Introduction

Akio MORISHIMA
Chair of the Board of Directors

This report contains a summary of the project research carried out by the Institute for Global Environmental Strategies (IGES) during the First Phase of Strategic Research, which lasted for the three years from the Institute's establishment in April 1998 until March 2001. It also includes a summary of both internal and external evaluations of the results of this First Phase Research. The detailed reports of the six research projects have already been published in separate documents, to which readers may also refer.

Although it was set up on the initiative of the Government of Japan, since its inception IGES was structured as an independent, international research institute. Its mandate would be to focus on strategic policy research for achieving sustainable development in the Asia-Pacific region. Furthermore, the team of experts involved in setting the founding policy of IGES made several principles clear. For example, strategic research would be carried out with a project-based system with each research phase lasting three years; researchers would be actively recruited from overseas to be project members; and the Institute would carry out international research, in cooperation with overseas institutes. In order to establish IGES in accordance with the above principles, the Preparatory Organization to Establish IGES was launched in April 1997, and preparations were made to create research and administrative structures in accordance with the founding aims, as well as to determine the themes and contents of the strategic research.

When deciding the research themes and content for the First Phase Strategic Research (April 1998 to March 2001), the Preparatory Organization to Establish IGES sent staff not only to research and governmental institutions in the Asia-Pacific region, but also to Europe and the United States, in order to conduct surveys on strategic research and to seek advice for establishing IGES. In addition, to gather further input, two international workshops attended by experts from Japan and abroad were held. The themes and content of the First Phase Strategic Research were decided as a result of these activities. Five themes—Climate Change, Urban Environmental Management, Forest Conservation, Environmental Education, and Environmental Governance—were selected for the inaugural projects (the New Development Patterns Project was added later). At this stage, as IGES was not known among research communities in and out

of Japan, there were difficulties in selecting its research project themes and recruiting excellent project leaders. Leading researchers in Japan with specialties in each project theme were appointed as project leaders. However, they had to be asked to work on a part-time basis because of employment systems in Japan.

IGES advertised for researchers for a three-year fixed-term of employment, and in spite of the fact that IGES was as-yet unknown, applications were received from a large number of young researchers, making the selection process a difficult task. However, since few applications came from overseas it was not possible to employ as many non-Japanese research staff as planned. On a positive note, when recruitment of researchers was again carried out at the start of the Second Phase, many applications of a superior quality were received, perhaps because IGES had risen in stature as a research institute. The quality of the researchers attracted to an institute such as IGES is inevitably governed by the overall level of the institute's research; conversely, the quality of researchers themselves in large part determines the level of the institute's research outputs. It is imperative that IGES continue to recruit researchers of a high level.

Once the First Phase Strategic Research was underway, there was a need for all researchers at IGES to find a common understanding of what exactly IGES strategic research should be. When researchers from differing backgrounds start to carry out joint research, they may not share even essential concepts in common. These essential concepts concern questions such as what is sustainable development, at what level strategic targets should be set for current issues relating to sustainable development, what are the best methodologies for constructing a strategy, and to what extent the overall issues of the global environment can be approached with traditional disciplines. This challenge of finding a common understanding is not necessarily a problem specific to IGES. At international research conferences on global issues one often finds it impossible to discuss certain matters in depth because of differences in viewpoints, due to a lack of common recognition of the issues, concepts and approaches. All the more, when undertaking strategic research, it is indispensable for all project members to have a common understanding and recognition about strategy targets and methodologies.

I feel that a common understanding and approaches to the strategic research are growing among the IGES researchers after the three years of the First Phase research experience. This is apparent in the self-evaluations of the First Phase research by each project team. The contents of each Second Phase project, with more focused targets and issues and more concrete presentation of research methodologies, also prove that IGES researchers are making good use of the

experiences gained during the First Phase period.

In compiling this report, evaluations have been made by the members of the Research Advisory Committee and external organizations, including the signatory organizations of the IGES Charter as well as non-governmental organizations. IGES was fortunate to receive mainly good evaluations. We are also deeply aware of the many constructive suggestions for improvements to be made in conducting strategic research in the future.

The members of the Boards of Directors and Trustees of IGES provided the fledgling IGES with an abundance of kind advice, covering all aspects, including methods of strategic research and organizational management—not only at official occasions such as board meetings, but on many informal occasions as well. Without this kind of guidance from members of the Boards of Directors and Trustees who are truly concerned about the future of IGES, the foundations of IGES as an international research institute would never have been laid so smoothly. I would like to take this opportunity to give my heartfelt thanks for their cooperation. I also would like to extend my appreciation to all people who have collaborated as visiting researchers or research collaborators in the implementation of research of each project.

Through the First Phase Strategic research, IGES has gained recognition both within Japan and abroad as an international policy research institute. In a way, the First Phase research was a warm-up exercise for the formal marathon of strategic research for the realization of a sustainable society. It is from now on that IGES faces the challenge of proving its value in moving society in that direction. I express my sincere appreciation to all the collaborators of IGES who have given their support to the First Phase research operation, and I invite their continued input and cooperation in the future.

Summary of the First Phase Comprehensive Report

Shinichi ARAI

Secretary-General

1. Introduction

The Institute for Global Environmental Strategies (IGES) seeks to articulate a fundamental paradigm for a new sustainable civilization, through cooperation with experts from around the world, and from a perspective that transcends the interests of any particular nation or social sector. IGES hopes to accomplish this goal by reviewing the conventional set of values that now endanger the global environment—values based on the economics of mass production, mass consumption, and mass disposal. IGES' policy-oriented and practical research activities (strategic research) target the realization of sustainable development of the environment on a global scale, focusing on the Asia-Pacific region, by developing environmental strategies and drafting innovative policy recommendations. IGES hopes to see the results of its strategic research embodied in the policy and decision-making processes of a broad range of national and local governments, and in the activities of private sectors, NGOs, and the public.

The idea of establishing IGES was first recommended in 1995 by the Japanese Prime Minister's Ad Hoc Commission on Global Environment in the Twenty-first Century. After going through a preparatory phase of organization, IGES was formally launched in March 1998 in the town of Hayama, Kanagawa Prefecture in Japan. At the time it was established, IGES built an international network with signatory national administrative (governmental), international, and academic research institutions upon the signing of the Charter for the Establishment of IGES.

The themes of the strategic research projects in the First Phase were drafted based on an eleven-country survey, and then discussed and finalized at the First and Second International Workshops for Strategic Research on Global Environment, attended by experts from Asian countries. The first phase of strategic research, begun in April 1998, was completed at the end of March 2001.

Initially, IGES launched five research projects: Climate Change, Urban Environmental Management, Forest Conservation, Environmental Education, and Environmental Governance. In July 1998, a sixth, the New Development Patterns Project, was added, and another, the Capacity Building Program was created to develop training and online interactive educational programs.

The results of these projects and the program were compiled into reports and publicized. A conference on IGES' achievements was held in Yokohama, Japan in March 2001 to disseminate its research results, which were also publicized in academic papers, IGES Annual Reports, and other publications.

In addition to academic evaluation, it is necessary to obtain external evaluation of the First Phase research in relation to the goals of IGES, such as the goal of drafting of innovative policy recommendations. It is also important that Second Phase research and decisions about the future direction of IGES be based on the evaluations of the First Phase results.

This report summarizes the achievements of the First Phase, along with evaluations by the IGES Research Advisory Committee, governmental organizations, and other related organizations and individuals.

2. Evaluation by external experts[1]

Evaluation of the methodologies and results of the strategic research conducted in the First Phase was carried out by external experts, in preparation for the Second Phase of strategic research.

Three evaluations took place: (1) evaluation by the fifteen Research Advisory Committee members, nominated by research institutes that were signatories of the Charter of the Establishment of IGES, to provide supervision and

[1] See Attachments 1 to 3 for the evaluators and questionnaire respondents.

advice on research conducted at IGES in general; (2) evaluation in light of decision-making processes by ten representatives of national governmental and international organizations that also signed the IGES Charter, as well as other international organizations, and (3) a questionnaire-style evaluation by eleven representatives from environmental organizations, NGOs, and mass media for input from various fields. The results of the external evaluations of each project are summarized in Section 3. Below is a summary of the evaluation of all the First Phase projects as a whole.

2.1 Evaluation by Research Advisory Committee Members

Members of the Research Advisory Committee provided a range of comments on the project themes. One member commented that IGES should not be too ambitious, since it is a new research institute and its resources are limited. On the other hand, another member commented that IGES should deal with wider and more comprehensive themes, and conduct research with a vision to social development.

Regarding research methodology, one comment pointed out the tendency that case studies were not conducted systematically, and that there was a need to build logical frameworks, as well as a need to implement appropriate analytical methodologies, such as quantitative analysis.

Concerning project management, most comments asked for strengthening of the networks with external experts and research organizations, and for increasing cooperation between projects within IGES.

In general, it was pointed out that even though the First Phase was successful in gaining positive evaluation as a basis for the Second Phase Research Plan, there should be appropriate policy analysis and coordination with decision making processes and policy makers, comprehensive and coordinated research results of the IGES projects, or results that have more focus according to need.

2.2 Evaluation by national governmental, international and other organizations concerned

In general, the program was evaluated as solid, well planned, and useful in examining global environmental issues. International organizations said that IGES' reports, etc., were useful as basic reference materials for projects or drafting policy proposals. However, governmental organizations indicated that they desire research results related to more practical research, policies, and strategies. They also pointed out the necessity of strengthening the networks within research organizations, etc., in Japan and Asia and carrying out joint research.

2.3 Evaluation by other external stakeholders

Overall, the evaluations may be considered as good, but some are harsher, compared to those by the Research Advisory Committee members or related organizations.

Some evaluators gave grades of C (average) or D (poor), because they thought that IGES had not networked sufficiently with NGOs and international negotiations, and has had little influence on external stakeholders in forming domestic policies.

3. Outline of the First Phase project research

Climate Change Project

1. Outline of the project

Background

One of the largest tasks the world faces in the realization of a sustainable society is the issue of climate change, caused when the expansion of human's activities threatens the stability of the climate. Therefore, scientific examination by the Intergovernmental Panel on Climate Change (IPCC) has been taking place, and measures based on the agreement of the parties of the United Nations Framework Convention on Climate Change (UNFCCC) are being promoted.

Purpose of research

The Climate Change Project has been carried out under the project leadership of Dr. Shuzo Nishioka, with the purpose of analyzing policies to respond to climate change, and to make concrete policy proposals based on the analysis. This has been carried out in correspondence to the international negotiations concerning the parties of UNFCCC and the Kyoto Protocol. Developments have been achieved in the areas of forming a global framework, local cooperative efforts centering on the Asia-Pacific region, and climate change countermeasures in each country in the region.

Research theme and results

The project carried out research on the utilization of the Kyoto Mechanisms, market-based methods based on the Kyoto Protocol, as international countermeasures to address climate change. Work included research on the direction for the Clean Development Mechanism (CDM) and a summary of experiences gained through Activities Implemented Jointly (AIJ), as well as research on their implementation. The results of this were disseminated at meetings of the Conference of the Parties (COP) of the UNFCCC and at international workshops.

Furthermore, through an evaluation of the economic effects of the CDM using the IGES' Green house Gases (GHG) Emission Model (IGEM), investigations were conducted on environmental cooperation mechanisms in the Asian region and international funding mechanisms to induce the participation of developing countries.

The project made proposals on domestic policies regarding flexibility measures in the Kyoto Protocol related to designing the emissions trading system. CP held the "IGES Open Forum to Address Global Warming Countermeasures," and facilitated an exchange of opinions between related parties. The results were compiled and then widely disseminated at international conferences, such as the COPs.

In addition, the project also conducted a comparative analysis of "best practices" in the climate change countermeasures of the G8 countries, made contributions to the IPCC including its preparation of the Third Assessment Report (TAR), and carried out activities such as improving the accuracy of GHG inventories of each nation in the Asian region and constructing a network of experts of inventories.

Conclusion

During the first phase of IGES' research, in response to the progression of international policymaking processes that took place, the Climate Change Project made many timely proposals that contributed to the policymaking process, both internationally and domestically. It also established a basis for long-term research by developing original methodologies, such as the Regional Energy or Environmental Model. Network-building among international and domestic researchers or stakeholders also took place. The IGES Climate Change Project is now recognized both internationally and domestically as a core research center on the climate change issue in Japan and the Asian region, and many invitations to major international research projects or to international conferences have been received as a result. From these outcomes, it can be said that the project has fully executed the original research plan.

2. Internal evaluation of the project

Originality: The project applied unique analysis tools, made proposals, and performed analysis in a number of fields related to climate change. In particular, it established research themes which allowed comprehensive policy proposals to be made and research methods which make use of networking.

Achievements: Research was carried out smoothly, within the limits and schedule decided at the outset, and upwards of fifty research outcomes were published. However, due to the challenges of keeping up with the rapidly-changing process of international policy debate and a shortage of researchers, presentations to academic seminars were few. Also, the project was unable to respond to the issue of carbon dioxide "sinks." Nevertheless, as a result of its research and outreach activities the project is now recognized worldwide.

Project Management: In general, the project was managed smoothly, but the fact that the project leader was not present full-time meant that issues arose relating to a lack of leadership in research and gaps between researchers and the management of researchers visiting from overseas such as those who came under the Eco-Frontier Fellowship program.

3. Comprehensive summary

Evaluation by the Research Advisory Committee Members

With regard to management of the project, comments were similar to those made in the internal evaluation, but in general the project was evaluated to have in a short time demonstrated leadership in the Asia-Pacific region as an information center concerned with climate change issues. However, there were also suggestions that the project should participate more actively in carrying out action plans both within Japan and internationally.

Evaluation by national governmental and international organizations, and other external stakeholders

The project was highly evaluated with respect to the appropriateness of the research themes and methods. However, a higher level of contribution to international community with regard to the policymaking process was requested. As a general comment, the results of the First Phase were evaluated as being very good.

Conclusion

The accomplishments of the Climate Policy Project in the First Phase have been recognized and appreciated by experts in this field. In particular, the project was judged to have set appropriate targets and to have achieved most of them, contributing to the policymaking process and the global research community on climate change issues. As implementation of the Kyoto Protocol will become a critical issue as a result of COP-7, it will be essential to face this new issue with a concrete action plan and focused policies at national, regional, and international levels in the Second Phase Strategic Research.

Urban Environmental Management Project

1. Outline of the project

Background

In eastern Asia, including Japan, Korea, China, and ASEAN countries, rapid urbanization and industrialization at the end of the twentieth century have brought material wealth to Asian cities, but at the same time, have caused environmental problems. Research is needed to improve the situation and to respond to structural changes in the types of future environmental problems, as well as to solve global-scale environmental problems.

Purpose of research

The final objective of this project was to present innovative ideas and models that will guide urban environmental management policies in the midst of economic development in Asia in the twenty-first century. Another objective was to discuss the applicability and transferability of Japanese models to other cities in Asia through analysis of experiences in Japan. For these purposes, the project, under the leadership of Dr. Hidefumi Imura, conducted research in collaboration with IGES' Kitakyushu office, which was set up in October 1999 with support from the city of Kitakyushu.

Research theme and results

Based on the above considerations, the project identified four study areas: (1) a comparative study of past experience, the current situation, and mechanisms of urbanization and environmental problems in Asian cities; (2) cities in industrial transformation: past experience and new models for urban development and environment in Japan; (3) strategies for improving urban infrastructure: mass transportation, sewerage, waste management, and water and electricity supply; and (4) strategies for improving governance in urban environmental management.

For actual work, the project synthesized research findings of the above four areas into seven sub-themes, as described here:

a. Current status, process, and mechanisms of urban environmental change in Asia: Research teams were set up in eight Asian cities (three from China, two from Korea, two from Japan, and one from Indonesia) and case studies were conducted. The "driving force-pressure-state-effect-response" (DPSER) framework was adopted for this study as a common framework for conducting case studies in order to present a stage model of urban environmental evolution.

b. Comparative studies of urban environmental management in Asia: The need for sound environmental governance was identified, along with other needs.

c. Japanese experience in environmental management: From Japanese experience, results that may be applied to other Asian countries were found, including collective actions by all actors in environmental governance.

d. Financing for urban environmental infrastructure (UEI): Proposals were made, including the need for funding from the private sector, according to the conditions of each nation.

e. A comparative study was conducted on urban transportation and air pollution in four Asian mega-cities (Tokyo, Seoul, Beijing, and Shanghai). Issues identified included the need for construction of public transportation systems.

f. Urban solid waste management in East Asia: A conclusion was reached that the emphasis must be on a comprehensive impact assessment of waste treatment.

g. Comparative study on urban environmental governance in East Asia: Points that should be considered in order to improve environmental governance were identified, such as clarification of the role of government at national and local levels.

In addition, the Urban Environmental Management Project organized five symposia, starting in February 2000, aimed at producing results which can be used for the Ministerial Conference on Environment and Development in Asia and the Pacific of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). The results of the symposia were compiled as the "Kitakyushu Initiative for a Clean Environment," which was adopted at the conference, along with the decision that it would be implemented by ESCAP, etc.

Conclusion

In the first phase of the study, the project tried to present an overall picture of the major issues of environmental management in diverse cities. The major findings of this project provided several policy implications for sustainable urban environmental management in Asia.

First, it can be said that many urban environmental problems in the region occur as a result of insufficient urban infrastructure. Second, "eco-partnership" should be encouraged, inviting broader participation. Third, enhancing urban environmental governance is of crucial importance. And fourth, mass transportation systems such as railways and subways should be encouraged. Cities that have had a late start are urged to carry out proactive policies based on the experience and precedents of the countries mentioned above.

2. Internal evaluation of the project

Originality: The research was original in that the entire study consisted of comparative studies of case study cities on each environmental issue (horizontal studies) to identify commonalties and specialties of cities under different conditions, using the data and information collected from each case study city (vertical case studies).

Achievements: The research has demonstrated that urban environmental problems are caused not only by economic factors, but also by social, institutional, and political factors. As a new approach with broader and more comprehensive perspectives, the project developed a new multi-dimensional assessment model.

Project Administration and Management: The project was successful in developing an international network of researchers. However, an efficient system of data management and project coordination must be further developed in the Second Phase. The budget scale was considered appropriate, but the balance between the internal work and external activities that were commissioned needs to be discussed seriously in the future.

3. Comprehensive summary

Evaluation by the Research Advisory Committee Members

Even though the research plan, achievements, and management were evaluated highly, the following points were made. A more integrated approach must be developed. There is a need for the project to expand its research scope to other socioeconomic and political terms, and there should be special emphasis on highlighting the role of local initiatives in improving urban environmental management. On the last point, it was decided that the "Kitakyushu Initiative for Clean Development" should receive high priority in the Second Phase.

Evaluation by national governmental and international organizations, and other external stakeholders

Even though the project's achievements were evaluated highly, it was expected that the priority of second phase studies should be policy analysis and the formulation of strategic proposals, rather than purely academic research.

Conclusion

In order to provide comprehensive examination of urban environmental management in Asia, the project conducted research unique in several aspects. For example, the project took into account major urban environmental problems in socioeconomic, institutional, and political dimensions, analyzed current urban environmental problems in a consistent manner by applying a common analytical framework (such as using a stage model), and developed strategic options to enhance the implementation of actual urban environmental management. In addition, in-depth analyses on current urban environmental management practices were enabled by conducting case studies and by hosting workshops, using international networks.

In the Second Phase, the project expects to respond to more issues, including the development of an integrated approach to urban environmental assessment, attention on local initiatives of urban environmental management, and the priority of strategic proposals for multiple urban environmental stakeholders.

Forest Conservation Project

1. Outline of the project

Background

The conditions relating to forest issues have not improved in recent years, in spite of the fact that there have been many international attempts to confront the problem of forest destruction, which is caused by many factors, such as excessive logging. The situation calls for the creation of a global-level forest conservation strategy and establishment of actual methods for its domestic implementation.

Purpose of research

Under the leadership of Mr. Hiroji Isozaki, this project sought to prepare a strategy for the conservation and sustainable management of forests in Asia and the Pacific region, and to propose the necessary supporting legal measures and policies, as well as basic elements to be included in action plans needed at the international level.

