical Examples of Technology Transfer and Cooperation*" Hayama, IGES, 60pp.

IGES (1999) "*Practical Examples of Technology Transfer and Cooperation: Toward Environmental Protection and Sustainable Development in Developing Countries*" Hayama, IGES, 60pp.

IGES (1999) "*Transfer of Environmentally Sound Technology*" Proceedings of the Open Forum, Hayama, IGES, 85pp.

IGES (1999) "*Transfer of Environmentally Sound Technology*" Report of the Study Group, Hayama, IGES, 140pp.

IGES (1999) "*Transfer of Environmentally Sound Tecnhology*" Report of the Open Forum, Hayama, IGES, 100pp.

FY1999

IGES New Development Patterns Project (2000) "*Commissioned Study Report on Settling the Action Plan for the Asia-Pacific Environment Based on Long-term Perspectives FY1999*" (English and Japanese bound together) Comissioned by the Ministry of Environment, Hayama, IGES, 195pp.

FY2000

IGES New Development Patterns Project (2000) "*Important Issues Related to Environment and Development: Towards Rio +10*", 150pp.

IGES New Development Patterns Project (2000) "*Japan-U.S. Forum on Environmental Issues: New Development Patterns for Sustainability in Asia-Pacific*", 75pp.

IGES New Development Patterns Project (2000) "*Japan-U.S. Forum on Environmental Issues: New Development Patterns for Sustainability in Asia-Pacific*", 80pp.

IGES New Development Patterns Project (2001) "*Commissioned Study Report on Settling the Action Plan for the Asia-Pacific Environment Based on Long-term Perspectives FY2000*" Comissioned by the Ministry of Environment(To be published)

3. Workshops and Seminars organized by IGES

FY1998

Date	Title of the workshop	Lecturers and participants	Place
Jan. 29-30, 1999	New Development Patterns Project Workshop	Yasuhiro MUROTA (Shonan Econometrics), Haruki TSUCHIYA (Research Institute for Systems Technology), Tadahiro MITSUHASHI (Nihon Keizai Shimnun Inc.), Makoto MURASE (Sumida Ward Office), Ryokichi HIRONO (Seikei Univ.), Shinji FUKUKAWA (Dentsu Institute for Human Studies), Takeshi HARA (Waseda Univ.), Hari SRINIVAS (Tokyo Institute of Technology), Cindy TERMORSHUIZEN (Tokyo Institute of Technology), Glen PAOLETTO	Shonan Village Center/Hayama
Mar. 26, 1999	Open Forum: Transfer of Environmentally Sound Technology (Environment Agency of Japan)	Masayuki GOTO (Environment Agency of Japan), Michio HASHIMOTO (Overseas Environmental Cooperation Center), Masaru NAKAJIMA (Decentralized Energy Research Group), Terushi TOMITA (Tools For Self Reliance Japan), Mitsuhiro YAMAMOTO (Overseas Environmental Cooperation Center), Masahisa NAKAMURA (Lake Biwa Research Institute), Hiroyuki ISHITOBI (Global Environmental Centre Foundation), Hiroshi SHIMIZU (Keio Univ.), Haruki TSUCHIYA (Research Institute for Systems Technology), Akira MORISHIMA (Japan Environment Corporation), Kenji OYA (United Nations Centre for Regional Development), Kazuo MATSUSHITA, Hidefumi IMURA, Takahiko HIRAISHI	Yokohama Queen's Tower/Yokohama

FY1999

Date	Title of the workshop	Lecturers and participants	Place
Aug. 2, 1999	Japan-US Forum on Environmental Issues (The Japan Foundation Center for Global Partnership)	Charles PEARSON(Johns Hopkins University), John DIXON(World Bank), Miranda SCHREURS(University of Maryland), Kenneth WILKENING (Nautilus Institute), Edith BROWN WEISS(Georgetown University), Takeshi HARA (Waseda University), Tomoko SAKUMA (People's Forum 2001), Akio MORISHIMA,Kazuo MATSUSHITA,Hidefumi IMURA,Tae Yong JUNG	The Japan Foundation Conference Hall/Tokyo
Dec. 9, 1999	A Symposium to Commemorate the Release of the Book "New Development Patterns and the Environment toward the 21st Century"	Michio HASHIMOTO (Overseas Environmental Cooperation Center), Tadahiro MITSUHASHI (Nihon Keizai Shimbun Inc.), Ryokichi HIRONO (Seikei University), Shinji FUKUKAWA (Dentsu Institute for Human Studies), Haruki TSUCHIYA (Research Institute for Systems Technology), Makoto MURASE (Sumida Ward Office),Hari SRINIVAS (United Nations University), Akio MORISHIMA, Kazuo MATSUSHITA	Housou Kaikan/Tokyo
Feb. 19-21, 2000	ECOASIA-LTPP Eco-consciousness Project International Comparative Study Group Planning Work Shop	Yok-shiu F. LEE (The University of Hong Kong), James E. NICKUM (Hosei University), Opart PANYA (Mahidol University), A. Terry RAMBO(Center for Natural Resources and environmental Studies (CRES)), Bishnu BHANDARI , Takashi OTSUKA	Shonan Village Center/Hayama

FY2000

Date	Title of the workshop	Lecturers and participants	Place
Sep. 21, 2000	Asian Environment and Development in the 21st Century (Asian Development Bank)	S. Tahir QADRI (Asian Development Bank), Kazuaki HOSHINO (Environment Agency of Japan), Wakako HIRONAKA (Member of the House of Councilors), Tsutomu TANAKA (Chuo Univ.), Satoru MATSUMOTO (Mekong Watch), Akio MORISHIMA, Kazuo MATSUSHITA, Tae Yong JUNG	Kasumigaseki Bldg./ Tokyo
Nov. 2, 2000	A Symposium to Commemorate the Release of the Book Business and Environmental Governance: How Far Can Voluntary Approaches by Enterprises Develop? Issues for the Future in Private Enterprises and Environmental Governance (Chuo Hoki Publishing Co.)	Isao IWABUCHI(Sky Alminium Co., Ltd.), Shintaro SHIDA (Tokio Marine & Fire Insurance Company, Ltd.), Naoatsu ISHIZAKI (Mitsubishi Chemical Corporation), Noriyuki KOBAYASHI (Sumitomo Forestry Co., Ltd.), Masayuki SASANOUCHI (Toyota Motor Corporation), Makoto TAKASAKI (Nippon Steel Corportation), Takaaki MOROTO (ITOCHU Corportation), Akio MORISHIMA	Kasumigaseki Bldg./ Tokyo
Nov. 13-14, 2000	Workshop of the 2nd Policy Dialogue between Japan and Germany for Facilitating Coordinated Measures to Address Global Warming: International Climate Policy and the IT-Sector (Wuppertal Institute for Climate, Environment and Energy)	Kouji GAMOU (Matsushita Electric Industrial Co., Ltd.), Takeshi KOGA (Fujitsu Limited), Hidemi TOMITA (Sony Corportation), Shirou NISHI (Nippon Telegraph and Telephone Corporation), Kouji YAMAGUCHI (NEC Corporation), Masaharu YAGISHITA (National Environmental Training Institute), Tiny HUIJBEN(Oce-Technologies B.V.), Val HERMAN (ICL Belgium), Kai KRAMER (Electrocycling GmbH), Kurt SCHIWY (Deutsche Telekom AG), Ferdinand QUELLA (Siemens AG), Silvio WEEREN (IBM Deutschland GmbH), Elmar NOLTE (ELSA AG), Thomas FORTH (Bundesministerium fur Umwelt, Naturschutz und Reaktorsicherheit), Thomas LANGROCK (Wuppertal Institute for Climate, Environment and Energy (WI)), Herman E. OTT (WI), Thomas DWORAK (WI), Stefan THOMAS (WI), Akio MORISHIMA, Kazuo MATSUSHITA, Shinichi ARAI, Tae Yong JUNG, Shuzo KATSUMOTO	Wuppertal Institute for Climate, Environment and Energy/ Wuppertal/Germany
Jan. 15-17, 2001	International Seminar on Environmental Consciousness in Asia: Comparative Studies of Japan, China (Hong Kong), Vietnam and Thailand (The Faculty of Environment and Resource Studies, Mahidol Univ.)	A. Terry RAMBO (Kyoto Univ.), James E. NICKUM (Hosei Univ.), Midori AOYAGI-USUI(National Institute for Environmental Studies), Yok-shiu F. LEE (The Univ. of Hong Kong), Tuong-Vi PHAM (Center for Natural Resources and Environmental Studies), Opart PANYA (Mahidol Univ.), Solot SIRISAI (Mahidol Univ.), Bishnu BHANDARI, Takashi OTSUKA	Mahidol Univeristy/ Bangkok/Thailand