Research theme and results

The project conducted survey research with four sub-teams: "Structural Analysis of Regional Forest Destruction and the Underlying Causes of Deforestation and Degradation of Forests," "Participatory Forest Management," "Timber Trade Policy to Support Sustainable Forest Management," and "Legal and Administrative Supporting Measures for Sustainable Forest Management." Each sub-team conducted research to measure and analyze the actual state of forest use and management in Asian countries through field surveys, conducted in collaboration with networks of researchers and members of governmental organizations, etc., both within and outside Japan.

Through the above process, the following points were found. First, the project identified the "external constraints" on local participation in forest management in the target countries. Second, the project identified the economic, social, and cultural "internal constraints" in the local communities. Third, the "possible main actors" were clarified by evaluating the local realities and national forest policies. In addition, the project identified the lessons learned from public participation in developed countries.

The results of the research were closely examined at four international workshops and through policy dialogues with governmental representatives. They were compiled and presented to interested parties as policy proposals concerning forest conservation in Indonesia, Lao P. D. R., Vietnam, the Philippines, and Far-East Russia.

Conclusion

In the First Phase, the project attempted to identify principles and measures for sustainable forest management, based on experiences in the Asia-Pacific region. From various activities of the project, many valuable achievements were obtained, including the "IGES Policy Recommendation on Forest Conservation in the Asia-Pacific."

2. Internal evaluation of the project

Originality: The project set up four unique sub-themes to respond to the complexity of forest issues, at the same time as conducting comprehensive research. Among various forest-related stakeholders, the project placed great importance on local people, with special reference to their participation in forest management.
Achievements: Achievements were made by each of the sub-teams. For example, the sub-team on Structural Analysis of Regional Forest Destruction and the Underlying Causes of Deforestation and Degradation succeeded in addressing the key underlying causes of forest loss in the region, which is comprised of both producer and consumer countries, including the Northeast Asia sub-region. In addition, the project has tried to disseminate its research outputs and exchange information at international conferences and workshops organized by IGES. The project has tried especially to contribute to discussions of government officials in each country by distributing a report summarized by the project concerning current issues of forest conservation and their future directions.

Project Administration and Management: Most of the activities were conducted successfully. However, the project could not conduct enough case studies on the impact of overseas investment on forest loss because it was difficult to find appropriate research collaborators.

The budget allocation was utilized very efficiently for the networking of research collaborators, etc., and funding from outside was utilized.

3. Comprehensive summary

Evaluation by the Research Advisory Committee Members

The overall evaluation by the Research Advisory Committee was that the project was successful in terms of tight focus, good themes, and clear structure. On the other hand, the focus on international issues may have excluded the viewpoints of some stakeholder groups. The policy outputs from the project were highly prescriptive and included little consideration of policy as process.

Evaluation by national governmental and international organizations, and other external stakeholders

It was evaluated that the theme and approach of the project was appropriate. As for the evaluation on the project's contribution to the international community, however, the results were satisfactory but did not lead to concrete proposals.

Conclusion

The purpose of the project's First Phase activities was to assess the actual local situation of forests and

forestry in the Asian region, without placing limitations on the level and methodology or plans to propose concrete actions and guidelines in the Second Phase. Following discussions at meetings, including the meeting of the board of directors, however, it was recommended that the project be based on the promotion of participatory forest management at the local level through suitable national measures.

In general, the evaluation by outside experts does not differ greatly from the internal evaluation made by the project. Some evaluations showed different views that reflect the broadness and complex nature of forest issues, and many points were raised, showing the need to carry out further research.

In the Second Phase, further improvement of the project is expected, based on the examinations mentioned above.

Environmental Education Project

1. Outline of the project

Background

The aim of environmental education has been modified to emphasize "education for sustainability," which has broad implications for development, poverty, population, and gender. Through this approach, it is expected that environmental education will promote environmentally sustainable societies throughout the Asia-Pacific region.

Purpose of research

The purpose of the Environmental Education Project was to promote and foster eco-consciousness in relation to an environmentally sound and sustainable society, and the wise use of resources in the Asia and Pacific region. Under the leadership of Prof. Osamu Abe, the Environmental Education Project identified two aims to achieve this purpose: (1) to develop a comprehensive regional strategy on environmental education, and (2) to establish an international network to implement an environmental education strategy in the Asia-Pacific region in order to improve the quality of the environment.

Research theme and results

Collection and analysis of status reports on environmental education were carried out with the cooperation of researchers and specialists in 36 countries and special areas. Through this process, successful examples of environmental education and current conditions of regional cooperation were identified, as well as problems such as the lack of national policies concerning appropriate environmental education.

The project conducted case studies on business and industries, NGOs, the media, and higher education, which have important roles to play in fostering environmental education and public awareness in the region. As a result, for example, in order for business and industries to promote environmental education in the region, suggestions were made to develop in-house capacity building and promote green consumerism.

Based on these points, discussions at the "Regional Workshop on Environmental Education in the Asia-Pacific" were compiled as a "Regional Strategy on Environmental Education in the Asia-Pacific," and then submitted to related organizations in the area. The main objective of the strategy is to promote and foster eco-consciousness in relation to an environmentally sound and sustainable society based on partnership. The strategy identified the following five-action agenda items:

1. Strengthen the capacity of stakeholders
2. Develop partnerships for collaborative work
3. Improve curriculum and program development
4. Facilitate improved governance for environmental education
5. Mobilize external assistance

Based on these, the project contributed to international joint projects in the Asia-Pacific region, including the China, Korea, and Japan Tripartite Environmental Education Network Project.

Conclusion

The project was successful in clarifying the status, problems, issues, and general directions of environmental education in the Asia-Pacific region through a three-year comprehensive assessment and sector-based research activities. In addition, business and industry, non-governmental organizations, the media, and higher education were all recognized as important actors in implementing environmental education in its broadest context. However, this comparative study found great differences in the design of environmental education systems in the region. It was also found to be important that international cooperation relating to environmental education be basically concerned with technology transfers.

In addition, the "Regional Strategy on Environmental Education in the Asia-Pacific," formulated by the project, is an initial attempt to define a strategy for the entire region, and intended to be comprehensive enough to apply to the entire region. It is expected that it will be revised in the future to adapt to changing circumstances, so that environmental education may be organized and managed effectively. The project was able to contribute to the development of environmental education networks.

2. Internal evaluation of the project

Originality: The most original aspect of the project is its broad view of several sectors for environmental education, such as business and industry, NGOs, and the media. There were other original outputs, such as the preparation of status reports on different countries and regions, and the formulation of the Regional Strategy on Environmental Education in the Asia-Pacific.

Achievements: The research started with humble beginnings as an assessment of country needs in relation to environmental education, and led to the formulation of a regional strategy. The strategy will be ready to move ahead to actual implementation, based on principles of reciprocity in partnership with national agencies and organizations. The building of networks was also a great achievement, but integration of research activities across the sectors was difficult to coordinate; this needs to be addressed in the future.

Project Administration and Management: The project was successful in managing its activities in an interactive-cum-participatory style. On the other hand, there were areas needing improvement, such as the lack of integration of the four sectors (business and industries, NGOs, the media, and higher education) in defining the problems of environmental education, or the lack of a concrete action plan.

3. Comprehensive summary

Evaluation by the Research Advisory Committee Members

The compilation of 36 status reports and the formulation of the Regional Strategy on Environmental Education in the Asia-Pacific were evaluated as having been appropriately undertaken.

On the other hand, the need was pointed out for further investigation of the strategy and integrated evaluation of environmental education according to each sector (business and industries, NGOs, the media, and school education). At the same time, it was also pointed out that concrete plans, etc., for finding mutual relations among different sectors should be improved.

Evaluation by national governmental and international organizations, and other external stakeholders

The project was evaluated as being successful in providing an overall status report of environmental education in the Asia-Pacific region. It focused on and was successful in information dissemination, strategy development, and regional networking. It was pointed out that it would be interesting to undertake regional comparative studies and get a global perspective on environmental education.

Conclusion

The First Phase of the project was highly evaluated by the external reviewers. Strengths included the use of participatory techniques and collaborative partnerships, even given its limited amount of manpower and budgetary constraints. The combination of the four areas, because of their unique strength in promoting

environmental education, was also given a high rating.

On the other hand, the evaluators also had some suggestions concerning how the four areas (sectors) could be combined, and on concrete action plans, etc., for regional strategies. By using these evaluation findings as guidelines for the project in the Second Phase, the project hopes to enhance eco-consciousness in the region at all levels—local, national, sub-regional, and regional.

Environmental Governance Project

1. Outline of the project

Background

Environmental governance deals with how societies deal with environmental problems. It is concerned with understanding the structures and functions of social systems and rules regarding environmental problems. In the twenty-first century, the Asia-Pacific region, with its economic development and increase in population, is expected to have a great influence on the global environment. It is thus critical to examine the nature of environmental governance in the region.

Purpose of research

The main objective of the Environmental Governance Project is to analyze major issues of environmental governance and to present concrete policy recommendations relevant to the Asian region.

Research theme and results

Research on three themes was carried out under the project leadership of Dr. Hisakazu Kato.

1. Comparative study of national environmental governance: National studies were conducted on environmental governance mechanisms in nine major countries in Asia, focusing on their process and organizational bodies that conduct environmental governance. The current state of development and the implementation of environmental policies in Asian countries were observed and evaluated. As a result, policy recommendations were made that included a recommendation to establish a regional network to monitor and review the status of environmental policy development and implementation in Asian countries, and to widely disseminate the information and data obtained through various channels, including mass media and the Internet.
2. Regional and sub-regional programs for environmental cooperation: Analyses on issues such as legislative history, modality of cooperation, and priority areas were conducted for each of the three sub-regions, such as Southeast Asia. As a result, it became evident, for example, that a multi-layer structure with weak institutional/financial structure and a membership consisting of countries of various statuses was found in Northeast Asia.
3. Business and environmental governance: A study group of corporate environmental governance in Japan was launched, focusing on the experience of Japanese private enterprises in environmental governance. The discussions of this group were later published in book form. It became clear that now there is an observable trend toward attempts and initiatives to deal with environmental issues through voluntary commitments and self-governance, including certification and observance of the ISO14000 series of environmental management standards.

Conclusion

Included among the findings of the country studies are some policy recommendations, such as to strengthen institutions and/or legal provisions for improving the effectiveness of environmental governance. But most of these proposals require further in-depth analyses under the prevailing conditions of each country or the region as a whole.

Further studies are needed on the relationship between national capacities for environmental governance and

the processes of globalization in general, and political democratization, decentralization, and the ongoing revolutions in information technology and biotechnology.

2. Internal evaluation of the project

Originality: The Environmental Governance Project is a rather rare, if not unique, example of strategic research, whereby the entire range of processes, actors, and institutions involved in environmental governance are treated as a system and policy proposals have been developed to improve the design and operation of that system. In view of the fact that there was little precedent of the comparative analysis on regional environmental cooperation program in Asia before the project team undertook one, the findings and conclusions of the research project will be of assistance to policymakers in understanding regional/sub-regional environmental cooperation, and in considering future steps to be taken to strengthen such cooperative programs, mechanisms, and institutions.

Achievements: Country studies were conducted in nine countries—Japan, China, India, Thailand, Bangladesh, Indonesia, Malaysia, the Philippines, and Korea. After presentation and synthesis of the findings of the nine-country studies at an international symposium held in March 2000, policy recommendations on the direction of environmental governance were compiled in fiscal year 2000. Furthermore, a book entitled "Business and Environmental Governance" was published (Chuo Hoki Publishing Co.) in Japanese.

Project Administration and Management: The results obtained are satisfactory as a product of the very first phase of development and application of both methodologies and tools necessary for an analysis of a very complex and cross-cutting issue like environmental governance, and for elaborating policy guidelines and recommendations. Also, it was quite successful in producing its expected outputs, particularly in terms of building a network of research institutes and researchers within and outside Asia working in the area of environmental governance.

3. Comprehensive summary

Evaluation by the Research Advisory Committee Members

All the targets set up by the Environmental Governance Project appear to have been met. The project produced a number of important achievements in assembling a new and important baseline of essential information and data, including the results of the country case studies. However, it was highlighted that there was little in the way of more detailed analysis of issues for improving environmental governance, because the overall goals of the project were perhaps overly ambitious.

Evaluation by national governmental and international organizations, and other external stakeholders

Although the importance and appropriateness of the subject of environmental governance was affirmed, it was pointed out that there needs to be a much sharper focus and originality of approach. It was also pointed out that the past activities of the project have not contributed sufficiently to the international community in making concrete and practical proposals for improving environmental governance.

Conclusion

To summarize the evaluation of the First Phase results, there is a need for a more focused approach to analyzing the specific conditions which would be needed to yield any useful results in the Asian region and to be able to make concrete and practical policy recommendations.

In the Second Phase, a new project on Long Term Perspective and Policy Integration (LTP) will be formulated, integrating the Environmental Governance (EG) Project with the New Development Patterns (NDP) Project. The new project is expected to produce many results by making use of the research network and other assets that has been developed by the Environmental Governance Project during its First Phase.

New Development Patterns Project

1. Outline of the project

Background

In recent years, many developing countries in Asia have been experiencing high rates of economic growth by introducing material-intensive production and consumption patterns based on throw-away economy. This accelerating trend of globalization and the fast development of information technology enhances the problems associated with current development patterns on a global scale.

Purpose of research

Under the leadership of Mr. Kazuo Matsushita, the New Development Patterns (NDP) Project conducted research surveys while collaborating with the other five IGES projects. The purpose of the project included study of the issues to be considered in searching for "new development patterns" that are necessary to transform existing economic and social systems into more environmentally friendly and sustainable ones, research on the development and transfer of technologies for developing countries, and to make proposals to international conferences such as the Environmental Congress for Asia and the Pacific (ECO ASIA).

Research theme and results

Study sessions were held to identify issues regarding new development patterns, and the results of discussions were published in a book titled "Environment in the 21st Century and New Development Patterns" (Japanese version from Chuo Hoki Publishing Co. in Japanese; English version from Kluwer Academic Publishers). For study of the transfer of environmentally sound technologies, examples from "Least Developed Countries" (LDCs) were focused. The project pointed out that the efforts of local people for self-help should be respected in the application of technology transfer and cooperation with these countries and regions. For ECO ASIA and the Ministerial Conference on Environment and Development (ESCAP/MCED) held in Kitakyushu in August 2000, a conference document was submitted, entitled "Policy implications in addressing critical environment and sustainable development issues of the region." The document emphasized that strategic investment, policy integration, partnerships, and improvement of environmental awareness were essential elements in order to shift towards the direction of new development patterns. Furthermore, for the G8 Environment Ministers' Meeting in April 2000, the project contributed to the discussion by analyzing and summarizing the issues, including poverty and environment. The project also published a book, "Business and Environmental Governance," in cooperation with the Environmental Governance Project.

Regarding information technology (IT) and the environment, a formal study was launched with the hosting of an international workshop held jointly with the Wuppertal Institute for Climate, Environment, and Energy of Germany. Also, the project set up a study group on IT and the environment with Nikkei Business Publications (Nikkei BP), which met periodically.

Conclusion

Considering that the NDP Project started late in fiscal year 1998 with limited resources for implementation, the achievements of the project have been satisfactory so far. In the future, the following steps will be necessary. First, continue to undertake cross-cutting and long-term studies and try to integrate various policies at sector-specific levels, with participation and input from other IGES strategic research projects. Second, examine some of the emerging key issues, such as the issue of information technology and environment, to attain new development patterns and conduct in-depth studies on these issues. Third, collect and analyze basic data for sustainable development in the Asia-Pacific region in order to make innovative policy proposals.

2. Internal evaluation of the project

Originality and Achievements: The unique accomplishments of the project include the publication of "Environment in the 21st Century and New Development Patterns" and "Business and Environmental

Governance," the compilation of a report titled "Transfer of Environmentally Sound Technologies," as well as the reporting of policy proposals to ECO ASIA, and summarizing discussion points for the G8 Environment Ministers' Meeting. Some pioneering research was conducted on IT and the environment, as well.

Project Administration and Management: The accomplishments mentioned above were achieved, despite some obstacles with the administrative management of the project, including factors such as the late start of the project compared to other IGES projects, and that there were only a few research staff members and transfers of members.

3. Comprehensive summary

Evaluation by the Research Advisory Committee Members

The project was satisfactory as a start, but in order to achieve its objectives, it was recommended that activities be more concentrated and human resources reinforced. It was also pointed out that the project's scope should be more focused, and that collaboration with researchers, etc., abroad should be enhanced.

Evaluation by national governmental and international organizations, and other external stakeholders

Although the theme of the project was evaluated as being important and appropriate, it was pointed out that it should produce research achievements to put forward towards the 2002 World Summit on Sustainable Development (WSSD) at the appropriate time. It was also emphasized that since the themes addressed by the project are broad and ambitious, there is a need for a tighter focus and more originality in the methodology.

Conclusion

The project was started later than the other IGES projects, with an aim to study a cross-cutting, wide range of issues. In the Second Phase, the project has been integrated with the Environmental Governance (EG) Project, and has made a new start as the Long-Term Perspective and Policy Integration (LTP) Project. This new project is expected to make policy recommendations with a long-term perspective and cross-cutting approach.

Capacity Building Program

1. Outline of the project

Background

A clear need exists for capacity building, as well as learning and training programs, relating to sustainable development and the environmental conservation in the Asia-Pacific region. The demand for capacity building is high, but common problems are faced by capacity building organizations, including a lack of personnel and funds to implement effective educational and training programs on a consistent, planned basis.

Purpose of the program

Capacity building is one of the four functions of IGES. The aim of capacity building is to train researchers, etc., who deal with global environmental issues in regions and countries, especially developing countries in the Asia-Pacific region.

Program activities and approaches

The program started its activities under program manager Mr. Glen Paoletto. At the beginning, a series of interviews and surveys of officers of governments, private companies, and educational organizations were undertaken in order to assess the needs of capacity building in the Asia-Pacific region. As a result, it was decided that emphasis should be placed on capacity building by "eLearning," making use of the Internet, in addition to organizing conventional-style workshops and accepting interns.

The eLearning system consists of eLearning management software and eCourse (online courses) authoring

software, available to the public on a Web site set up exclusively for capacity building (http//www.iges.net). A total of eight software programs, including eLearning management software, were developed in both English and Japanese versions, and seven eCourses, including "ISO14001 Implementation," were completed as online content.

In addition, the program hosted workshops and accepted interns from a program offered by LEAD International (Leadership for Environment and Development).

Conclusion

The program developed a unique eLearning system which makes use of the Internet, despite many constraints, including those on budgets and human resources. In the future, it is planned to develop capacity building projects strategically, in collaboration with related organizations, for further application of the eLearning system for capacity building. In the Second Phase, there is a need to develop monitoring and evaluation systems of eLearning in order to evaluate online programs.

4. Research Support System

For the smooth and effective promotion of research activities at IGES, the secretariat, especially the research support section, has been undertaking various activities to support its research. It has also been preparing a suitable environment for research activities. Estimating from the budget and the number of staff members, the following calculations were made. The total expenses allocated for "Expenses for Promotion of Projects" by the six research projects in the general account during the three-years of the First Phase was 1670.6 million yen, which was 64.3% of the total expenditure (2597.4 million yen). For "General and Administrative Expenses", 628.4 million yen (24.2%) was allocated. And some 298.3 million yen (11.5%) was allocated for other expenses. Regarding the number of staff members, there was a total of 40 research staff and 35 secretariat staff (including research secretaries) at the end of the First Phase (as of March 2001).

The major research support activities include the organization of forums and seminars, publication of research reports and other publications, public relations activities, the receiving of researchers from abroad, collection of research reference materials and books, and provision of an information search system.

5. Second Phase Strategic Research Program and the expectations of IGES

The Second Phase Strategic Research Program was adopted at the Board of Directors meeting in February 2001 after being reviewed by the Advisory Group, an advisory body to the Chair of the Board of Directors, and by the IGES Program Planning Group, which consists of IGES board members, and by boards of directors and trustees. The Second Phase research will be conducted in line with three basic concepts: (1) it will be based on the research results of the First Phase, (2) IGES will conduct research that may be directly connected to practical and problem-solving style policy proposals, according to the need of target stakeholders, taking well into account that IGES is a research institute that conducts strategic research, and (3) when doing so, IGES projects should mutually exchange information, and proceed with research through cooperation.