4. Academic Papers

(i) Papers compiled and published by IGES

FY2000

IGES (2000) "Policy Implications in Addressing Critical Environment and Sustainable Development Issues of the Region: Specific Issues on Sustainable Development in Asia and the Pacific" *E/ESCAP/SO/MCED(00)/INF.6* (Information Document at the ESCAP Senior Officials Meeting), 17pp.

IGES (2000) "Specific Issues on Sustainable Development in Asia and the Pacific" Attached to E/ESCAP/SO/MCED(00)/INF.6, 74pp.

KATSUMOTO, Shuzo (2001) "GHG Emission Trends of the Internet: Indications to facilitate research" Discussion Paper for the Workshop of the 2nd Policy Dialogue between Japan and Germany for Facilitating Coordinated Measures to Address Global Warming: International Climate Policy and the IT-Sector, *Japan & Germany: International Climate Policy & the IT-Sector* (to be published)

(ii) Contributions to journals outside of IGES

FY1999

MATSUSHITA, Kazuo (1999) "Economic Effects of Environment-related Public Works" *Shigen Kankyo Taisaku (Journal of Resources and Environment)* Vol. 35 No.2, p.40-42

MATSUSHITA, Kazuo (1999) "Environmentally Sustainable New Development Patterns" *Kankyo (Environment)* May 1999 Issue, p.19-20

MATSUSHITA, Kazuo (1999) "In Search of an Environmentally Sustainable New Development Patterns" *Kikan Kankyo Kenkyu (Environmental Research Quarterly)* issue No. 113, p.39-45

MATSUSHITA, Kazuo (1999) "Japanese Government and its Environmental Policy: Afterthoughts of Kyoto Conference" *Peace Studies Newsletter* No.18, June 1999

MATSUSHITA, Kazuo (1999) "Law for the Promotion of Activities of NPOs and its Implication for the Future Society" *Haikibutsugakkaishi Shimin Henshu (C&G, The Japan Society of Waste Management Experts)* 1999 No.3

MATSUSHITA, Kazuo (1999) "Sustainable Society and Environmentally Sound Social Infrastructure" *Jichitai Kenkyu* No.79

MATSUSHITA, Kazuo (2000) "Environment in Asia and New Development Patterns" *Shigen Kankyo Taisaku (Journal of Resources and Environment)* No.36 No.1 p. 29-32

FY2000

MATSUSHITA, Kazuo (2000) "Environment and Development in Asia" *JapanEcho* No. 27, p.14-18

MATSUSHITA, Kazuo (2000) "Environment et developpment en Asie" (in French), *Cahier du Japon* No. 85, p.22-27

MATSUSHITA, Kazuo (2000) "Global Environmental Issues and Small and Medium Enterprises" *Chusho Kigyo Monthly* Dec 2000 issue, p.6-7

MATSUSHITA, Kazuo (2000) "Looking Back upon the Twentieth Century" (part 1), *Seikatsu to Kankyo (Life and Environment)* May 2000 issue, p.49-52

MATSUSHITA, Kazuo (2000) "Looking Back upon the Twentieth Century" (part 2), *Seikatsu to Kankyo (Life and Environment)* June 2000 issue, p.49-52

MATSUSHITA, Kazuo (2000) "Looking Back upon the Twentieth Century" (part 3), *Seikatsu to Kankyo (Life and Environment)* July 2000 issue, p.74-78

MATSUSHITA, Kazuo (2000) "Path to Green Environmental Economy" (part 1), *Cultural Capital* No.1, p.46-47

MATSUSHITA, Kazuo (2001) "Path to Green Environmental Economy" (part 2), *Cultural Capital* No.2, p.43-45

MATSUSHITA, Kazuo (2001) "Revisiting The Global 2000 Report(1): Report to the American President" *Green Power* Jan 2001 issue, p.6-7

MATSUSHITA, Kazuo (2001) "Revisiting The Global 2000 Report(2): Thoughts from the Hague Conference (COP6)" *Green Power* Feb 2001 issue, p.4-5