The Second Phase research should be conducted on the basis of the following nine tasks. The four existing projects—Climate Change, Urban Environmental Management, Forest Conservation, and Environmental Education—should be re-examined and expanded. In addition, the New Development Patterns Project and the Environmental Governance Project of the First Phase will be integrated and re-named the "Long-term Perspective and Policy Integration Project" and the "Business and the Environment Projects," respectively. Furthermore, projects on the themes of the "IT (Information Technology) Revolution and the Environment," "Environmental Industries," and "Freshwater Resources Management in Asia" are expected to begin after consideration of the budgets required and other factors. In addition, the Capacity Building and Communication programs will be expanded.

The Second Phase research began in April 2001 as a three-year plan, in principle. From comments on the Second Phase from Research Advisory Committee members, governmental/international organizations, and external stakeholders, there was an expectation that IGES should continue work to build comprehensive and wide networks, and conduct research that has a large influence on policymakers concerned with sustainable

development, in cooperation with developing countries and NGOs. Consideration must be given to improving research management systems and the distribution of research results.

6. Conclusion

IGES is currently conducting its first year of work in the Second Phase. In future, it hopes to expand its strategic research, by taking into account its achievements and evaluations from the First Phase and considering comments from its Research Advisory Committee members and external stakeholders. Furthermore, IGES will establish mid- and long-term work plans, including its further institutional internationalization. IGES hopes to execute research related to the global environment and other activities from a neutral standpoint, and with mid- and long-term perspectives in mind. Based on these activities, IGES wishes to contribute to international community in making efforts, including WSSD, to achieve sustainable development.

Note: Further information on IGES First Phase Strategic Research is provided on the IGES web site. <http://www.iges.or.jp>

Comprehensive Report of the First Phase Strategic Research

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I

Evaluation of the First Phase Project Research

Evaluation of the First Phase Project Research

IGES Secretariat

1. Introduction

Evaluation of methodologies and results of strategic research conducted in the First Phase was carried out by external specialists. The results of the evaluations are to be put to use for the strategic research of the Second Phase.

Three evaluations took place: (1) evaluation by the Research Advisory Committee members, nominated by signatory research institutes of the Charter of the Establishment of the Institute for Global Environmental Strategies (IGES) for the purpose of giving supervision and advice to research conducted at IGES in general; (2) evaluation by representatives of national administrative (governmental) and international organizations that are signatories of the IGES Charter and other international organizations, from a point of view relating to decision making processes, and (3) questionnaire style evaluation by eleven representatives from environmental organizations, NGOs, and mass media, to receive evaluations from a variety of fields.

2. Outline of Evaluation Methods

2.1 Evaluation by Research Advisory Committee Members

Evaluation by the Research Advisory Committee members was conducted according to Form 1. Six projects of the First Phase were evaluated, each project being evaluated by 2 to 4 Research Advisory Committee members (see Attachment 1). The evaluations were conducted by grade evaluation and evaluation by free description in four fields: research plan, achievements, project management, and general evaluation. Also, an overall evaluation of the First Phase Research (grade evaluation of excellent, good, average, poor, and unsatisfactory and evaluation by free description) and comments for the Second Phase Strategic Research Program were collected from the Research Advisory Committee members as well.

A total of 20 members of the Research Advisory Committee, including supporting researchers of the members, conducted the evaluation, and the decision about which members were to evaluate which project took into account the wishes of the members as well as his or her field of specialization and interest. The Institute of Strategic and International Studies (ISIS) Malaysia kindly conducted an evaluation of all projects.

2.2 Evaluation by national governmental, international and other organizations concerned

Evaluation by national governmental, international and other organizations concerned was conducted according to Form 2. Along with grade evaluation and comments about the propriety of research themes and degree of contribution to international society, etc., descriptions of the theme most closely related to each organization, the contribution of the IGES research results to drafting of policies, and an overall evaluation were added. In addition, expectations for the Second Phase Strategic Research Program and for the future of IGES were gathered.

All national governmental (11) and international (4) signatory organizations were asked to conduct the evaluation. In response, four national governmental organizations (Attachment 2) and three international organizations sent replies. In addition, the Organization for Economic Cooperation and Development (OECD), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and Japan Bank for International Cooperation (JBIC) sent their evaluation. Of the organizations that sent replies, the United Nations University sent evaluations of UE, FC, EE, EG and NDP projects, and Japan's Ministry of the Environment sent evaluations for all the projects.

2.3 Evaluation by other external stakeholders

As for evaluation by other external stakeholders, question forms made by simplifying evaluation formats used by international organizations, etc., as in Form 3, were sent to environment-related groups, NGOs, and the mass media in Japan. Evaluation for each project and IGES First Phase Strategic Research as a whole, and opinions and expectations for the Second Phase and future of IGES activities were gathered.

Of the 40 groups and individuals to whom the question forms were sent, ten environment related groups and a journalist (Attachment 3) sent replies. Depending on the interests of the groups and the individual, some replies concerned all projects while others concerned only specific projects.

3. Summary of Evaluation Results

Details of the evaluation of each project by Research Advisory Committee members and other organizations and individuals, are listed under the section on Summary of the projects along with comments by Project Leaders. Thus, evaluation results of all First Phase Projects as a whole are mentioned here.

3.1 Evaluation by Research Advisory Committee Members

A summary of evaluation results is shown in Table 1. For most items, evaluations are relatively good. A summary of comments is provided below.

Table 1: General Evaluation of the First Phase Strategic Research Plan as a Whole

Items	A	B	C	D	E	Note
Appropriateness of themes	4	5	1	0	0	
Appropriateness of research methodologies	4	6	1	0	0	
Project management	4	6*	1**	0	0	including A-B,**B-C
General evaluation of research results	5	4	2**	0	0	

A: Excellent B: Good C: Average D: Poor E: Unsatisfactory

a. Appropriateness of the project theme

- IGES was able to make a good start as a new institute in the Asian region with the six projects, whose themes are excellent and timely, all worthy of working on (TERI, IISD, MERI, IDS,TDR).[1]
- However, it is not clear if they were suitable to a new and small institute without strong capability and credibility as IGES and if IGES was able to add any new and meaningful results to the existing research (IDS, ISEAS).
- As an institute in the Asian region where most countries are at the developing stage, IGES should include the view of social development in the context of environment (APCEL).
- Some of the projects lack the precise links with relevant social groups and process (IIED).
- There should be some broad and comprehensive themes as a basis of the IGES strategic researches (SJFC).

[1] The full names of the organizations are shown in Attachment I.

b. Evaluation of project methodology

- Focusing on strategic research is a wise decision (PIK).
- As a basis of the case studies and comparative studies, theoretic framework needs to be further applied (KEEI, TDRI).
- Most projects need to focus on selected issues of high priorities (MERI).
- Most projects, excluding CC, employed unstructured case studies without little quantitative analysis, resulting in less attention to economic and financial feasibility of alternative policy regimes (IDS).
- Efforts to have locals and various outsiders involved in the FC research should be highly recommended (APCEL).
- Although the methodology and approaches are adequate, further efforts were needed in the execution of the project (ISEAS).
- How to apply more pertinent analytical tools in the study should be further considered (SFJC).

c. Evaluation of management and administration

- The network formed and knowledge gained in the First Phase should be maintained and expanded (IISD).
- The linkage between projects could have been made more apparent. Isolation of researchers within the institute might have been a problem (PIK, IIED).
- IGES needs to work together with the good outside experts, especially in the case of the research work commissioned by outside organizations. This would enhance the capability of young researchers at IGES (APCEL).
- Visiting researchers from overseas institutes should have been incorporated into the project research more efficiently (APCEL).
- For some projects, a co-leader system may help meeting any contingencies that might arise (APCEL).
- It is advisable to prepare a list of cross-cutting issues in all areas of the research and have a seminar to compare the results at the end of the research (APCEL).

d. General evaluation of results of the IGES First Phase Research Program

- In general, the First Phase of IGES was successful with some constructive contribution to the global environmental research with some important networks and inter-institutional linkages having been established. The research went well in so far as it is a base for the Second Phase (PIK, IDS).
- To become a really influential research project over a long time, it is very important to link itself to the policy making process and continuously engage itself effectively with stakeholders of various levels (IISD).
- Many research results are not based on careful and adequate policy analyses (MERI).
- To gain the reputation as a world-class research institute, IGES needs to focus on its research and try to make one or two major outputs with greater precision (IDS).
- Links into policy process, particularly the national and sub-national levels and outside the government sector were less clear (IISD).
- More focus should be made on an integrated approach and assessment of the different projects (ISEAS).
- IGES needs to have clearly focused and demand driven output (TERI).

Regarding the themes of projects, there was a comment that IGES should not be so ambitious since it was a new research institute and that its resources were limited. On the other hand, there was a comment that IGES should deal with wider comprehensive themes, and conduct research with a vision to social development.

Regarding research methodology, there was a comment pointing out the tendency that case studies was not conducted systematically, and that there was a need to build logical frameworks and for the implementation of appropriate analysis methodologies such as quantitative analysis.

Concerning the management of projects, most comments asked for strengthening of networks with external specialists and research organizations, and for increasing cooperation between projects within IGES.

In general, it was pointed out that, even though the First Phase was successful in gaining a positive evaluation as a basis for the Second Phase Research Plan, there should be appropriate policy analysis and coordination with decision making process/policy makers, comprehensive and coordinated research results of the IGES projects, need for more focused and demand-driven achievements with a view to possible decrease in the number of projects.

3.2 Evaluation by national governmental, international and other organizations concerned

a. Research projects that attracted most interest

Summaries of replies from eight organizations are shown in Table 2 (there were multiple replies), excluding those of the United Nations University Institute for Advanced Studies (UNU/IAS) and the Ministry of the Environment of Japan (MoEJ), which sent replies for all projects. Because a limited number of organizations sent replies, it may not be considered a general tendency, but it seems that projects of Climate Change, Urban Environmental Management, and Environmental Governance have attracted most interest.

Table 2: First Phase Research Projects that attracted most interest from national governmental and international organizations

Name of Project	Number of Organizations	Name of Organizations that sent replies
CC	4	UNITAR, CAN. OECD, JBIC
UE	4	UNCRD, CAMB. ESCAP, JBIC
FC	1	CAMB.
EE	2	CAN, MON.
EG	3	UNITAR, CAN. JBIC
NDP	2	CAMB. JBIC

UNITAR: United Nations Institute for Training and Research, CAN.: Ministry of Environment of Canada, OECD: Organization for Economic Cooperation and Development, JBIC: Japan Bank for International Cooperation, UNCRD: United Nations Center for Regional Development, CAMB.: Ministry of Environment of Cambodia, ESCAP: Economic and Social Commission for Asia and the Pacific, MON.: Ministry of Nature and the Environment of Mongolia

b. Usefulness of research results for national governmental and international organizations

Although only a few organizations sent evaluation comments, the following may be gained by summarizing the comments.

International organizations sent the evaluation that IGES reports and other outputs, were useful as basic reference materials for projects or drafting of policy proposals. From national governmental organizations such as the Ministry of the Environment of Japan, quite a number of comments were sent. With a few exceptions, such as in the case of Climate Change, the comments show they expect to receive results that may be more directly connected to proposals of concrete policies or strategies.

c. General evaluation of the IGES First Phase Strategic Research Program

- In general, the program was evaluated as concrete and well planned, and useful when examining global environmental issues. But the following points were highlighted as the points to be discussed in future.
- Although IGES research results may be used as basic references, as mentioned above, research results that may be directly connected to more practical research, policies and strategies are needed (MoEJ).
- IGES should strengthen networks with research organizations in Japan and other Asian countries, and conduct joint research (UNU/IAS), for example, it may be suggested to establish a focal point for research in each country or cooperation/participation of research institutes/researchers with various backgrounds (MON).
- There is a need to establish a field of research, where IGES has comparative strength (UNU/IAS).
- IGES might have dealt with wider social and economic issues such as the issues of corruption (UNCRD).

3.3 Evaluation by other external stakeholders

a. Research projects that are most related to, or that may attract most attention, and the ones that were useful or seem to be useful in the future.

As shown in Tables 3 and 4, external stakeholders that sent replies had more interest in and found useful the projects of Climate Change, Urban Environmental Management, Environmental Governance, and New Development Patterns.

However, it should also be kept in mind here that replies were sent by only a limited number of external stakeholders.

Table 3: First Phase Research Project that are related to or attracted most interest from external stakeholders

Name of Projects	Number of Organizations	Names of Organizations that sent replies
CC	6	KEF, GEF, FoE, JICA, WWFJ, TK
UE	4	KF, KEF, OECC, GEF,
FC	2	GEF, FoE
EE	2	KEF, GEF,
EG	4	KF, GEF, FoE, SACEP
NDP	2	KF, GEF

KF: Global Environment Forum-Kansai, KEF: Kansai Economic Federation, CASA: Citizens' Alliance to Save the Atmosphere and the Earth, OECC: Overseas Environmental Cooperation Center, Japan, GEF: Global Environmental Forum, FoE: Friends of the Earth, Japan, JICA: Japan International Cooperation Agency, WWFJ: WWF Japan, TK: Mr. Keizo Takeuchi, SACEP: South Asia Co-operative Environment Programme

Table 4: First Phase Research Projects that were useful or seem to be useful in the future for external stakeholders

Project Names	Number of Organizations	Names of organizations that sent replies
CC	4	KEF, CASA, TK, WWFJ,
UE	3	KF, KEF, OECC,
FC	1	FoE
EE	0	
EG	4	KEF, KF, CASA, SACEP
NDP	4	KEF, KF, TK, JICA

b. Evaluation of First Phase Research Results by External Stakeholders

The results of grade evaluation are shown in Table 5. Overall evaluation may be considered as good, but there is greater variety in evaluation compared to that by the Research Advisory Committee members or related organizations.

The harsh grades of C (average) or D (poor) were received because IGES lacks networking with NGOs and international negotiations, and has little influence towards external stakeholders in forming domestic policies. There is a need to improve on these points in future.

Table 5: General Evaluation

	A (Excellent)	B (Good)	C (Average)	D (Poor)	E (Insufficient)
No. of Cases	1	4	1	2	0
	GEF, SACEP	KEF, OECC, JICA, WWFJ	CASA	TK, FoE	

Evaluation of the First Phase by the outside stakeholders are summarized as follows:

- IGES makes its existence recognized, and is accomplishing its goals (GEF).
- It has not yet reached the stage where IGES can make an impact on practical international negotiations or on domestic policies (TK).
- Production of more concrete research results is expected (JICA).
- Policy proposals putting weight on environmental concern are expected (WWFJ).
- IGES is doing well with a small number of researchers (OECC).
- Cooperation and involvement with NGOs should be strengthened (CASA).
- IGES is expected to become an organization that can express its opinions to the government of Japan (FoE).
- Although IGES research focuses on the Asia-Pacific region, the research area of most of the IGES projects is limited in their geographic coverage within the region (SACEP).

4. Comments for the Second Phase Strategic Research Program and Future Activities of IGES

The Second Phase Strategic Research Program was adopted by the Meeting of the Board of Directors held in February 2001, after being reviewed by the Advisory Group which is an advisory body of the Chair of the Board of Directors, and by the IGES Program Planning Group consisting of board members of IGES, and by the Boards of Directors and Trustees. The Second Phase research will be conducted under basic concepts shown below:

1) It will be based on research results of the First Phase,
2) IGES will conduct research that may be directly connected to practical and issue-oriented style
3) policy proposals, according to the need of target stakeholders, taking well into account that
4) IGES is a research institute that conducts strategic research,
5) When doing so, IGES projects should mutually exchange information, and proceed with
6) research through cooperation.

The Second Phase research should be conducted based on the following nine themes. The four existing projects (Climate Change, Urban Environmental Management, Forest Conservation, and Environmental Education) should be reexamined and expanded. In addition, the New Development Project and Environmental Governance

Project of the First Phase have been integrated and reformed as “Long-term Perspective and Policy Integration Project” and “Business and the Environment Project”.

Furthermore, the projects on themes of IT Revolution and the Environment, Environmental Industries, and Freshwater Resources Management in Asia are expected to begin after considerations on necessary budgets and other condition. In addition, the programs of Capacity Building and Communication will be expanded. The Second Phase research began in April 2001, as a three-year plan, in principle.

From comments for the Second Phase sent by all three groups of Research Advisory Committee members, national governmental/international organizations and external stakeholders, there was an expectation for IGES to build comprehensive and wide networks, and conduct research that has more influence over policy makers concerning sustainable development, through cooperation with developing countries and NGOs. There is also expectation for improving research management systems and distribution of research results.

4.1 Comments by the Research Advisory Committee

On the whole, the general comments by the Research Advisory Committee (RAC) members were as follows:

a. Research themes

- It is important to work towards policy formulation through practical research (IIED, TEI, IDS).
- Issue oriented research is important (KEEI, IGI, APCEL).
- Cross-cutting, inter-disciplinary and comprehensive research is essential (TRDI).
- Research which is focused and which considers the usability of resources should be carried out (IISD).
- Attention must be paid to environmental sustainability, social justice, economic productivity and cultural diversity (ISIS-NDP).
- Research should be carried out on international trade, multi-national enterprises, politics, social systems and inequality as obstacles to sustainable development (WI).
- The new projects on Freshwater Resource Management and Business and the Environment are important. (PIK, ISIS-EG, TEI).

b. Research methodologies

- It is first of all essential to establish a framework for fundamental socio-economic and environmental research (TDI, TDRI).
- The scope of each research item (for example domestic, Asia-Pacific or global scope) should be made clear (KEEI).
- Importance should be placed on consultation with concerned parties (consultative approach) (ISIS, NDP), in particular, dialogue with policy decision-makers (NIES). Also, involving the parties concerned in research from the outset is important (IIED), and local initiatives should be seen as important (SJFC).
- An interdisciplinary approach is important (ISIS-FC).
- Comprehensive, country-specific research is also crucial (TDRI).
- It is essential that appropriate analysis be conducted, including quantitative analysis, such as research which uses comparable parameters (ISIS-UE, NDP).
- Cooperation with existing research networks such as IPCC and IHDC and also signatory organizations is important (APCEL).
- Linkages with ECO ASIA, ESCAP and UNEP are important (ISIS-UE), as is contributing to the international negotiations on forestry (IIED). How to respond to the outcomes of WSSD to be held in Johannesburg should also be considered (IISIS-EG).

- Overlap, both within IGES and without, must be avoided (APCEL). For this reason, a review of existing research is essential (KEEI).
- Study and training activities and a communication program are also important (SJEC, TEI, ISEAS).

c. Research system

- In order to establish a study and training program for young researchers (NIES) and joint research, the improvement of researchers' communication skills is essential (IIED).
- As the resources of IGES are limited, outsourcing of a part of research can be considered (KEEI).
- Research plans can be over-ambitious and management can become a burden. It is therefore essential to scrutinize research plans (IISD, IDS).
- Case studies should be carried out according to a research plan and on schedule based on a strategy (TERI).
- It is essential to carry out the whole plan properly (WI).
- Because communication between researchers is important, the role of a project liaison manager is important (IISD), in particular, attention must be paid to avoid overlapping (ISIS-EE).
- Linkages between projects should also be clearly stated in reports and publications (PIK).
- Criteria should be established for evaluating the contribution to IGES made by researchers, in connection with and consideration of IGES's mission (NIES).

d. Research results

- It is essential to produce tangible output (IDS).
- A clear strategy for disseminating research results is essential (ISEAS) and it is important that they are disseminated to influential individuals, in particular (NIES).

4.2 Comments by national governmental, international and other organizations concerned

Subjects for discussion in the Second Phase research or in the future can, if looked at in general terms, be assimilated in the following manner:

- Carrying out Second Phase research based on the results of First Phase research will be a good strategy (UNITAR). In the light of international developments, it is important to fuse appropriately the First Phase projects and the Second Phase research which deals with new themes (OECD).
- How to appropriately carry out the plan will be important from now on (ESCAP).
- More action-oriented and issue-oriented research should be carried out by combining policy analysis and strategic proposals (UNITAR, ESCAP) and positive policy proposals should be carried out (Ministry of the Environment of Japan (MoEJ).
- While doing so, the feasibility of policy/strategy proposals should be examined, and how local and national case studies can be best applied internationally should be investigated beforehand (MoEJ).
- The targets people of proposals should also be made clear (UNITAR).
- In order to use effectively the limited resources available, overlap should be avoided. To this end, the exchange of information and cooperation should take place both within IGES and with outside bodies. Outsourcing is one possibility for consideration (UNCRD).
- In joint research with developing countries, consideration should be given to technological and financial support (CAMB).
- Methods for quantitative evaluation of the results of research should be investigated (MoEJ).

As regards the future research activities of IGES, the national governmental and international signatory organizations of the IGES Charter provided the following comments:

- Research should be carried out which strikes a good balance between the contradictory aims of having cooperation between programs and carrying out focused, tangible research (UNITAR).
- Research should be carried out through truly international cooperation based on networking and partnership (UNITAR, UNU/IAS). Moreover, the results of this ought to be of use, particularly to policy decision-makers in Asia and the Pacific (CAMB).
- It is important to construct an overall framework for cooperation, in order to strengthen cooperation with developing countries in particular (UNCRD). This will also be useful for the transfer of knowledge and technologies.
- Attention should be paid to the extensive effects on the social and economic aspects of various environmental policy and strategy projects aiming at sustainable development, which is different from administrative surveys (MoEJ).
- Research should be carried out on sustainable consumption and production, indicators and a framework for analysis towards sustainable development as well as on the evaluation of ecosystems, etc. (UNU/IAS).
- Contributions to international fora such as the World Summit on Sustainable Development (WSSD), the Environmental Congress for Asia and the Pacific (ECOASIA) and the Asia Pacific Economic Cooperation forum (APEC) should be continued and strengthened (CAN, ESCAP).
- Research should be carried out on the implementation of environmental treaties both in Asia and the Pacific and in the world, the problem of desertification and the possibility of CDM in developing countries, etc. (MON).
- In order to realize sustainable development, it is important for IGES to continue to provide high quality publications (OECD).
- Proposals and research results should be aimed not only at government and international agencies, but at a wide variety of targets including industry, NGOs and the general public (MoEJ). Also, attention should be paid to dissemination of information related to Japan where IGES is located (JBIC).
- Also training programs should be continued and strengthened, based on investigations carried out well in advance, making practical use of eLearning etc. and catering for various levels (UNITAR, UNU/IAS).

4.3 Comments on the Activities of IGES in the Second Phase or Hereafter by External Stakeholders.

Comments on the activities of IGES in the Second Phase or hereafter can be summarized as follows.

- Widely disseminating and publicizing research outcomes is essential (KEF). Especially dissemination to the relevant stakeholders of the local, national and sub-regional level (SACEP).
- Practical research is expected (KF).
- Because it is based in Japan, IGES is expected to make policy proposals to the governments and the industries and to be a strategic research institute which will guide Japanese society (TK, WWFJ). Furthermore, the fact that the arguments of Japan at international conferences are often obscure and difficult to be understood should be made known within Japan by IGES (WWFJ).
- Research in cutting edge fields of technology such as biotechnology is expected (KEF).
- Research into corruption and illegal deforestation is expected (FoE), as well as that into development of forest which does not lead to environmental destruction, energy conservation and CDMs for renewable energy (WWFJ).
- Collaboration with NGOs is important (CASA). The selection of research themes should also reflect the opinions of NGOs and citizens' groups (FoE).
- Further collaboration with support organizations such as JICA are expected (JICA).

- Positive proposals and strengthening international networks are expected (GEF), as is close cooperation with developing countries (WWFJ).
- The system for selecting and evaluating researchers should be improved (TK).
- Development of training program is also expected (JICA).
- The coverage of South Asian countries and their involvement seems to be limited. Through collaboration with IGES, the potentiality of this region is expected to increase and there will be broader participation of stakeholders. This also leads to strong capacity building in this region.

Attachment 1

Evaluators of the Research Advisory Committee (RAC)

Climate Change Project:

Dr. Jin-Gyu OH, KEEI
Dr. William Glanville, IISD
Prof. Martin Claussen, PIK
Ms. Norhayati Mustapha for Mr. Philip Mathews, ISIS Malaysia

Urban Environmental Management Project:

Dr. Edda Muller for WI
Dr. Leena Srivastava, TERI
Dr. Guang XIA, SJFC
Ms. Norhayati Mustapha for Mr. Philip Mathews, ISIS Malaysia

Forest Conservation Project:

Dr. Sonja Vermeulen, IIED
Ms. Wan Portiah Hamzah for Mr. Philip Mathews, ISIS Malaysia

Environmental Education Project:

Dr. Joti Parikh, IGI
Dr. Tongroj Onchan for TEI
Ms. Norhayati Mustapha for Mr. Philip Mathews, ISIS Malaysia

Environmental Governance Project:

Dr. Keith Bezanson, IDS
Dr. Koh Kheng Lian, APCEL
Dr. Tsuneyuki Morita, NIES
Ms. Wan Portiah Hamzah for Mr. Philip Mathews, ISIS Malaysia

New Development Patterns Project:

Dr. Chia Lin Sien, ISEAS
Dr. Chalongphob Sussangkarn, TDRI
Ms. Wan Portiah Hamzah for Mr. Philip Mathews, ISIS Malaysia

APCEL: Asia Pacific Center for Environmental Law
IDS: Institute of Development Studies
IGI: Indira Gandhi Institute of Development Research
IIED: International Institute for Environment and Development
IISD: The International Institute for Sustainable Development
ISEAS: Institute for Southeast Asian Studies
ISIS: Institute of Strategic and International Studies Malaysia
KEEI: Korea Energy Economics Institute
MERI: Mekong Environment Research Institute
NIES: National Institute for Environmental Studies
PIK: Potsdam Institute for Climate Impact Research
SJFC: Sino-Japan Friendship Center for Environmental Protection
TEI: Thailand Environment Institute
TERI: Tata Energy Research Institute
TDRI: Thailand Development Research Institute
WI: Wuppertal Institute for Climate, Environment and Energy

Attachment 2

Evaluators of International and Administrative Organizations

Signatory International Organizations

United Nations Institute for Training and Research

United Nations Institute for Advanced Studies

United Nations Center for Regional Development

Signatory National Administrative Organizations

Ministry of the Environment of Japan

Ministry of Environment of Cambodia

Ministry of Environment of Canada

Ministry of Nature and the Environment of Mongolia

Other International Organizations

Organization for Economic Cooperation and Development

United Nations Economic and Social Commission for Asia and the Pacific

Japan Bank for International Cooperation

Attachment 3

Questionnaire Respondents

Organizations

Global Environment Forum - Kansai

Kansai Economic Federation (KEF)

Citizens' Alliance to Save the Atmosphere and the Earth (CASA)

Overseas Environmental Cooperation Center (OECD)

Global Environmental Forum (GEF)

OISCA

Japan International Cooperation Agency (JICA)

Friends of the Earth Japan (FoE/Japan)

World Wildlife Fund For Nature Japan (WWF Japan)

South Asia Co-operative Environment Programme (SACEP)

Person

Mr. Keiji Takeuchi, Editorial Writer, Science, Environment, Asahi Shimbun

Form 1

Evaluation of the First Phase Projects by RAC members

Date: _____ **Project:** _____ **Evaluator:**_____

5.1 Project Evaluation

1) Project Plan		
a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	(1)*	(2)*
b. Appropriateness of the research plan for accomplishing the targets		
c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)		
2) Project Achievements		
a. Accomplishment of targets of major research achievements		
b. Originality and practicability of research results (in comparison with existing research level)		
c. Contributions to academic, social, or administrative arena and contributions to the international community		
d. Influence over policy-making process		
e. Accomplishment of targets in activities such as hosting of workshops etc.		
f. Effectiveness and efficiency of activities		
g. Dissemination of research results		
3) Project Management		
a. Activity, management and budgeting of the project		
b. Appropriateness of scheduling		
c. Effectiveness and efficiency of distribution of personnel and financial resources		
4) General Evaluation of the Project		
a. General evaluation of the projects as a whole		
b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved		

5.2 General Evaluation of the First Phase Strategic Research Plan as a whole

a. Appropriateness of project themes dealt by IGES in the First Phase Strategic Research Program (e.g. whether it responded to the social needs)		
b. Evaluation of Project Methodology towards research		
c. Evaluation of management and administration of the Project Research		
d. General evaluation of results of the IGES First Phase Strategic Research Program		

5.3 Comments on the Second Phase Strategic Research Program

Note: Evaluation Criteria

Each item should be graded into five levels, represented by a letter of the alphabet (A-E).

* Comments should be filled-in in the column (2) and the criteria in the column (1).

A: Excellent

B: Good

C: Average

D: Poor

E: Unsatisfactory

Signature: _____ Date: _____

Form 2

Evaluation of the First Phase Projects

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS	GRADE		COMMENTS
a-1 Appropriateness of project themes dealt by IGES in the First Phase Strategic Research Projects (e.g. whether it responded to the social needs)	CC:		
	UE:		
	FC:		
	EE:		
	EG:		
	NDP:		
a-2 Appropriateness of project approach to project themes	CC:		
	UE:		
	FC:		
	EE:		
	EG:		
	NDP:		
a-3 Contribution to the international community	CC:		
	UE:		
	FC:		
	EE:		
	EG:		
	NDP:		
b. Most interesting/relevant project themes to you			1.CC 2. UE 3. FC 4. EE 5. EG 6. NDP
c. Usefulness of research results to your organization (if any, possible impacts on policies of your organization)			
d. General evaluation of activities of the IGES First Phase Strategic Research Program			

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

Note:

Evaluation Criteria

Each item should be graded into five levels, represented by a letter of the alphabet (A-E).

A: Excellent
B: Good
C: Average
D: Poor
E: Unsatisfactory

II. Comments on the Second Phase Strategic Research Program (Please refer to the attachment)

(Theme, methodology, timing, expected achievements, etc.)

III. Expectation to IGES in the future

(Theme, expected role of IGES, possible future activities, etc.)

Signature: _____ Date: _____

Form 3

First Phase Project Questionnaire

Name: _____ Title: _____

Organization: _____

I. Comments on and grading of the 1st phase projects

* Please put the grade in the parenthesis [ ]
* The names of the projects were abbreviated in the way shown below.
  CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

1. What do you think of the project themes dealt by IGES in the First Phase Strategic Research Projects? Did they respond to the social needs?

CC:[ ]:

UE:[ ]:

FC:[ ]:

EE:[ ]:

EG:[ ]:

NDP:[ ]:

2. What do you think of the project approach to the project themes? Are they appropriate in dealing with the theme?

CC:[ ]:

UE:[ ]:

FC:[ ]:

EE:[ ]:

EG:[ ]:

NDP:[ ]:

3. How much contribution do you think IGES projects made to the international community?

CC:[ ]:

UE:[ ]:

FC:[ ]:

EE:[ ]:

EG:[ ]:

NDP:[ ]:

4. Which project theme is most interesting/relevant to your organization?
1.CC 2.UE 3.EE 4.FC 5.EG 6.NDP

5. Is there any research results of IGES that is/was useful to your organization? [Project name:]
How useful are/were they ? [Grade:]

6. How do you grade the IGES 1st Phase Projects as a whole? [Grade:]

Note:

Evaluation Criteria

Each item should be graded into five levels, represented by a letter of the alphabet (A-E).

A: Excellent
B: Good
C: Average
D: Poor
E: Unsatisfactory

II. Comments on the Second Phase Strategic Research Program and Expectation to IGES in the future (Please refer to the enclosed "IGES Strategic Program for the Second Phase")
[Theme, methodology, timing, expected achievements, expected role, etc.]

Signature: _____ Date: _____

Evaluation by the Research Advisory Committee (RAC) members (CC)

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS		GRADE					
		A	B(B+, B-)	C	D	E	NA
1)Project Plan	a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	3	1				
	b. Appropriateness of the research plan for accomplishing the targets	1	3				
	c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)	2	1				1
2) Project Achievements	a. Accomplishment of targets of major research achievements	2	2				
	b. Originality and practicability of research results (in comparison with existing research level)	3	1				
	c. Contributions to academic, social, or administrative arena and contributions to the international community	3	1				
	d. Influence over policy-making process	3	1				
	e. Accomplishment of targets in activities such as hosting of workshops etc.	4					
	f. Effectiveness and efficiency of activities	2	2				
	g. Dissemination of research results	3	1				
3) Project Management	a. Activity, management and budgeting of the project		3				1
	b. Appropriateness of scheduling		1		1		2
	c. Effectiveness and efficiency of distribution of personnel and financial resources		3				1
4) General Evaluation	a. General evaluation of the projects as a whole	4					
	b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved	2	2				

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

Evaluation by the Research Advisory Committee (RAC) members (UE)

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS		GRADE					
		A	B(B+, B-)	C	D	E	NA
1)Project Plan	a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	4					
	b. Appropriateness of the research plan for accomplishing the targets	2	2				
	c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)	1	3				
2) Project Achievements	a. Accomplishment of targets of major research achievements	2	2				
	b. Originality and practicability of research results (in comparison with existing research level)	2	1	1			
	c. Contributions to academic, social, or administrative arena and contributions to the international community	1	2	1			
	d. Influence over policy-making process		2	2			
	e. Accomplishment of targets in activities such as hosting of workshops etc.	1	3				
	f. Effectiveness and efficiency of activities	1	3				
	g. Dissemination of research results		3				
3) Project Management	a. Activity, management and budgeting of the project		3				1
	b. Appropriateness of scheduling	1	2				1
	c. Effectiveness and efficiency of distribution of personnel and financial resources		3				1
4) General Evaluation	a. General evaluation of the projects as a whole	2	2				
	b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved	1	3				

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

Evaluation by the Research Advisory Committee (RAC) members (FC)

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS		GRADE					
		A	B(B+, B-)	C	D	E	NA
1)Project Plan	a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	1		1			
	b. Appropriateness of the research plan for accomplishing the targets	1	1				
	c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)	1	1				
2) Project Achievements	a. Accomplishment of targets of major research achievements	1	1				
	b. Originality and practicability of research results (in comparison with existing research level)		1		1		
	c. Contributions to academic, social, or administrative arena and contributions to the international community		2				
	d. Influence over policy-making process		1		1		
	e. Accomplishment of targets in activities such as hosting of workshops etc.	1	1				
	f. Effectiveness and efficiency of activities	2					
	g. Dissemination of research results		1	1			
3) Project Management	a. Activity, management and budgeting of the project	1	1				
	b. Appropriateness of scheduling	1	1				
	c. Effectiveness and efficiency of distribution of personnel and financial resources	1	1				
4) General Evaluation	a. General evaluation of the projects as a whole		2				
	b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved	1	1				

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

Evaluation by the Research Advisory Committee (RAC) members (EE)

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS		GRADE					
		A	B(B+, B-)	C	D	E	NA
1)Project Plan	a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	2	1				
	b. Appropriateness of the research plan for accomplishing the targets		3				
	c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)		2	1			
2) Project Achievements	a. Accomplishment of targets of major research achievements		3				
	b. Originality and practicability of research results (in comparison with existing research level)	1	2				
	c. Contributions to academic, social, or administrative arena and contributions to the international community	1	2				
	d. Influence over policy-making process		1	2			
	e. Accomplishment of targets in activities such as hosting of workshops etc.	1	2				
	f. Effectiveness and efficiency of activities		3				
	g. Dissemination of research results		3				
3) Project Management	a. Activity, management and budgeting of the project	1	2				
	b. Appropriateness of scheduling		3				
	c. Effectiveness and efficiency of distribution of personnel and financial resources	1	2				
4) General Evaluation	a. General evaluation of the projects as a whole		3				
	b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved	1	2				

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

Evaluation by the Research Advisory Committee (RAC) members (EG)

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS		GRADE					
		A	B(B+, B-)	C	D	E	NA
1)Project Plan	a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	1	3				
	b. Appropriateness of the research plan for accomplishing the targets	1	2	1			
	c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)	1	3				
2) Project Achievements	a. Accomplishment of targets of major research achievements	1	1	2			
	b. Originality and practicability of research results (in comparison with existing research level)		2	2			
	c. Contributions to academic, social, or administrative arena and contributions to the international community	1	2	1			
	d. Influence over policy-making process	1		2	1		
	e. Accomplishment of targets in activities such as hosting of workshops etc.	3	1				
	f. Effectiveness and efficiency of activities	1	2	1			
	g. Dissemination of research results	1	2	1			
3) Project Management	a. Activity, management and budgeting of the project		2	2			
	b. Appropriateness of scheduling		3		1		
	c. Effectiveness and efficiency of distribution of personnel and financial resources		3	1			
4) General Evaluation	a. General evaluation of the projects as a whole		3	1			
	b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved		3		1		

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

Evaluation by the Research Advisory Committee (RAC) members (NDP)

I. General Evaluation of the First Phase Strategic Research Plan as a whole

ITEMS		GRADE					
		A	B(B+, B-)	C	D	E	NA
1)Project Plan	a. Appropriateness of the targets set up by the project (e.g. responding to social needs)	1	2				
	b. Appropriateness of the research plan for accomplishing the targets		1	2			
	c. Appropriateness of the research methods (e.g. academic survey, field survey, quantitative analysis)		1	1	1		
2) Project Achievements	a. Accomplishment of targets of major research achievements		1	2			
	b. Originality and practicability of research results (in comparison with existing research level)			3			
	c. Contributions to academic, social, or administrative arena and contributions to the international community		1	2			
	d. Influence over policy-making process		1	1	1		
	e. Accomplishment of targets in activities such as hosting of workshops etc.	1	1	1			
	f. Effectiveness and efficiency of activities	1	1	1			
	g. Dissemination of research results	1	2				
3) Project Management	a. Activity, management and budgeting of the project		3				
	b. Appropriateness of scheduling	1	2				
	c. Effectiveness and efficiency of distribution of personnel and financial resources			3			
4) General Evaluation	a. General evaluation of the projects as a whole		1	2			
	b. Reality, efficiency, effectiveness of the measures in reaching the target, what extent the project targets were achieved			3			

CC: Climate Change Project, UE: Urban Environmental Management Project, FC: Forest Conservation Project, EE: Environmental Education Project, EG: Environmental Governance Project, NDP: New Development Patterns Project

II

Results and evaluation of the First Phase Projects Research

Climate Change Project

Shuzo NISHIOKA

Project Leader

1. Outline of the Project

1.1 Background

The issue of climate change is an important challenge that humanity faces as it tries to move towards sustainable societies. A stable climate is crucial for life on earth, and the life and ecosystems we now see have developed under relatively stable climatic conditions. However, the expansion of human activity has now begun to destroy this stability.

In 1990, the Intergovernmental Panel on Climate Change (IPCC), composed of several thousand international scientists, compiled existing knowledge of and analysis on the climate change issue and submitted its first assessment report. The report warned the world about the alarming possibility of global warming in the next one hundred years and stated that the range of the effects will be extremely broad, with impacts on entire ecosystems, water resources, agriculture, and the well-being of humanity. It also indicated that the reduction of greenhouse gas (GHG) emissions, which cause global warming, would be quite difficult, due to their relation to energy use and agriculture.

The United Nations Framework Convention on Climate Change (UNFCCC) was signed at the United Nations Conference on Environment and Development in 1992 and came into effect in 1994. The actual implementation of the provisions in the convention was to be decided in a protocol, and in December 1997 the Kyoto Protocol was adopted at the third session of the Conference of the Parties (COP-3). Through this Protocol, the international community made some initial steps towards mitigating global warming.

The international negotiation process is, however, proceeding with difficulty due to differences in the opinions of developed and developing countries. COP-6 was unable to produce a conclusion on the details of the Kyoto Protocol, and was postponed until the spring or summer of 2001.

Developed countries' reduction targets as set in the Protocol are still far from what is required for stabilization of the climate. At the same time, however, the IPCC warned in its Third Assessment Report that climate change caused by human activity is advancing. It is essential to draw up a reduction plan which can achieve international agreement.

The most important issue in climate change policy is the development of domestic measures to achieve national reduction targets, and this has a strong connection with the international framework. The participation of developing countries is indispensable, and this is related to the world trade order and policies for development assistance. It can be said that the climate change issue is the foremost challenge in moving towards a sustainable world and an urgent task that deeply affects progress towards a sustainable society.