SUGIYAMA, Rie (2000) "The Current Situation of Voluntary Approaches in European Countries" *Journal of Environmental Law and Policy* Vol.3, p.161-170

5. Lectures at Workshops and Seminars

FY1999

Date	Titles	Lecturers	Place
May 28-29, 1999	"Concern for Global Environmental Problems in Tokyo Metropolitan Area" The Society for Human Ecology, Xth International Conference	Takashi OTSUKA	Montreal/Canada
Jun. 15, 1999	"Climate Change and National Policy Reform" East Asia regional Seminar on Climate Change and National Policy Reform (The World Bank Institute, Japan Development Bank)	Kazuo MATSUSHITA	Singapore
Sep. 4, 1999	"Realizing Sustainable Society in the Asia-Pacific Region in the 21st Century" Keynote speech at ECO ASIA '99 (EAJ, Hokkaido, Sapporo)	Kazuo MATSUSHITA	Keio Plaza Hotel/ Sapporo
Oct. 2, 1999	"Peace Making through Environmental Cooperation in the Asia-Pacific Region in the 21st Century" US-Japan Cooperation On Environmental Security in Northeast Asia/ESENA workshop (Nautilus Institute)	Kazuo MATSUSHITA	Berkeley/USA
Oct. 15-16, 1999	"Some Observations of Environmental Indicators and National Policy Formulation:From Japanese and Asian Experience" Workshop on Environmental Indicators for Economies in Transition (Regional Environment Center for Central and Eastern Europe and EBRD)	Kazuo MATSUSHITA	Budapest/Hungary
Dec. 20-23, 1999	"Lectures on Sino-Japan Comparative Studies on Environmental Policies" JICA project on Sino-Japan comparative study (JICA)	Kazuo MATSUSHITA	Beijing/China
Feb. 22-23, 2000	"An Overview of Environmental Policies in the Changing Asia-Pacific Political, Economic, and Social Climate" The 7th International Workshop on ECO ASIA Long Term Perspective Project (EAJ, IGES, AIRIES)	Kazuo MATSUSHITA	Shonan Village Center/ Hayama
Feb. 27, 2000	"Strategy of Japan in Global Environment" Lecture in Sekai wo Kangaeru Kyoto Zadankai	Kazuo MATSUSHITA	PHP Research Institute/Tokyo

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Date	Titles	Lecturers	Place
May 9, 2000	"Critical Environmental and Sustainable Development Issues of the Region and Measures for Promoting Sustainable Development, Including Partnership with Private Sector and Civil Society Groups" United Nations Economic and Social Commission for Asia and the Pacific Regional Review Meeting (ESCAP/RRM) (United Nations Economic and Social Commission for Asia and the Pacific)	Kazuo MATSUSHITA	ESCAP/Bangkok/ Thailand
May 12, 2000	"Towards a New Pattern of Development: Zero Emission Initiatives" International Symposium on Environmental Vision and Strategy for 21st Century (The Korean Association for Public Administration)	Kazuo MATSUSHITA	Seoul/Korea
Aug. 31, 2000	"Policy Implications in Addressing Critical Environment and Sustainable Development Issues of the Region" United Nations Economic and Social Commission for Asia and the Pacific Ministerial Conference on Environment and Development Senior Officials Meeting (ESCAP/MCED/SOM) (United Nations Economic and Social Commission for Asia and the Pacific)	Kazuo MATSUSHITA	Rihga Royal Hotel Kokura/Kitakyushu
Sep. 3, 2000	"Progress Report of the ECO ASIA LTPP, Phase 2" Environment Congress for Asia and the Pacific (Environment Agency of Japan, Fukuoka Prefecture and City of Kitakyushu)	Kazuo MATSUSHITA	Rihga Royal Hotel Kokura/Kitakyushu
Oct. 18, 2000	"Building Sustainable Society in the Asia-Pacific Region in the 21st Century" The Asia Global Environment Forum 2000 (Research and Development Initiative (RDI) and Chuo Research Unit for Global Environment (CRUGE))	Kazuo MATSUSHITA	Chuo University, Ichigaya Campus/ Tokyo
Jan. 15, 2001	"Overview of ECO ASIA Long-term Perspective Project and IGES" International Seminar on Environmental Consciousness in Asia (Mahidol University and IGES)	Takashi OTSUKA	Mahidol Univeristy/ Bangkok/Thailand
Feb. 27, 2001	"ECO ASIA Long-term Perspective Project's Contribution to ECO ASIA 2000 and ESCAP/MCED 2000" ECO ASIA Long-Term Perspective Project 8th International Workshop (Ministry of Environment)	Kazuo MATSUSHITA	Keio Plaza Hotel/ Tokyo