1.2 Goal and targets

a. Objective

The aim of this research project is to propose a concrete climate policy based on policy analysis that includes climate change-related communication with stakeholders. Additionally, we aim to stay ahead of progress on the UNFCCC, and to develop a framework over a whole range of climate change countermeasures, applicable to national, regional, and global cooperation to address climate change, particularly in the Asia-Pacific region.

b. Research

The Project started and implemented its research by making proposals to contribute to the design of the Kyoto Mechanisms, regional cooperation mechanisms in Asia, and the formation of each country's domestic policy measures, according to the process of negotiation of a climate change framework followed since the Kyoto Protocol. The Project also participated in IPCC activities to consolidate scientific findings and constructed a researchers' network for a greenhouse gas inventory in the Asian region.

This project started four months after the formal adoption of Kyoto Protocol in December 1997. The participants at COP-3 agreed on reduction targets of developed countries on the final day of the meeting. Agreement was reached to allow international cooperative mechanisms (the Kyoto Mechanisms), including joint implementation, emissions trading, and

the clean development mechanism (CDM), etc. Details of the mechanisms were entrusted to future conferences of the Parties and UNFCCC Subsidiary Body (SB) meetings. Therefore, during the first year of our project the most urgent international task was to contribute to the design of the Kyoto Mechanisms. It was recognized that the following are important issues which should be agreed upon at COPs: the design of the emissions trading market among the Annex I countries, the design of joint implementation, taking into account the "hot air" (the excess emission allowances over "business-as-usual" [BAU] emissions) in Russia, and setting up a framework of the CDM which aims to reduce GHG emissions in developing countries.

The setting of baselines is one controversial point in analyzing the effects of the Kyoto Mechanisms, needed in order to have standardized methods to evaluate the effects of these reduction measures. In 1998, the Buenos Aires Action Plan was adopted at COP-4 in order to elaborate on the details of the Kyoto decisions. The details were left to be decided at COP-6 in 2000.

During the ensuing period, the following issues were actively discussed in the field of international climate policies: proposals concerning concrete design of the mechanisms; the search for actual projects of joint implementation; reduction of uncertainties related to the CDM in Non-Annex I countries and evaluation; and the possibility of Annex I countries achieving their targets based on the above-mentioned issues.

To achieve the emission reduction targets of developed countries, one of the important key issues is to ascertain how to assess the sequestration of carbon by terrestrial ecosystems such as forests and soil. The UNFCCC requested the IPCC to assess the volume of sinks from a physical point of view and how the emission reduction levels of each country could be reasonably calculated. The IPCC submitted a special report on sinks in June 2000, which showed that without a concrete definition of forests or management activities, countries would report great differences in the volume of sinks used to calculate emission reductions; this problem created controversy in the international policy discussions leading up to COP-6.

The GHG emissions from developing (Non-Annex I) countries are expected to exceed the amount emitted by developed (Annex I) countries in the next ten years. Hence, the reduction of emissions in developing countries is a pressing need. To realize emissions reductions, it is hoped that at the earliest stage developing countries will incorporate policy measures for global warming mitigation into their long-term economic development plans.

To support this it is also necessary to accelerate technological transfers from the developed countries and to construct communication channels and capacity building in developing countries. One of the main issues faced by the UNFCCC is how to enhance technology transfers effectively by utilizing existing bilateral assistance or multilateral funding mechanisms, such as the Global Environment Facility (GEF). As for the CDM, it is regarded as a prospective measure that could help realize both technology transfers and GHG emissions reductions. It is necessary to assess the economic effects of its implementation in the Asian region.

Taking into account the growing economies of populous countries, such as China and India, it is certain that the Asian region will become a huge emissions source. This means that concrete analyses of the extent of reductions possible in each country are essential, and efforts must be made to ascertain the level of reductions that can be achieved by regional cooperation.

After COP-3, each country was to start full-scale *domestic policy measures* to achieve emissions reduction targets. In particular, European nations established GHG emissions reduction policy measures, which included regulation, carbon taxes, and voluntary action plans in industrial sectors.

In Japan, a sectional reduction plan was prepared at the time of the examination of the Kyoto Protocol in 1997. However, emissions have been increasing and there is need for additional policy measures. To control emissions from sources scattered thinly among many sectors, policy formation under national consensus is essential. Thus, there is a need to create the opportunity for such policymaking with public participation.

The task of the IPCC is to accumulate and evaluate knowledge from the physical and social sciences in order to form the policy measures mentioned above. This work, which started in 1988, involves the ongoing writing of special reports on topics such as technology transfers, emissions scenarios, regional impacts, and carbon sequestration, in response to requests from the UNFCCC after the IPCC's Second Assessment Report was released in 1995. The Third Assessment Report, which has been under preparation since 1997, was published in 2001.

The third report provides more accurate information for future policymaking work related to the UNFCCC. The amounts of national *GHG emissions* reported to the UNFCCC Secretariat are calculated by guidelines prepared by the Inventory Task Force of the IPCC. The Technical Support Unit (TSU) of the Inventory Task Force has been located at IGES since 1998. The TSU is accumulating scientific information from many countries in order to more comprehensively estimate

emission amounts from various sources. The units of emission amounts differ greatly depending on regional conditions. Therefore, it is essential to consolidate the results of measurements by the network of scientists from many countries and many fields. This kind of effort at the regional level has been assisted by the United States, Japan, the European Union, and international organizations such as the GEF.

1.3 Method and approach

Research activities of this project have been carried out in parallel with developments of the UNFCCC, and its research results have contributed to various decision-making processes. The details of research results of each topic will be discussed in the next section.

Scientific level: Assessment of the research results of physical and social sciences concerning the climate change issue. Contributions to the IPCC (emissions scenarios, technology transfers, vulnerability assessments)

⬇

International negotiations: UNFCCC processes, analysis of international negotiations after COP-6, designing elements of Kyoto Mechanisms such as baselines, joint implementation, and emissions trading

⬇⬇

Regional cooperation: Regional cooperation mechanisms, assessment of the CDM at the regional level, funding mechanisms, measurement of the effects of assistance, and cooperation in Northeast Asia

⬇⬇⬇

National policy: Domestic policy measures for climate change mitigation, domestic emissions trading, domestic consultation processes on the issue, estimations of GHG emissions, review of national communications to the UNFCCC, accurate methods of measurement for GHG inventories

1.4 Major findings

a. International regime to address climate change—the Kyoto Mechanisms

In December 1997, the governments agreed to adopt the Kyoto Protocol at COP-3. The Protocol's aim is to limit GHG emissions first in the industrialized countries (Annex I countries), reflecting the guiding principle of "common but differentiated responsibilities" mentioned in the UNFCCC. As an inseparable part of the emission targets, the Kyoto Protocol gives remarkable flexibility to comply with the quantified emission targets by using the market-based "Kyoto Mechanisms" (emissions trading, joint implementation [JI] and CDM). These Kyoto Mechanisms serve to integrate business and climate change mitigation. At COP-4 in Buenos Aires in 1998, the rules on how to operate such mechanisms were left to be decided at COP-6 (in The Hague in 2000).

Emissions trading and joint implementation are flexibility mechanisms for Annex I countries, which are bound by quantified targets under the Kyoto Protocol, to comply with their commitments by allowing acquisition of emission permits (emissions trading) or emission reduction credits through climate mitigation projects (JI) within Annex I countries.

In particular, emissions trading is a new and innovative instrument for many countries, except for the U.S., which has experienced many federal and local schemes to address air pollution; for example, SO_2 emission control. A variety of difficulties remain in designing a GHG emissions trading regime suited to diverse countries as a workable *international* mechanism.

The IGES Climate Change (CC) Project launched a comprehensive and precise study on the CDM (called the "Kyoto surprise" because of its unexpected proposal for everyone), at an early stage. In a paper titled "Issues and options in the design of the Clean Development Mechanism,"[1] the authors, Matsuo, Maruyama, Hamamoto, Enoki, and Nakada, discussed key points, such as modalities, eligibility, baselines, credit sharing, adaptation fund, ways to reduce transaction costs, matching of needs and seeds, and incentives for investors. This comprehensive paper does not go into policy proposals, but identifies some possible sets of solutions related to the importance of an information clearing house, possible eligibility criteria, investment additionality, credit sharing, adaptation fund-raising, and effective utilization of existing international institutions based on the spirit of the Kyoto Protocol, particularly, in assisting the sustainable development of the host country.

The CC Project invited Dr. Robert K. Dixon as a visiting researcher for half a year. In his position as the director of the U.S. Initiative on Joint Implementation (USIJI; AIJ Program of the U.S. Government) and the U.S. Countries Study Program, he accumulated much knowledge at IGES. He also edited a book, entitled "*The UN Framework Convention on Climate Change Activities Implemented Jointly (AIJ) Pilot: Experiences and Lessons Learned*",[2] with a number of experts in the field of AIJ and CDM worldwide. This book provides very useful experiences of the AIJ Pilot Phase under the UNFCCC, which serves as a prototype for the CDM. Dr. Dixon played a role as both an author of five chapters and as reviewer/editor of the entire book. Dr. Matsuo also wrote a chapter related to the market aspects of the CDM and Maithili Iyer (visiting researcher from Tata Energy Research Institute [TERI], India) acted as reviewer from the

IGES side. This book is recognized as a reference book of AIJ pilot projects, through the compilation of experiences and findings with the participation of 34 authors and 44 reviewers. It was presented during COP-5 at an event attended by many of the authors and reviewers.

b. Proposal for co-operative mechanisms in the Asian region

The IGES GHG Emission Model (IGEM) was developed by Dr. Tae Yong Jung (Research Fellow, CC Project). The original motivation for developing the IGES GEMA (GHG Emission Model Development) was the need for an analytical tool that can address issues relating to the CDM, primarily quantification issues. As has been mentioned, the typical form of CDM projects will be bilateral, project-based activities to mitigate GHG emissions. Hence, at the first stage of its development, IGEM will focus on country-specific structures that properly represent each economy. Since the CDM will be implemented on a project basis, the potential for GHG emissions reduction relies heavily on the choice of technology. Therefore, inevitably bottom-up models for analyzing technology-specific issues must be applied. At the same time, the CDM will affect both investing and hosting countries through international financial transactions and technology transfers, which have macroeconomic implications. Therefore, the objective of IGEM is to develop a macroeconomic energy model that can conduct analyses of the CDM, with proper linkages to existing bottom-up models. To meet this objective, it is crucial that the economy is properly replicated, which requires careful model specification of each sector, including energy—a task requiring local expertise.

Empirical application of IGEM was conducted in Japan, China, and Korea. For example, the energy demand for the residential sector in Japan has steadily increased, except for the second oil shock period of 1980 to 1982. The energy demand in this sector is projected to reach 76 million tons of oil-equivalent (TOE) by 2020. The annual average growth rate from 2000 is less than 2 percent. However, one distinct feature of the BAU (business as usual) trend in this sector is that the share of electricity demand keeps increasing. After 2010, the share of electricity constitutes more than half of the total energy demand in this sector. The corresponding CO_2 emissions projection for this sector has also steadily increased, except for the second oil shock period of 1980 to 1982—like the steady increase in energy demand. The CO_2 emissions in this sector are projected to reach 27 million tons of carbon (TC) in 2020, excluding the CO_2 emissions from electricity usage. The annual average growth rate after 2000 is less than 1 percent. It is noted that more than half of CO_2 emissions will come from natural gas in 2020. In IGEM, many policy scenarios, such as use of the CDM and other domestic policy measures, can be tested. This work is now underway and will be one of the main applications of IGEM in the second phase of research.

One visiting fellow from China's Energy Research Institute, Mr. Li, Yun, conducted research on the CDM in China In his paper, "The Costs of Implementing the Kyoto Protocol and Its Implications to China" published in the "*International Review for Environmental Strategies*", Vol. 1, No. 1 (Summer 2000). He identified the potential of the CDM and the priority fields in China. Firstly, the energy demand and carbon emissions of China in 2010 were forecasted by analyzing energy conservation potential and the relationship between energy conservation potential and the CDM's potential. Energy conservation potential comes from direct (technology advancement) and indirect (industrial structure change) energy efficiency improvements. Since the CDM needs real and measurable carbon emissions reduction, the potential of the CDM can only come from direct energy conservation potential. The approach taken separates direct energy conservation from the total energy conservation in terms of energy intensity improvement. The CDM potential of China in 2010 is estimated according to the rate of contribution of direct energy conservation to the total energy conservation. The potential of energy conservation and the CDM will be different under different reference cases.

Another CC Project study focuses on the cost of reducing carbon in China; namely a case study on the Hengshui thermal power co-generation project. In this study, the Hengshui project is taken as a case study to estimate the unit cost of reducing carbon emissions in China. For calculating carbon emissions reductions during the project's lifespan, a dynamic baseline method was used. Since there is no CDM project or widely accepted model for the CDM project, the cost for reducing carbon emissions is difficult to identify. The unit cost is very different under different total costs, such as operating cost, fixed-asset investment, and financial net present value. The cost depends on the model of the CDM project, especially the financial mechanism of the CDM project.

Another CC Project study measured global warming impacts on China, using MERGE 3.1 (a dynamic optimization model developed by A. S. Mann and R. G. Richels) to simulate the world economy and global warming in the next century. According to this study, if no countermeasures are adopted, by the end of the next century the atmospheric temperature will increase by 2.7 degrees centigrade above that in 1990, which will bring about damage totaling U.S.$4.2 trillion

worldwide, equivalent to 1.5 percent of the world GDP. However, because of its location and level of economic development, China will be subject to damage equivalent to 1.7 percent of GDP. China's importance in the world will increase during this century—the country's shares of GDP, primary energy consumption and carbon emissions will increase dramatically; and per capita energy consumption and per capita carbon emissions will exceed the world average before 2050 and at the beginning of the 2030s, respectively. If the Kyoto Protocol is implemented, per capita energy consumption and per capita carbon emissions from China will exceed those of the world average before 2040 and around 2020, respectively. But great potential exists for energy efficiency improvements in China. Considerable energy conservation can be achieved by improving the industrial structure. In addition, China could postpone the day when its per capita energy consumption and per capita carbon emissions exceed the world average.

c. Financial mechanisms

One research associate of the project, Ms. Aki Maruyama, conducted an analysis of financial mechanisms. Two papers were published in 1999, "Public-Privates Synergy in Financing Climate Change Mitigation in Asia,"[3] and "Promotion of Cooperative Measures to Mitigate Climate Change in Asia: Cooperation through the CDM."[4] The results of this analysis were presented at the IGES International Workshop on the CDM and at an international meeting of the Eco-Asia Long-term Perspective Project.

In order to reduce GHG emissions in developing countries in the Asian region, which are expected to grow rapidly, large amounts of financial assistance are needed from developed countries in the near future. So far, assistance for climate change mitigation has come mainly from public financing. Despite some efforts, little progress has been made in investments in so-called climate-friendly projects that generally entail higher risks and higher initial costs than conventional projects. Under these circumstances, the introduction of the CDM is expected to facilitate private sector investments in climate-friendlier projects in developing countries. In connection with this, research on related issues, including the design of the CDM, its potential and constraints from various viewpoints, and a way forward to the construction of more effective financial mechanisms are necessary. The research results have been presented at several regional and international workshops and seminars, and discussed actively with experts and policymakers in the region.

Funding sources for GHG mitigation projects in developing countries has always been one of the crucial issues in the international debate about tackling climate change. So far, several steps have been taken to assist developing countries in financing climate change mitigation, including grants provided by the GEF, and AIJ activities. The CDM is considered to have a significant potential. In order to construct wider and more efficient financial mechanism options for climate change mitigation projects in Asia, this project analyzes relevant issues from the financial point of view. First, it presents an overview of current climate change-related financial mechanisms and their problems, arguing for stronger private sector involvement. It further analyzes the potential and barriers of the CDM as a financial mechanism to facilitate private sector investments in relevant sectors. Finally, it considers the complementary roles of public funds and private investments via the CDM, and points out some issues for further consideration.

In order to facilitate more climate-friendly investments though the CDM, it would be effective to utilize public funds to complement private investment and reduce some of the risks and barriers. Normally, risk mitigation measures for conventional projects in project financing include contractual agreements, financial design of the project, and insurance and guarantees provided both by private and public financial institutions. We could distinguish those best covered by multilateral/regional banks by reinforcing existing risk coverage measures, those best addressed by the development of new financial products by the private financial institutions, or those to be covered by government guarantees or bilateral export credits agencies.

Beside risk management measures, public funds should also address the issues which the CDM (private investment) could not address. They may include the following areas:

- Technology transfers entailing high transaction costs
- Creation of an enabling environment for private sector investments (including maintenance of basic surrounding infrastructure, capacity building, potential project identification, and support for monitoring and verification, etc.)
- Ensuring the regional balance of the project implementation
- Facilitation of technological innovation

With a view to constructing wider and more effective options for climate change-related financial mechanisms, it would be necessary to take a holistic approach, making the best use of the market enhancing functions of various public funds to complement private investment via the CDM. In doing so, relevant parties should strive for the early formation of international consensus on the rules and

modalities of the CDM. At the same time, it is necessary to examine a host of factors, including efficient risk sharing mechanisms, private sector investment behavior, and areas where the private sector is difficult to address.

There are also some issues which will require careful examination in the future. They include the relationship between public financial supporting measures and Organization for Economic Cooperation and Development (OECD) trade or World Trade Organization (WTO) rules. In the long-term, climate concerns could be incorporated as one of the important factors in country-specific aid strategies. At the same time, it will become increasingly important that developing country governments should strive for the reduction of investment risks and the introduction of policy measures to promote climate-friendlier technology transfers and energy sector reforms.

d. Proposals for domestic policy measures

IGES generally focuses on the international aspects of environmental issues. However, it is important to pay attention to domestic issues in the developed countries from the perspective of implementation of mitigation options to meet international target- and incentive-setting for the development of the CDM and technology transfer. In this sense, the design of domestic policies and measures in Japan is an important research theme of the CC Project. In particular, the introduction of the Kyoto Mechanisms (especially emissions trading) indicates the importance of firm level emissions trading as a domestic regulatory framework.

It is difficult to collect appropriate and accurate information in Japan on how other developed countries address the issue of domestic emissions trading design, although it is an important input. The CC Project reported thorough information on this subject, ranging from background to implications. This was revised to Version 5 and provided useful information in the related discussions in Japan.[5] In particular, the approach taken in the United Kingdom is very informative for Japanese stakeholders. In the United Kingdom, the government decided to introduce a climate change levy on energy consumption in the business sector. In addition, a relief measure was introduced for energy intensive industries by applying so-called negotiated agreements with the government. As a counterproposal from the industry sector, domestic emissions trading emerged (including design of the scheme) in order to comply with the agreements. A similar example can be found in Norway, where the industry sector proposed and also designed domestic emissions trading (linked to international emissions trading) as a countermeasure of the existing carbon tax.

In the proposal, the emissions trading scheme is the major component of a portfolio which is divided into two phases, before and after the year 2008. The former is an extended version of the "Voluntary Action Plan" of the Keidanren (Japan Federation of Economic Organizations), which is a relatively easy transition from the current status (up to the year 2007), and the latter is a fairly radical proposal to create a new economy called the carbon economy (per capita allocation base after the year 2008). In addition, exclusive carbon tax for small-scale users will be levied to provide financial resources for subsidies to mitigate climate change (and as funds for corporate tax reduction). As for other measures, there will be no specific differentiation before and after the year 2008. There will just be a comprehensive package of small measures emphasizing the promotion of business-based efforts, like ESCO (Energy Service Company), and the establishment of institutions in order to realize ideas from the public and to share various good practices.

e. Comparative analysis of domestic best practices in G8 countries to address climate change

To realize the GHG emissions reduction targets adopted in the Kyoto Protocol, Annex I countries are promoting domestic policy measures. The policy measures differ from country to country, reflecting each country's situation, but at the same time, many ideas can be helpful if shared. In this spirit, the Environmental Futures Forum was proposed for environmental policymakers of G8 countries and participants from industrial sectors and NGOs to exchange experiences about domestic "best practices" in addressing climate change. The CC Project took on the task of collecting information about the domestic best practices of each G8 country, upon request from Japan's Environment Agency.

The CC Project had already begun research on other countries' domestic measures as input for Japanese policy development relating to climate change. At the request of the Environment Agency, IGES sent questionnaires to the concerned agencies in each country. The results were then compiled and the background of each domestic policy was analyzed. Ten to fifteen best practices were recommended from each country. The actual examples of these policies were unified in a form of spreadsheets for easier reference and summarized into a report "G8 Best Practice Guideline."[6] The project leader, Prof. Nishioka, reported the results of the comparative analysis at the G8 Environment Futures Forum, held in February 2000, with the participation of the

concerned agencies of each country, representatives of international organizations, and experts (eighty participants in total).