Feb. 27, 2001	"Draft Structure of ECO ASIA Long-term Perspective Project 2nd Phase Final Report" ECO ASIA Long-Term Perspective Project 8th International Workshop (Ministry of Environment)	Takashi OTSUKA	Keio Plaza Hotel/ Tokyo

6. Participation in Committees outside of IGES

FY1999

Hosting organization	Name of the committee	Participant from IGES	Term of office
Global Environment Department, Environmental Agency of Japan	Global Security Study Group (Chair)	Kazuo MATSUSHITA	May 1999 -Jul. 1999
The Cabinet Security Affairs Office	Study Group on Overall Security "Keynote Report on Global Security"	Kazuo MATSUSHITA	Feb. 2000

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Hosting organization	Name of the committee	Participant from IGES	Term of office
Environment Agency of Japan	Study Group on Environmental Performance Indicator	Shuzo KATSUMOTO, Rie SUGIYAMA	May 2000-Jan. 2001
Environment Agency of Japan	Study Group on Environmental Reporting Guideline	Shuzo KATSUMOTO	Sep. 2000-Feb. 2001
IGES	Study Group on Measures for Promoting Efficient International Cooperation	Kazuo MATSUSHITA	Jan. 2001-Mar. 2001
IGES, Nikkei Business Publication, Inc.	Study Group on Information Technology Revolution and Environment	Kazuo MATSUSHITA, Shuzo KATSUMOTO	Dec. 2000-
National Institute for Research Advancement	Study on Building a System for Harmonious Coexistence of Human Environment and Sustainable Development in the Face of Globalization	Kazuo MATSUSHITA	Nov. 1999-Dec. 2000
Shoji Homu Kenkyu Kai	Study Group on Voluntary Approaches	Rie SUGIYAMA	Jan. 2001-Mar. 2001
Shoji Homu Kenkyu Kai	World Environmental Policy on Climate Change	Rie SUGIYAMA	Jun. 2000-Mar. 2001
The Japan Forum on International Relations, Inc.	Study Group on Rio +10 and Environmental Diplomacy of Japan	Kazuo MATSUSHITA	May 2000-

7. Field studies

FY1999

Date	Purpose	Place	Participants from IGES
Oct. 31-Nov. 4,1999	Interview Survey on New Middle Class Peoples' Environmental Consciousness	Shanghai/China	Takashi OTSUKA
Mar. 24-31,2000	Visiting Relevant Persons and Institutions in Order to Clarify the Contents and the Procedures of the Document Submitted to ECO ASIA Long Term Perspective Project	Bangkok/Thailand	Kazuo MATSUSHITA, Takashi OTSUKA, Shuzo KATSUMOTO

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Date	Purpose	Place	Participants from IGES
May 7-11, 2000	Participation to the UN ESCAP Regional Review Meeting and collecting information for preparing policy recommendation document for ESCAP/MCED (00)	Bangkok/Thailand	Kazuo MATSUSHITA, Takashi OTSUKA
Sep. 16-19, 2000	Interview survey to experts in Beijin and Wuhan, China, on their environmental awareness	Beijin, Wuhan/China	Takashi OTSUKA
Nov. 13-15, 2000	Participation to the second international conference on Global Reporting Initiatives (GRI), information collection for environemental reports and establishing environmental performance indicator	George Washington University/ U.S.A	Hidefumi KURASAKA
Jan. 29-30, 2001	Participation to the GRI Measurement Working Group, information collection for environemental reports and establishing environmental performance indicator	Zurich/Switzerland	Hidefumi KURASAKA
Jan. 30-31, 2001	Survey on current status of voluntary approaches in Germany	Bundesverband der Deutschen Industrie e.V. (BDI), Ministry of Environment of Germany/ Germany	Rie SUGIYAMA
Feb. 2, 2001	Survey on current status of voluntary approaches in Europe	CERNA (Centre d'Economie Industrielle)/France	Rie SUGIYAMA

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