From the comparative analysis, it can be said that every country puts stress on the energy/industrial sectors, but measures in the transportation or agriculture and land-use sectors are emphasized more in some countries than in others. Other than these sectoral efforts, in every country there are initiatives by governments and local communities to promote comprehensive measures, such as improving laws, reforming taxes, and establishing a system to enhance the participation of the general population.

As a result of the discussions at the Futures Forum, and as a recommendation for enhancing efforts in G8 countries, the following point can be emphasized: most of the best practices are a blanket package of comprehensive measures. It is not just one of the measures, but a combination of the measures that brings great benefits. However, many difficulties hinder the quantification of cost effectiveness, and the impacts on the overall economy have not been adequately considered. Greater effectiveness can be expected by providing more information to stakeholders, such as consumers or actors at the regional level, or by more cooperative efforts between sectors.

The outcomes of the forum were reported at the G8 environment ministers' meeting held in April 2000 in Shiga Prefecture, Japan and reflected in each country's policy measures. The outcomes were also distributed to the major local governments in Japan, to be used as a reference for their own policymaking.

The G8 Environmental Futures Forum was held 14–15 February 2000 at the Shonan Village Center in Japan. The participants discussed domestic best practices in addressing climate change, based on the report on the analysis mentioned above. Discussions at the forum in five working groups and plenary sessions resulted in the following general conclusions and recommendations to the G8 countries, in addition to the conclusions and recommendations from each working group.

Best practices are often comprehensive packages of policies that function in an integrated way to mitigate climate change. They often entail multiple benefits rather than singular outcomes. Best practices are those that are suited to national circumstances and achieve results in the area of greenhouse gas emissions reductions. Best practices involve all stakeholders and at a variety of levels. Their effects are quantifiable whenever possible. They are cost-effective. They should reflect and aim to stimulate long-term changes in technology.

Barriers to the development and implementation of best practices include the difficulty of properly evaluating the benefits of practices; the lack of full reflection of environmental externalities in market prices; competing priorities of stakeholders and potential difficulties in justifying efforts to address climate change; lack of awareness; reluctance to take up new technologies and approaches; insufficiency of signals to consumers; lack of agreement among stakeholders in terms of issues and approaches; and a lack of inter-sectoral collaboration.

Above all, the Forum found the exchange of information and views to be valuable, and recommended that G8 countries continue information exchanges and evaluations regarding best practices addressing climate change, including both successes and failures. In addition, the following general recommendations were made:

- That G8 countries increase their efforts to utilize comprehensive and integrated policy approaches;
- That G8 countries develop and implement practices and measures which result in multiple benefits not merely limited to greenhouse gas emissions reductions, while reducing implementation costs;
- That G8 governments should work to involve all stakeholders early in the policy development process;
- That G8 countries promote cooperation among stakeholders and dialog between producers and consumers to create new and/or expanded markets;
- That G8 countries may influence consumer decision-making through such options as labeling, market signals, and public education of consumers and other intermediary parties;
- That G8 governments design practices and measures with the acceptability to stakeholders in mind in order to increase the degree of take-up of such measures by those stakeholders;
- That G8 governments design and implement regulatory, voluntary, and informational measures and economic incentives to promote desirable behavior;
- That G8 countries promote an increased emphasis on community-based approaches and local initiatives;
- That G8 governments at all levels set positive examples for society in areas such as green procurement;
- That G8 countries exchange information on and continue to develop indicators in order to facilitate the identification and evaluation of best practices;

- That G8 countries actively pursue the research, development, and demonstration (RD&D) of innovative technologies such as information technologies; and
- That G8 countries make efforts to exchange, disseminate, and share experiences with other countries, including developing countries, in cooperation, wherever practicable, with relevant international organizations.

f. Contributions to the IPCC

The IPCC was established with the objective of providing a policy-relevant and "credible" scientific basis for policymakers. It releases full assessment reports every five to six years as a credible compilation of the most up-to-date scientific knowledge, as well as several special and technical reports. The IPCC is a scientific community involving thousands of scientists as well as an intergovernmental panel. Three Working Group Reports and the Synthesis Report were released in 2001 as a part of the third assessment activities.

IGES researchers have contributed much to this important international exercise to accumulate knowledge.

Dr. Shuzo Nishioka, project leader of the CC Project, is actively participating on the TAR Working Group II (Impact and Adaptation) Report as a lead author of Chapter 2. He serves as an active organizer of the climate research society in Japan and as one of the most senior researchers in Japan participating in the IPCC process since 1998.

Dr. Naoki Matsuo, Senior Research Fellow, has supported Prof. Taniguchi, Vice-Chair of the IPCC at the Global Industrial and Social Progress Research Institute (GISPRI). Matsuo contributed to three chapters of the TAR Working Group III (Mitigation) Report, including cross-cutting issues, and the Synthesis Report process.

g. Improving national GHG inventories: forming an Asian expert network

National inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol (national GHG inventories) are quite important, both scientifically and politically, in considering climate change issues. First, they are vital for quantifying the release of GHGs into the atmosphere and for assessing the impacts of increasing GHGs in the changing patterns of climate change. Second, they are also critical in evaluating the cost-effectiveness and feasibility of mitigation strategies and emissions reduction technologies. Third, the UNFCCC calls for the Parties to the Convention to develop, periodically update and publish national GHG inventories. And fourth, national GHG inventories will facilitate determination of compliance with commitments under the Kyoto Protocol.

The quality of GHG inventories depends on the reliability of the relevant parameters, including the emission factors used in the calculation. It is preferable to use parameters that reflect national circumstances in order to enhance the quality of GHG inventory. However, many Asian countries seem to have difficulties in obtaining such local data and tend to rely on default data provided by the "*IPCC Guidelines for National Greenhouse Gas Inventories*." In some cases this is because of the lack of relevant data or research activities in the region, while in other cases this is because of relatively poor accessibility to such data in the region. A strong need for research activities to improve availability of and accessibility to appropriate data in the Asian region has been identified.

In this context, the Climate Change Research Project, with financial support from the National Institute for Environmental Studies (NIES), decided to undertake this activity to improve national GHG inventories and formation of the network of inventory experts in the Asian region. This activity was also meant to support and contribute to the Technical Support Unit (TSU) of the IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP), which has been hosted by IGES since September 1999. Major contributors are Mr. Kiyoto Tanabe (TSU, CC), Dr. Shuzo Nishioka (CC), Dr. Damasa B. Magcale-Macandog, and Ms. Li Yue (Visiting Researchers, CC).

Fully aware of the aforementioned, this research has been conducted with a view to improving the compilation of national GHG inventories for the Asian region. Its specific objectives are as follows.

- To present the current state of knowledge on GHG inventories in the Asian region
- To initiate the development of a database for GHG inventories in the Asian region
- To identify data gaps and problems in GHG inventories for the Asian region
- To evaluate the current methods used in the compilation of inventories in the Asian region and, where possible, improve the methods
- To form a network of GHG inventory experts in the Asian region with a view towards designing future collaborative work and information/data sharing
- To contribute to the work of the IPCC National

Greenhouse Gas Inventories Programme

Since the autumn of 1999, various efforts have been made as the first step towards achieving the objectives of this research. Those efforts include the following.

- Collecting existing national GHG inventories in the Asian region from various publications to make a preliminary database on parameters used in GHG inventory preparation in the region
- Participating in international meetings on this issue with a view to obtaining relevant data and information
- Exchanging views, relevant data and information with experts in Japan
- Organizing an international workshop on this issue

Major findings obtained and conclusions reached through these efforts are as follows.

A preliminary database on parameters used in GHG inventory preparation in the Asian region was made by reviewing the following data sources.

- Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories
- Reports of ALGAS (Asia Least-cost Greenhouse Gas Abatement Strategy) Project that was funded by GEF and implemented by ADB
- Asian countries' national communications (including Japan's) to the Conference of the Parties to UNFCCC submitted through the Convention Secretariat

An attempt to update this preliminary database on parameters used in GHG inventory preparation in the Asian region is being continued. We hope this database will serve as a useful source of data for inventory compilers in the Asian region in the future.

Bearing in mind the objectives of this research, we held a workshop on "GHG inventories for Asia-Pacific Region" on 9 and 10 March 2000 in Hayama, Japan, with the participation of about forty experts from China, India, Malaysia, Philippines, Thailand, Japan, and some international organizations. This workshop was funded by the Environment Agency of Japan, and hosted by IGES and NIES of Japan.

The workshop focused on three main sectors: agriculture, land use change and forestry (LUCF), and waste. This was because emission factors and other parameters in these sectors would vary widely, depending on the local or national conditions, and hence region-specific discussion was considered important. The workshop participants discussed data gaps and problems in GHG inventories in the region, evaluated and assessed the current methods for compilation of inventories, and proposed improvements on the compilation of GHG inventories.

The highlight of the workshop was the formation of a network of GHG inventory experts in the Asia-Pacific region that will focus on improving GHG inventories. The objectives of this network are to improve the database of activity data and emission factors in the region, to develop methodologies to improve estimates of GHG inventory, to assist Asia-Pacific countries in improving their GHG inventories, and to support the TSU of the IPCC-NGGIP.

It was suggested that the network be established in two stages. In the first stage, IGES may serve as the focus of a private network, comprised of individual experts from the region. In the second stage, the network should firmly establish its role in supporting the work of the TSU of the IPCC-NGGIP, and link with the UNFCCC National Focal Points of each country.

1.5 Conclusion

During the three years of the first phase of IGES research, in response to the progression of international policymaking, the CC Project has made many timely proposals that contributed to the policymaking process, both internationally and domestically. The Project also established a basis for long-term research by developing original methodologies, such as the Regional Energy or Environmental Model (IGEM). The network-building among international and domestic researchers or stakeholders was also a success. As a result, the CC Project is now recognized both internationally and domestically as a core research center of the climate change issue in Japan and the Asian region. As a result, many invitations to participate in major international research projects or to international conferences have been received. From these outcomes, it can be said that the Project has fully achieved the original research plan.

Towards the implementation of the Kyoto Protocol, which has been a pressing issue in the world, the Project has contributed to the discussions under the UNFCCC by making proposals at major international conferences on the design of key elements such as emissions trading, supplementarity, and the Clean Development Mechanism. At the conferences held in the Asian region, the Project has made proposals on the following issues: funding mechanisms for developing countries such as the CDM; technology transfer; the possibility and assessment of cooperation of the four countries in Northeast Asia; analysis on the effects of carbon taxes; and cost analysis of the CDM. The Project has developed a network of researchers

from twelve Asian countries for the purpose of improving GHG inventories. For this network the project has been requested to cooperate in global research programs such as the GCTE (Global Change and Terrestrial Ecosystems [part of the International Geosphere-Biosphere Programme]). In Japan, the Project has contributed to the domestic policymaking process though participation in governmental committees and councils, and has been recognized and is functioning as a base for the transmission of information by holding brainstorming forums, symposiums, and seminars. As for the IPCC, which contributes scientific information to the policymaking process, several project members are contributing by writing synthesis reports, working group reports, and special reports. These activities cover most of the research range and decision-making levels originally planned, and it can be said that solid foundations have been laid for research activity in the second phase of IGES research.

2. Self-evaluation of the Project

2.1 Originality

The CC Project is unique in Japan and the Asian region for making comprehensive policy proposals focused on the issue of climate change. The Project works closely with TERI and the Thai Environment Institute (TEI), both IGES signatory institutes. It continually takes into consideration the current state of UNFCCC processes, and our research maintains a high degree of flexibility to meet emerging needs. Research results are provided in a timely manner to the policymaking processes, both international and domestic. This is possible because the project carries out its research activities in close relation with the UNFCCC, the IPCC, and the Japanese government.

Research is focused on policy proposals and measures for international framework-making. Recognizing that the participation of developing countries is an important part of the process of attaining international agreement, our project focuses on the Asian region by analyzing cooperation systems such as the CDM, the effects of funding mechanisms to support the systems, and case studies focused on Northeast Asia. We also focus on Japan and make proposals for domestic emissions reduction policies. The Project conducts, as illustrated above, consistent research to provide input into policy measures, from international and regional to domestic levels. Thus, the project has developed a system that enables us to make consecutive proposals for policy measures.

The issue of climate change can be described as a showcase of the issues of sustainable development. It requires the efforts of many specialists of various fields and extensive information from various countries. The Project's research is carried out not only by IGES but also in cooperation with many international research institutes. It has accepted visiting researchers from the following institutes to conduct research from an international viewpoint: TERI, the Energy Resource Institute and Agricultural Laboratory in China, PIK, the University of the Philippines, and the United States Department of Energy. We also conduct cooperative research utilizing a network formed by organizing international workshops. This kind of research style can be regarded as one of the unique characteristics of our project.

2.2 Achievements

The CC Project was expected to carry out the following activities and, in general, has accomplished them in accordance with the original plan: (1) research; (2) increase influence in domestic and international policymaking, based on research results; and (3) become a center for information exchange for researchers, policymakers, and other stakeholders.

The work of individual researchers was extremely active during the first phase. Project members made thirty presentations of research results, although the number of the presentations at academic conferences was equally high, since the researchers were occupied with staying up-to-date with the rapid progress of negotiations on climate policies and measures. The number of project personnel was not sufficient to address many of the themes involved with the issue of climate change. As the negotiation process developed, it became increasingly important to have close contact with researchers and stakeholders overseas by attending international workshops, meetings, etc. One result was a lack of time to concentrate on academic research. As for domestic activities, the researchers were also constantly busy attending various committees and meetings, and responding to outside requests.

During the UNFCCC negotiation process, the issue of carbon sinks arose as a critical issue. However, a lack of manpower prevented us from fully addressing this issue. In addition, it was not possible to address issues of renewable energy, such as biomass, which was listed in the original research plan. As is described in this report, the CC Project has made significant efforts to have our research results reflected in the policymaking process. Overall, the Project has gained considerable momentum during the three years of the first phase of research.

As a result of our research and outreach activities, the

project is now recognized worldwide as part of the core of climate change policy research in Japan, and the project is becoming a center for information exchange and personal contact.

2.3 Management

At the beginning, the project started with six Japanese researchers (two with doctor's degrees, three with master's degrees, and one researcher transferred from an electrical company) and one project secretary. In succeeding years, short-term visiting researchers came from the U.S. Department of Energy, TERI, and Potsdam Research Institute for Climate Change (PIK). Researchers were dispatched from the Energy Resource Institute in China for a one-year period. In addition, we accepted visiting researchers (University of the Philippines, Agricultural Research Institute of China) for GHG inventory-related issues. A research fellow from the TSU whose focus is on inventory (meteorology) has an additional post in this project.

One research associate (master's degree in economics) was newly hired in the second year, but was soon transferred to another research institute. During the second year, a research fellow from Korea (Ph.D. in economics) joined the project. Furthermore, 2 visiting researchers and an intern (Nepal) joined this project.

The project management relating to research quality and personnel management was relatively smooth. However, we still have several areas needing improvement, as described below.

(1) Insufficient research guidance and obstacles in decision-making

Because the project leader works in this role on a part-time basis and is occupied with other tasks outside IGES, the research guidance and job allocation for young researchers was insufficient. The lack of decision-making in both important and daily matters slowed the overall progress of research activities.

(2) Gap between senior and junior researchers

Related to this, a gap existed between researchers who set targets independently and those who were not able to do so. As a result, the project was only able to retain the former type as project members, and was unable to nurture young researchers. It is clear that we need to reinforce the system of research guidance, in relation to the educational functions of IGES and the continuation of the project. However, currently this is difficult to achieve due to the large volume of requests for research on the climate change issue.

(3) Utilization of researchers from overseas institutes

The potential of visiting researchers from foreign research institutes was not always fully realized, due to the briefness of their time with the project, or the lack of preparatory discussions on research themes. As one exception, one of the Eco-Frontier Fellows conducted research activities extremely positively and actively. This issue is also related to the project leader's work and system for research guidance.

3. Summary of the evaluation

3.1 Evaluation by RAC members

The CC Project was evaluated in four specific categories by four IGES Research Advisory Committee (RAC) members, starting first with the project plan. In this category, all four reviewers gave high grades between A (excellent) and B (good). In terms of the appropriateness of the project targets, we were evaluated as being in good shape; however, one reviewer pointed out that the public at large should be more involved in the project processes. Regarding the appropriateness of the research plan and methods, we also received high performance grades. One reviewer pointed out that policy analysis, regional workshops, publications, and networking are appropriate for the project.

For the second category, project achievement, most of the reviewers gave high grades, most of which were A, on the performance of the CC Project. In terms of project achievement, originality, contribution to related community, influence over policy, etc., most reviewers reported that they were very impressed with what this project has achieved in such a short period of time. With very limited human resources, this project accomplished huge contributions to the international research community on climate change issues, by contributing to the IPCC, organizing a series of regional workshops, influencing international policy formation, and engaging a wide spectrum of stakeholders. However, one reviewer commented that evaluating the efficiency of a project such as this is difficult.

Some reviewers said that they especially appreciated that the CC Project has contributed significantly to the policymaking process—a necessary factor as a strategic research institute. However, one important comment was that it is necessary to engage the media more for widespread dissemination of information. In terms of disseminating research results, the CC Project was evaluated by most outside evaluators to have been quite successful in presenting its work on various occasions.

In terms of project management, the basic response from the reviewers was that they are not in a position to evaluate this performance category and that some feedback and more information are necessary. Nevertheless, some reviewers pointed out that the CC

Project needs a full-time project leader, which is already mentioned in our self-evaluation. Furthermore, the Project needs more research staff to fill the gaps between junior and senior researchers, and more guidance is needed for young researchers. Finally, the reviewers strongly encouraged more outsourcing or networking with international research communities.

The fourth category, the general evaluation of the CC Project's overall performance, was highly graded, with three A's and one B+ (better than "good"). All four reviewers recognized that the Project established its leadership role in a short time period in the regional activities as an information exchange center for climate-related issues. Regarding the effectiveness and efficiency in reaching the Project targets, the reviewers gave a similar range of grades as the overall performance evaluation, recommending a more active role in the implementation of action plans, both domestically and internationally. One specific request was that in case the U.S. withdrew from the Kyoto Protocol at COP-6 in The Hague (which indeed it did), it would be necessary to re-examine the actual situation and re-orient the project to achieve its targets.

In addition, we also received evaluations on the overall performance of the First Phase Strategic Research Plan. The appropriateness of the project themes dealt with by IGES in the first phase was viewed as fine, as with project methodology. However, in terms of evaluating management and administration of the project, there is room for improvement in general. Some reviewers made the point that linkages between projects are necessary. In conclusion, all four reviewers gave high grades for the accomplishments of the CC Project in its first phase, commenting that IGES had made remarkable progress.

3.2 Evaluation by outside experts

So far, the CC Project has received evaluation from four governments (Cambodia, Canada, Japan, and Mongolia) and three international organizations (OECD, United Nations Centre for Regional Development [UNCRD], and United Nations Institute for Training and Research [UNITAR]). All four governments gave the Project grades of A in terms of appropriateness of the project themes. Among three international organizations, two gave the CC Project an A grade and one gave a B grade, commenting that climate change is a real challenge for the future. Regarding the appropriateness of the Project's approach to the project theme, the Project received the same grades as for the previous item. In terms of contribution to the international community, the Project received four A's and three B's, along with requests for more contributions to the international community. At the same time, some of the reviewers expressed appreciation for the contributions of the CC Project to IPCC activities, the G8 Forum on Environment, and regional activities.

Five out of seven outside reviewers said that the CC Project is most interesting and relevant to their organizations, indicating the usefulness of the research results. Many of them pointed out that the results of the Project are useful contributions as background for policy formulations to address climate change. Finally, the overall evaluation of the IGES First Phase Research Programs was very positive, and reviewers held high expectations for more progress in the second phase.

4. Epilogue

Three years ago, when CC Project was launched, with only a small research team it was a big challenge to cover a topic such as climate change, which involves many aspects of global environmental issues. At that time, the world community had just agreed on the Kyoto Protocol and its international mechanisms (the Kyoto Mechanisms) at COP-3 of the UNFCCC. It was the start of a long journey and a tedious negotiation process to reach consensus on how to mitigate GHG emissions.

The accomplishments of the CC Project in its first phase were recognized and appreciated by the experts in this field. In particular, the Project received the evaluation that, in general, it had set appropriate targets, achieved most of its research targets, and had contributed to policymaking processes and global research communities on climate change issues. Such an assessment is encouraging at a time when we prepare for the continuation of research and an expansion of related activities in the future.

With COP-7 of the UNFCCC in Marrakech now behind us (November 2001), the world community has entered the stage of implementing the Kyoto Protocol and exploring new, environmentally sound patterns of sustainable development. As many reviewers pointed out, the Climate Policy Project, renamed from the CC Project, also faces another stage, focusing on research on national, regional, and global climate-related action plans and policies.

In closing, I express my pride in the researchers of the CC Project, and appreciation to everyone who has contributed.

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Urban Environmental Management Project

Hidefumi IMURA

Project Leader

1. Outline of the Project

1.1 Background

Half a century ago, most parts of East Asia consisted of traditional rural societies based on agriculture. After World War II, however, industrialization and urbanization dramatically advanced, along with the trend of market globalization, causing drastic changes in environmental situations. Cities are apparently the manifestation of these changes with contradicting aspects—the light and shadow of economic growth. Economic growth, on one hand, causes various environmental problems, but on the other hand, it enhances the capability of making investments and mobilizing resources that are necessary for overcoming such problems. In reality, however, changes occur so rapidly that problems arising from accompanying growth cannot be dealt with in a timely manner, thus generating a myriad of problems.

The current situation of economic growth in East Asia is diverse. Japan has established its position as a leading industrial country. Several countries such as Korea and Malaysia have made great strides in reaching the top of middle-developed countries. China and a few other countries are currently undergoing rapid economic growth. Socioeconomic as well as environmental conditions in each country are quite different. From a bird's-eye view, however, there is a similar pattern of evolutionary transformation, in accordance with stages of economic development and its accompanying environmental consequences. Many Asian countries are making a huge shift from an agriculture-based society to an industrialized society. Simultaneously, developed countries and regions that were fully industrialized by the end of the twentieth century are about to make a great transition, affected by changes in economic structure to one that is powered by a more service-oriented, information-driven, and aging society. Along with these changes, there seem to be structural changes in the pace of population influx to cities and the types of resulting environmental problems.

Based on the above considerations, this project focused on cities in East Asia. First, it tried to understand the current situation of urban environmental issues in the region. Then it made a comparative analysis of data collected from different cities. Finally, it attempted to present policy guidance relevant to urban environmental management in the region.

1.2 Goal and targets

a. Objective

The final objective of this project is to present innovative ideas and models that will guide urban environmental management policies in the midst of economic development in Asia in the new century (Figure1). For this objective, the Urban Environmental Management (UE) Project tried to observe experiences of environmental management in different counties and draw lessons clarifying successes and failures, based on comparative assessment and evaluation of past experience and the present situation of urbanization and environmental problems in various Asian cities.

Another objective of the Project was to make a critical review of the Japanese experience in urban environmental management. The technical, legal, and social measures adopted in Japanese cities for environmental management may provide useful information for other Asian cities that are undergoing rapid industrialization and suffering from industrial pollution. The Project tried to analyze the effectiveness and limitations of Japanese approaches and discuss the applicability and transferability of Japanese models to other cities in Asia.

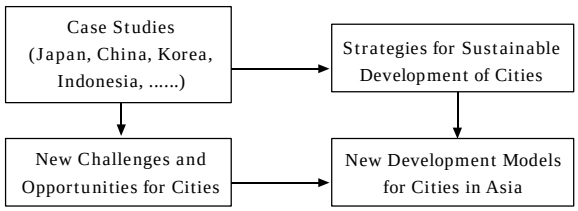

Figure 1. Project objectives.

b. Study items

Based on the above considerations, the project identified four study areas: (1) a comparative study on past experience, the current situation, and mechanisms of urbanization and environmental problems in Asian cities; (2) cities in industrial transformation: past

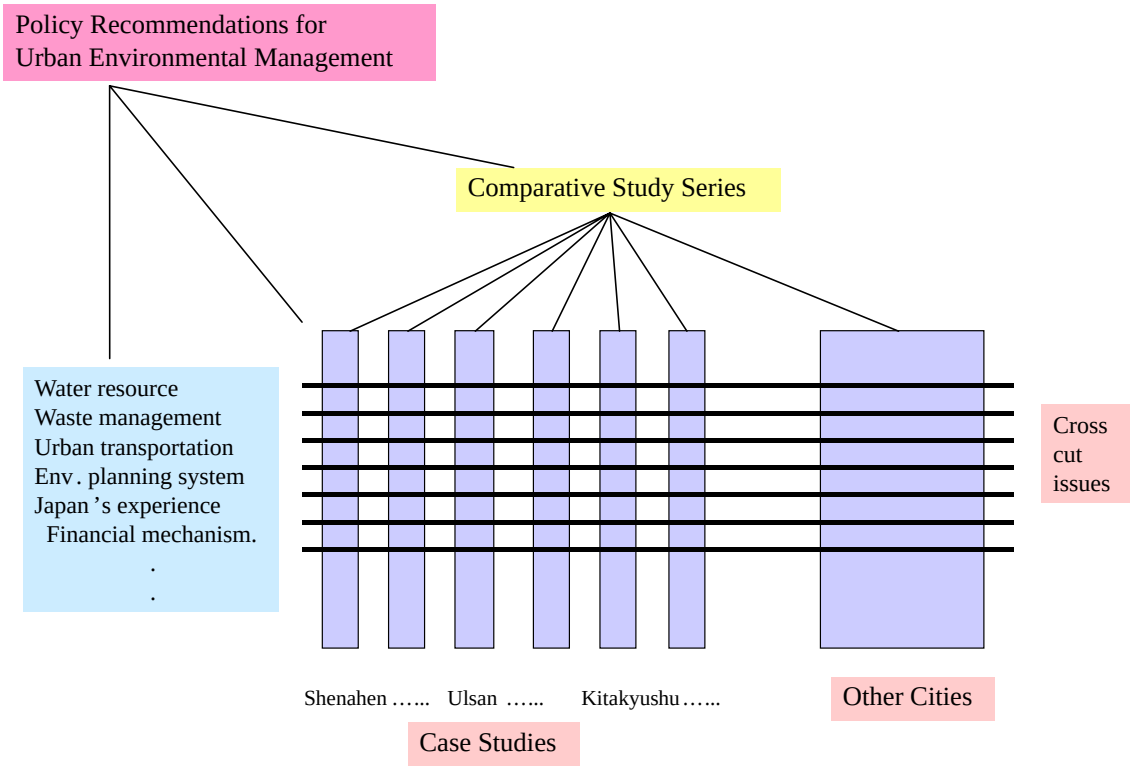

Figure 2. Project structure and research items.

experience and new models for urban development and environment in Japan; (3) strategies for improving urban infrastructure: mass transportation, sewerage, waste management, and water and electricity supply; and (4) strategies for improving governance in urban environmental management. In implementing the project, it proved necessary to identify more specific sub-topics to undertake actual work. The Project decided to synthesize research findings according to the following themes: (1) current situation, processes, and mechanisms of urban environmental transformation; (2) comparative studies of urban environmental management practices in selected cities; (3) the Japanese experience in environmental management and its implications for other Asian countries; (4) financing for urban environmental infrastructure; (5) urban transportation focusing on the four mega-cities of Tokyo, Seoul, Beijing, and Shanghai; (6) municipal solid waste management; and (7) a comparative study on urban environmental governance in East Asia.

1.3 Method and approach

This research consisted of two different types of studies. The first type was a vertical study on certain selected cities. The second was a horizontal analysis, or comparative study, on crosscutting issues and overall situations in cities in different countries (Figure 2).

An international study team was formed to implement the project with the participation of IGES in-house researchers and researchers from universities and other institutions in Japan, Korea, China, Indonesia, and other countries. For vertical studies, case studies were conducted for selected cities, and case study teams were organized with the participation of researchers who were familiar with local issues. In-house researchers of the UE Project were mainly responsible for horizontal studies, providing coordination of activities undertaken by case study teams. Ten cities were selected for case studies, and relevant information and data were collected on past experience and the present situation. All major findings from these exercises have been analyzed and compiled in a comprehensive report.

This project report presents research output on crosscutting research topics that were mainly handled by in-house researchers. As a common analytical framework, the Project adopted the DPSER model to analyze "driving force-pressure-state-effect-response" causal chains for the occurrence of problems and countermeasures against them.

1.4 Major findings

a. Current status, process, mechanism of urban environmental change in Asia

The objective of this study is to establish a basis for systematic understanding and analysis of the current environmental situation and mechanisms of dynamic transformation taking place in Asian cities. Two major approaches were adopted for this study. One is the historical analysis of the urban environmental changes in selected cities in the region. The other is comparative studies of different cities with respect to the current status and the dynamic process of change.

The basic assumption underlying these approaches is that development and structural changes in the economy may bring about different sets of environmental problems. The methodological goal is to find evidence showing that structural changes do exist in urban environmental evolution in relation to economic development, and to present a model for this generalized trend. A three-step approach was adopted in developing this model. First, complex urban environmental issues were divided into different groups by defining dimensions of causes and effects behind the problems. Second, the behavior of each group of issues is studied in relation to economic development. By doing so, more focus is placed on the driving forces, effects, and mechanisms of urban environmental issues, and they are analyzed separately, rather than as a unit. Third, a current status overview of the environment is presented to show the relationship between economic development and changing environmental issues.

Given the objective and approach, eight Asian cities—three from China, two from Korea, two from Japan, and one from Indonesia—were selected as case study cities to investigate, using the DPSER framework mentioned above. The "driving force-pressure-state-effect-response" framework, adopted in this study as a common framework for case studies, is a modified version of the pressure-state-response (PSR) framework developed by the OECD to establish its core set of environmental indicators, as well as to analyze environmental performance. Compared to the PSR framework, DPSER reflects a more detailed and complete link by adding two important factors—the driving forces (D) behind the pressures, and the environmental impacts caused by human activities and resulting altered environmental state (E). The major findings from theoretical modeling and comparative studies are as follows.

- Focusing on different driving forces and impacts, urban environmental problems can be divided into three groups: poverty-associated issues, production-associated issues, and consumption-related issues. Within each group, the problems show a similar pattern in relation to economic growth.
- Current major environmental problems confronting East Asian cities differ depending on the country. The major urban environmental problems identified in cities in China are industrial-pollution problems. In Korean cities, they are a combination of industrial-pollution issues and consumption-related problems, and in Japanese cities, they are typically consumption-related issues.
- An examination of urban environmental change processes in the case study cities determined that these types of environmental problems occur sequentially. The most common sequence of occurrence is poverty-associated issues, followed by industrial pollution, and then by consumption-related problems.
- A stage model of urban environmental evolution in East Asian cities was presented. The model consists of four stages: poverty stage → industrial pollution stage → consumption stage → eco-city stage. The future scenarios for the evolutionary path of cities are defined by a combination of internal drives and external pressures that differ from city to city.

Concerning the policy implications drawn from the case studies, several important observations are highlighted as follows.

- Industrial development triggered both urban growth and urban environmental problems in the case study cities. With economic development, however, the dominant feature of urban environmental problems has changed according to a similar process of transformation.
- Excessive pressures generated by rapid economic development and industrialization have changed the land-use pattern of cities and their peripheries, and increased the demand for renewable and nonrenewable natural resources—both at an unprecedented rate.
- Each city faces a unique mixture of various urban environmental issues—some improving and others worsening. There is a certain relationship between the types of dominant urban environmental issues and the economic development stage of the city.
- The environmental impact was large, including damage to human health. In some cities, however, the cost was not correctly recognized.
- Municipalities in these cities have taken various countermeasures, and many of them have turned out to be effective. The leading role of municipal

government in tackling environmental problems is essential, and close cooperation among citizens, the business sector, and government is inevitable.

- Paradigm shifts in the urban environment occurred, and in the case studies, it followed a sequence of poverty-related issues first, followed by the industrial pollution stage, mass consumption-related issues, and then efforts to build an environmentally friendly eco-city.
- The study results reveal some important implications for urban environmental management. Strong linkages between industrial structures and urban environmental problems can be seen in the case study cities, and the importance of integrating environmental policy into economic and industrial development policy has been demonstrated. Uniqueness in the political, economic, and social backgrounds of cities may have profound effects on urban environmental evolution. While municipal governments play a key role in tackling environmental challenges, citizens are also key actors, and their attitude towards the environment is subject to the special conditions in which they are placed. This presents the complicated and multi-dimensional nature of urban environmental problems, and thus, the importance of cross-sectoral responses.

b. Comparative studies of urban environmental management in Asia

The comparative studies on urban environmental policy measures show that Asian countries have made considerable achievements with regard to the urban environment. In Japan, where several industrial cities had once experienced rapid growth until the late 1970s at the expense of environmental degradation, it has been witnessed that industry-related air pollution was significantly reduced due to strict anti-pollution control and the vigorous participation of the private sector. In particular, the reduction of SO_x, a major industrial pollutant, has been remarkable in some Japanese cities based on heavy and chemical industry. For example, the decrease in the share of steel and chemical industries in Kitakyushu has been remarkable in recent years, while the share of general machinery industries has been increasing sharply. Given such industrial changes, the principal pollutant was soot and dust during the postwar period, sulfur dioxide (SO_2) in the 1960s and 1970s, and NO_2 since the 1980s, respectively. Along with strong anti-pollution regulation driven by municipal governments, the involvement of private sector and corporate initiative draw special attention in terms of how the efforts of private sector as polluter can be incorporated into the reduction of industrial pollution.

The case of urban environmental issues in Korea confirms that rapid economic growth and urbanization are the most dominant driving forces of environmental changes during the postwar period. In general, the Korean cities have experienced a gradual decrease of pollutants in both air and water pollution in recent years. More specifically, the discharge of SO_2 declined at a considerable rate, while nitrogen oxides (NO_x) became major air pollutants. In particular, the rapid increase of automobiles has contributed to the increases in NO_x levels. The majority of large cities in Korea have achieved great improvements in combating water pollution.

Yet, the Korean cities show a wide disparity of pollution according to their geographical and socioeconomic characteristics. For example, although Seoul is still being placed in the highest bracket with regard to the discharged amounts of all types of pollutants except SO_2, the city has achieved substantial improvement during recent years. In contrast, other Korean cities have quite a higher level of pollution in comparison with their city size. Another discrepancy between the Seoul Metropolitan Region (SMR) and other large Korean cities is observed in terms of water quality. Despite intense environmental pressure, the Han River, the main stream through the SMR, has maintained the lowest level of water pollution in terms of the level of BOD (Biochemical Oxygen Demand), while other major rivers located in other large cities have undergone little improvement since the 1980s.

The cases of several Chinese cities illustrate that there is a wide regional disparity of environmental issues in terms of the level of economic development and the locational characteristics of the selected regions. After an open-door policy in the late 1970s and a rapid increase of foreign direct investment (FDI), large cities (Shanghai and Beijing) and coastal cities (Shenzhen and Dalian) experienced several environmental problems closely related to urbanization and industrial growth, while inland and other periphery regions faced serious environmental challenges due to deteriorated quality of life and a deficit of financial resources available for environmental matters.

The case of Dalian, an industrial city in the coastal region, explicitly offers a showcase of urban environmental problems in Chinese coastal cities. For example, the Township and Village Enterprises (TVEs), a backbone of urban industrial growth in the city, have more negative impacts on the urban environment, because the majority of TVEs are concentrated in downtown districts, with a mixed land use of residential and commercial areas. Furthermore,

these small-scale industrial plants compound serious pollution problems due largely to their limitations, such as backward production technologies and a lack of interest in environmental matters. The response from Dalian's municipal government has been the relocation of the urban industrial sector into peripheral regions. As of the end of 1998, the government had relocated half of the designated 115 enterprises. However, "pushing out" these polluting enterprises into surrounding areas can be another policy failure. From a long-term perspective, such an industrial relocation policy is mostly likely to provide temporary measures unless new locations are equipped with environmental infrastructure with relevant capacity.

Several inland cities encounter environmental problems that are related closely to internal constraints, such as a lack of financial resources and a deficit of urban environmental infrastructure, rather than external pressures. For example, the city of Xian operates two municipal wastewater treatment facilities. The capacity of wastewater treatment available thus far enables the treatment of less than 50 percent of the total discharged amount of wastewater. Such a deficiency of wastewater treatment facilities in Xian has a negative impact on not only water supply, but also on the health of local residents. With limited supplies and excessive exploitation of water sources, a severe water shortage (domestic and industrial use) is expected within the next ten to twenty years. In addition, the backward technology and aging equipment for industrial wastewater treatment intensify water pollution in Xian.

As in other regions, Southeast Asian cities face very similar environmental challenges, such as industrial pollution and degradation of the urban environment. Yet these cities exhibit quite distinctive characteristics compared to Northeast Asian cities in terms of the nature of environmental problems. In other words, the urban environmental issues in Southeast Asian cities are to a great extent confined to poverty-related issues. For example, Tangerang, an Indonesian industrial city located in Jabotabek (Jakarta, Bogor, Tangermang, and Bekasi), was developed to accommodate the manufacturing sector as industrial growth expanded in Jakarta. Given the locational characteristics, Tangerang has experienced a wide range of environmental problems since the city was incorporated into Greater Jakarta (or Jabotabek) in the early 1970s. For example, the relocation of water-consuming industries from Jakarta to Tangerang generated negative externality to local environmental management. The relocation of such resource-intensive industries is largely responsible for the contamination of local rivers in the city. Furthermore, it poses serious dangers in terms of health and sanitation to local residents, who depend predominantly on groundwater for domestic use. In response to such environmental problems in Tangerang, the efforts of the city government are quite limited, because of the deficit of available resources and lack of concern on environmental issues at the local level. In short, urban environmental problems in Tangerang are largely the result of economic hardship and the inadequate provision of service delivery.

The main challenges of selected Asian cities facing environmental degradation are as follows. First, several Asian cities benefit to a lesser extent from environmental initiatives driven by central government. Much attention and resources are still given to urban and capital regions, while rural areas and peripheries are largely neglected. Second, local cities neighboring large metropolitan regions tend to be a target area for polluting industries. Facing public opposition and pressure against polluting industries and very limited available lands for the relocation of these industries in large cities, governments often solve these problems by either pushing these polluting industries outside city boundaries or relocating them to remote or less populated regions. Third, environmental problems are most severe where there is a lack of effective governance. Good governance is particularly critical for cities where municipal environmental management remains very poor. The lower degree of awareness of the environment in both government and the general public tends to further compound environmental damage in these cities. Along with the need for sound environmental governance, local governments should address the following three common institutional obstacles: the lack of effective coordination between interested parties (government, private sector, and NGOs); the absence of sufficient incentives to induce private sector participation; and the absence of consistent political commitment to implementation.

c. Japanese experience in environmental management and its implications for developing countries in Asia

The Japanese experience in environmental management draws intense interest from other developing countries in Asia in the following terms: (1) cooperative approaches to environmental governance; (2) measures taken at the source and integration of environment and development; (3) the completeness of a package of environmental policies and their strict enforcement; and (4) large amounts of environmental investment, and the adoption of sophisticated environmental technologies. On the other hand, Japan's successes and failures in environmental management also pose some questions for developing countries in Asia such as: (1) how to build cooperative approaches to environmental governance; (2) how to deal with the dilemma of

growth and environment; (3) how to structure national environmental policy; and (4) how to finance environmental measures.

First, the way to build cooperative approaches to environmental governance in Japan is regarded as "power-sharing" among various actors, including national and local governments, business, citizens, NGOs, media, and other civil societies. Such an arrangement contrasts with that of other Asian countries. For example, environmental administrative structure at the central level—power-sharing styles like in Japan or power-centralized styles like in Korea—each have their advantages and disadvantages. In both cases, however, it is necessary to make full use of managerial resources, while minimizing transaction and administrative costs. In this sense, consensus-building in policymaking is regarded as the most critical ingredient in forming collective and cooperative actions among all actors.

To facilitate such cooperative approaches, the following points are strongly recommended in environmental governance. The national government should properly devolve authority and power to local governments, along with raising local institutional capacities to match local functions, including human resources, policy know-how, technical expertise, and financial power. In addition, local government must promote so-called "bottom-up" driving forces, including local autonomy systems, social opinions against pollution, and opportunities for citizen participation in local affairs. In particular, the Japanese experience suggests that public participation in environmental management should be encouraged by: (1) opening the process of environmental policymaking; (2) providing political opportunity for the public to voice their environmental concerns; (3) information disclosure; (4) providing material incentives for public participation, like an environmental dispute resolution and compensation system; and (5) promoting environmental education. Furthermore, voluntary approaches and private sector involvement must be encouraged by providing effective regulations, as well as other institutional supports. Given these conditions, it is expected that environmental governance can shift from government-led actions to society-driven actions; namely, all actors together, rather than government itself solely launching environmental initiatives and management.

Concerning the dilemma of growth and environment, the Japanese practice of paying the cost for "grow first, then clean up" again provides a lesson for developing Asian countries to not commit the same errors in dealing with the dilemma of economic growth and environmental protection. Yet some Japanese experiences, such as industrial change, the increase of environmental investment, and the development of advanced technology, offer the significant lesson that these can not only reconcile the conflict between economic growth and environment, but also contribute to achieve sustained growth and environmental protection.

In fact, as Japan's economy shifted from a light-industry-and-agriculture dominated economy to heavy and chemical industrialization, and then again to a knowledge-based industry, such an industrial change equipped with improved production technology contributed much more greatly to pollution reductions. For example, between the mid-1970s and 1990s, upgrading industrial structures, energy conservation measures, and fuel shifts eliminated 70 to 88 percent of the total SO_2 generated by Japanese industrial production. In addition, huge sums of environmental investment in pollution control has also fostered growth of the environmental industry, which in turn has brought about great benefits for relevant industries and the national economy. Although the impact of huge environmental investments on the Japanese national economy was once neutral or negligible, it proves very effective in the long term.

Japan's experience in financing environmental pollution control, especially investment in urban environmental infrastructure, suggests that there must be greater effort to develop a joint-effort model of government and the private sector, i.e., to create public-and-private partnerships. Policy interventions, including preferential taxes, monetary policies, governmental subsidies, user charges, and even preferential instruments for entrance to the stock market, are critical incentives to increase the private sector's interest in constructing urban environmental infrastructure. On the other hand, Japan's financial aid model suggests that such special institutions as the Japan Environment Corporation and the Development Bank of Japan will be necessary to help industries attack the difficulty of funding for pollution control. These institutions can raise funds and provide financial aid to industries through the full use of public funds and government environmental budgets.

In sum, the lessons drawn from Japanese experiences present several implications for better environmental governance in other Asian countries. First, cooperative approaches take the shape of joint efforts and collective actions by all actors in environmental governance. Second, the relationship between the environment and economy should develop a mutual promotion model for environmental regulations, environmental investment, and environmental technology. Third, many Asian developing countries should show more concern towards policy development related to environmental legislation. Last, new alternatives of financing environmental infrastructure, such as public-and-private partnership

in environmental infrastructure construction and operation, should be explored in Asian developing countries, where financial resources are quite limited.

d. Financing for urban environmental infrastructure (UEI) in East Asia: Current situations, challenges, and strategies

In the urban areas of East Asian developing countries, gaps between supply and actual need have been dwindling at a relatively fast rate in infrastructure for economic development and urgent public services such as electric power, transportation, and communication. However, shortages of UEI facilities for public health, including sewerage works and garbage disposal, are still very great. The generation of household wastewater is soaring and now constitutes the main cause responsible for both surface and groundwater pollution. Concerning waste treatment, many East Asian cities are currently only collecting garbage from households and delivering it to dump sites without any treatment. Even in some cities where sanitary landfills for garbage are in place, the quality of the disposal process often does not meet relevant standards, leading to the pollution of areas surrounding landfill sites. Moreover, some municipality-established UEI facilities are frequently unable to operate due to a lack of funds. The features of UEI investment in East Asia can be summarized as follows: (1) small share of UEI investment in government environmental budgets; (2) contradictions of an increasing role by local governments and poor financial capacities; (3) the growing role of official development assistance (ODA) and multilateral finance agencies; and (4) increasing initiatives by the private sector.

On the other hand, UEI demand in East Asia is likely to rapidly soar in the future. A World Bank study estimates that the total investment demand for urban infrastructure in East Asia will be 1.5 trillion dollars from 1995 to 2004, accounting for 6 to 7 percent of its GDP (World Bank 1994).[1] Some East Asian countries have already exceeded the actual investment demands of urban infrastructure, including electric power, coal gas, transportation, and communication, since the second half of the 1990s. But governmental funding shortages for environmental public works such as sewage treatment and municipal solid waste management are still very large. Given such a situation and future prospect, a few financing strategies for UEI, including raising the priority given to UEI in governmental agendas and developing public-and-private partnership in promotion of UEI, should be explored. To exercise these strategies, governments should consider the following terms.

- Enhanced the role of government in UEI
- Promoting local initiatives
- Encouraging the public-private partnership
- Enhancing local financial capacities by financial and tax measures and economic instruments
- Collecting user charges including sewerage charges and garbage charges

So far, the private sector's involvement in UEI facilities in East Asia is increasingly apparent, especially in water supply and sewage treatment in two forms—the concession contract and the lease contract. For example, Manila and Jakarta, for example, have introduced a number of private finance initiative (PFI) projects by concession contracts in water supply and sewage treatment since the late 1990s. Through these projects, they have made use of a large amount of private funds and competition mechanisms to expand relevant facilities and the connections of water supply and sewerage, and improve managerial efficiency. In East Asia, BOT (build-operate-transfer) is becoming the most popular modality for the establishment of new sewerage pipe systems and sewage treatment plants.

Lease contracting is also very popular in some Asian countries. In the lease period, the private sector is responsible for the operation of entire facilities or some parts of facilities (management contract) or for the provision of relevant services (service contract)—such as meter reading, billing and collection, maintenance of pipe systems, electricity for sewage plants, and so forth.

In comparison with centralized treatment facilities, depending on the concession and lease contracts, decentralized facilities are normally small in scale but large in number, and have lower costs and looser technology requirements. Therefore, the private sector can easily play a more important role in decentralized treatment of sewage in residential establishments or in urban areas with fewer populations and geographic and financial difficulties in building pipe systems. In China, for example, decentralized sewage treatment facilities that do not require power and can be installed underground, invented by a private company, have currently been popularized in many municipalities in China.

On the other hand, the private sector can also participate in garbage disposal services in the form of lease and concession contracts. The garbage-related business in Malaysia, including garbage collection and disposal facility construction and operation, has been transferred to several private companies by concession contracts. Lease and concession contract projects for construction and operation of garbage disposal facilities, such as landfill and incineration, are also

present in the Philippines, Thailand, Hong Kong, Macao, and Singapore. But the requirements for technology in garbage incineration and landfill are stricter. Land acquisition for disposal sites is often difficult because of local residential opposition to possible secondary pollution, such as offensive odors, and even the risk of dioxin caused by incineration and soil and underground water pollution caused by landfill. These requirements and difficulties are often beyond the capacities of the private sector. Strong leadership by government is needed. Therefore, PFI in garbage disposal should be promoted carefully, based on national conditions, and step-by-step in East Asia, where relevant experience is limited at present.

Yet the private sector could be greatly encouraged in the areas of garbage collection, delivery, reuse, reduction, and recycling. In many East Asian cities garbage collection and delivery to disposal dumpsites are leased to the private sector, which has saved considerable managerial resources of government. Reuse and recycling of garbage has been a traditional business in which individuals, private companies, and public sectors in many East Asian countries are involved. Government should encourage their active participation and organize them well by formulating relative policies. Regarding advanced recycling processes, the participation of research institutions and universities, as well as private companies with good technological capacities, should be encouraged.

At present the critical limitations of PFI for UEI projects are financial risks that the private sector faces in project construction and facility operations. The essence of financial risks is in relation to the legal basis of the PFI project and whether the private sector can gain a profit from the project. Therefore, governmental policies and institutional arrangements of UEI should remove these uncertainties to encourage PFI by the following measures.

- Stipulation of related laws
- Preferential policies
- Provision of institutional supports

In addition, other UEI policy measures, such as the establishment of specialized development institutions responsible for operation and financing in UEI, can be considered for the promotion of PFI.

e. Comparative study on urban transportation and air pollution in four Asian mega-cities: The cases of Tokyo, Seoul, Beijing, and Shanghai

Of the various urban environmental issues, air pollution is a major challenge for many cities in East Asia. Public concerns over air quality increase with the rising standard of living as it exhibits direct risks to human health. A major source of air pollution in large cities is automobiles, although there are other diverse sources, such as factories. Air pollution caused by traffic is most notable and serious in mega-cities in which the number of vehicles is increasing much faster than the pace of population growth.

In four mega-cities in East Asia—Tokyo, Seoul, Beijing and Shanghai—despite government efforts against the degradation of air quality, the emission of air pollutants from mobile sources is one of the most urgent challenges. A comparison of the ambient concentration of major air pollutants in the cities confirms that the NO_x concentration, largely discharged from automobile exhaust gases, still remains at substantial levels, while other air pollutants have to some extent decreased over the past several decades. As compared to industrial air pollution that has recently improved through various measures focusing on stationary sources of air pollution, future prospects for the improvement of mobile air pollution in these cities are not optimistic. The underlying reason is attributed to the existing situations in the case study cities. Concerning urban transportation, it is expected that these mega-cities face a growing transportation demand from both freight and passengers that depends to a great extent on road transportation. Yet, considering the existing conditions in these Asian mega-cities, including a rapid increase in automobile numbers and a strong preference for private cars, the improvement of current road transportation systems is thus far quite limited. The following are concerned with the characteristics of urban transportation system in selected Asian mega-cities.

First, the relationship between urban scale and transportation in selected mega-cities differs somewhat between cities. Assuming that high population density in small areas is advantageous to mass transportation systems, Seoul and Tokyo have been in a better position due to well-developed mass transportation systems in highly dense urban areas. In contrast, Chinese cities are vast and have low population density, because they still include rather extensive rural areas within the ward area.

Second, the trend of motorization in terms of the numbers of passenger cars also reveals different pattern in these mega-cities. Tokyo experienced rapid expansion during the period between the mid-1960s and the early 1970s, but registered passenger cars did not show much growth after the collapse of the “bubble economy” in the 1990s. Rapid motorization in Seoul has occurred since the early 1980s. The passenger vehicle fleet of Seoul rose steadily to 1.8 million in 1997. Compared with Tokyo and Seoul, on the other hand, the total number of passenger vehicles

in Chinese cities is relatively small, where privately owned passenger vehicles have yet to become popular. As of 1997, the number of passenger cars in Beijing was only 16.6 percent of that in Tokyo, 28.0 percent of that in the Tokyo ward area, and 32.3 percent of that in Seoul. Similarly, Shanghai corresponds as 6.6, 11.0, and 12.8 percent, respectively.

Third, the statistics on vehicle use and public transit show that Tokyo has already reached a limit, in terms of registration and vehicle use. The total vehicle-kilometers traveled in Seoul increased rapidly, 3.2 times between just 1980 and 1990. In 1990, vehicle-kilometers per registered vehicle in Seoul were 30,400 km per year, or 2.5 times that of Tokyo. It can be said that people in Seoul use motor vehicles more frequently than in Tokyo, and hence depend more on motor vehicles.

Fourth, it is observed that there are apparent differences in the characteristics of transit mode shares among these four cities. In Tokyo, total passengers have increased steadily since 1974, peaking at nine billion in 1992. As of 1997, surface trains and subways accounted for more than 50 percent and 30 percent of total passengers, respectively. In Seoul, total passengers have fluctuated between 5 and 6 billion per year. As for road transit, while taxis have kept a certain share of more than 20 percent, buses have continuously been losing their share, dropping from 53 to 34 percent. Instead, subways have rapidly increased from 16 to 32 percent during the same period. The total public transit passengers in Beijing increased 2.6 times between 1978 and 1997. Specifically, the subway in Beijing gained shares every year and peaked at 13 percent in 1995, while the share in public transit of taxis had increased to 14 percent by 1997. The share of public transit in Shanghai shows a similar trend to that of Beijing, although substantial subway operations were started in 1994.

Fifth, the energy efficiency of individual vehicles shows that Tokyo consumed the largest amount of energy in the transportation sector, followed by Seoul. Compared to Tokyo and Seoul, the scale of energy consumption by the transportation sector in Beijing and Shanghai is still smaller despite serious air pollution caused by a rapid expansion of vehicle use. Concerning types of fuel, more than 97 percent of gasoline is used in motor vehicles in Tokyo and Seoul, while most vehicles use gasoline in China. The share of vehicle energy consumption in the total transportation sector is estimated at about 71 percent in Tokyo, 46 percent in Seoul, 39 percent in Beijing, and 27 percent in Shanghai, respectively. On the other hand, the intensity of energy use, namely total energy consumption and transportation energy consumption per square kilometer, is highest in Seoul. Specifically, per capita total energy consumption is almost the same in all four mega-cities. Yet, there is greater disparity among these mega-cities in terms of per capita transportation energy consumption. Tokyo and Seoul show higher per capita consumption, while Beijing and Shanghai have much lower per capita energy consumption for transportation.

Given these situations in the East Asian mega-cities, the future direction of urban transportation policy calls for more endeavors focusing on: (1) the development of well-networked public transportation; (2) private sector involvement in the construction and operation of public transportation; (3) the promotion of public transit fueled by clean energy; (4) the construction of circular and feeder roads; and (5) the increase of new mass transportation modes, including rail and subways.

f. Urban solid waste management: overall East Asian situation

Most East Asian cities witness that the amount of municipal solid waste generated from daily life increases in accordance with increasing GDP per capita. Many cities in the region have already experienced such changes as income levels have increased rapidly. Many of them, however, have not yet made sufficient investment in the development of advanced waste treatment and disposal facilities. As a result, there is quite a remarkable difference in the nature and content of problems between advanced and developing cities in East Asia. In fact, many East Asian cities have encountered changes in municipal solid waste volumes and treatment methods.

For example, a comparison of current waste composition in East Asian cities shows that about 70 percent or more of the waste mass is combustible. However, the composition of items differs depending on the economic level of cities. The ratio of paper and plastics is higher in industrialized countries, while organic garbage accounts for the majority of waste in developing cities. Therefore, suitable treatment methods are different for different compositions of waste. The calorific value of waste in industrialized cities is high, and is suitable for incineration. However, the caloric value of waste in developing cities is low, and is suitable for composting rather than incineration. On the other hand, waste in industrialized cities contains a great portion of voluminous materials such as food containers and wrapping materials. The shift from reclamation treatment to incineration is desirable in handling such bulky waste, but incineration may cause dioxin problems, and the adoption of sophisticated treatment technology increases costs.

As stated earlier, Asian cities follow a certain sequence for treatment methods in accordance with

their economic level, starting with "open dumping, then to landfill, sanitary landfill, and then to incineration." For example, Japan once relied on reclamation and dumping, particularly prior to the 1960s, but currently, high-temperature incineration has become the popular treatment method, along with recycling. Yet, the shift of disposal systems to reclamation and incineration poses a challenging task for municipal governments in Asia. In the case of incineration, municipal governments are forced to commit considerable investment to the construction of high-temperature incineration facilities. Parallel with such initial investment costs, the emission of hazardous materials, including dioxins and other pollutants, calls for advanced treatment technology with comprehensive impact analysis. In reclamation treatment, the main challenges are derived from the difficulty in securing landfill sites for reclamation and the contamination of groundwater and soil. In fact, many municipal governments have encountered more difficulties in finding sizable landfill sites within their jurisdictions, and have faced environmental disputes with local residents, who suffer serious health risks due to reclamation facilities. In addition, these prevailing treatment methods for solid waste in Asian developing countries cause not only major contamination of soil and groundwater, but also put people in serious health danger. In particular, waste disposal in the region is often undertaken by small-sized private treatment companies equipped with backward technology and facilities.

Facing the rapid increase of municipal solid waste, most Asian developing countries, on the other hand, still place lower priority on the improvement of environmental infrastructure than economic infrastructure. Considering that the increase in demand for public services for solid waste management will be accelerated with the increase in per capita income, larger expenditures will be necessary for collecting services and construction and operation of treatment and disposal facilities. In industrialized cities, policies for solid waste management are being incorporated into overall economic and industrial policies. On the contrary, municipal solid waste management may not be a priority policy concern for cities in which poverty is still a dominant issue. Even in such cities, however, citizens' lifestyles are shifting to more affluent ones. Moreover, improper treatment of municipal solid waste, such as open dumping, is causing sanitary and water pollution problems in many places.

In sum, the experience of waste management in East Asia countries suggests that the following points should be considered further to address sustainable urban environments. First, there must be an effort to induce eco-conscious lifestyles at the individual level. To this end, there should be more innovative measures to reduce waste, rather than depending on traditional approaches such as regulation and charges on waste generation. Second, there is an urgent need to explore alternative means for the improvement of environmental infrastructure, including waste treatment facilities. Thus far, most municipalities in Asia cannot afford appropriate environmental infrastructure due to limitations in financial resources and awareness. Yet, because the inadequate provision of environmental infrastructure is a threat to sustainable development in the long run, this issue should be prioritized on government agendas at both central and local levels. Third, there must be a comprehensive impact assessment of waste treatment prior to the construction of treatment facilities. The risks from waste treatment are far from being fully understood, and available information and monitoring techniques are very limited. Such uncertainty compounds challenges for many cities struggling to find a waste treatment site in their jurisdiction because of public opposition and the "not-in-my-back-yard" mentality. Hence it is very critical for these cities to ensure that local residents have access to relevant information and that treatment facilities are accurately assessed.

g. Comparative study on urban environmental governance in East Asia

In facing environmental problems, East Asian countries mainly had initial responses to domestic environmental problems using one of two approaches: bottom-up, as experienced in Japan; and top-down, as other countries once followed. Since the late 1980s, however, citizens, NGOs, media, and civil society have increased their presence in the environmental governance of East Asian developing countries, and consequently a mix of a top-down and bottom-up approach has emerged and gradually improved environmental performance.

So far, decentralization and deregulation is becoming the most dominant feature of environmental governance in East Asia. Yet, these changes have not been as effective as policymakers anticipated. The reason is that governmental intervention is sometimes essential for the resolution of environmental problems caused by market and policy failures. In particular, improper decentralization may worsen environmental governance in cases where local governments suffer insufficient capacities with lower priority on environmental considerations. Therefore, decentralization of environmental governance should be deliberately pursued, keeping pace with the rise of both local institutional capacities and interest in environmental conservation and with the advancement of political and economic reforms. In addition, soft guidelines and voluntary actions can be effective only where there is awareness and social values present that

support environmental actions.

Second, East Asian countries share similar frameworks with respect to environmental policy structure at the national level; namely, (1) basic policy; (2) specific policy for coping with diverse pollution and ecological degradation; (3) environmental financing; (4) research and development of environmental technology; (5) integration of environment and economy; (6) social environmental policy such as environmental dispute resolution; and (7) global environmental issues. Although these frameworks are largely dominated by command-and-control regulations, some unique characteristics still exist among the five countries. In comparison with Japan and Korea, China and other East Asian countries are suffering from a shortage in such capacities as financing, environmental technology, environmental dispute resolution, and integration of environment and economy. In particular, cities in Thailand, the Philippines, and even South Korea have fewer of their own instruments of urban environmental management compared to other cities in Japan.

Third, the practices of local initiatives show that there are differences in terms of government's role. Local governments in Japan and China have played a leading role in local environmental governance, whereas the role of local governments in other Asian countries, including Korea, Thailand, and the Philippines, is very weak. Local governments in these countries were not engaged in any major activities in environmental governance due to fiscal constraints and poor local institutional capacities.

In order to improve environmental governance, it is necessary that Asian countries pay special attention to the following terms: the role of government at national and local level, consensus building, self-governance of business, and full participation of the public. Most East Asian countries, except for Japan, responded to environmental problems initially with the top-down approach, which originated from the initiatives and efforts of central government and the pressure of international environmental concerns. The top-down approach thereby took the shape of environmental governance through governmentally-led action rather than being socially driven. As a result, environmental policies often cannot achieve targeted results and non-compliance becomes problematic. To change the pattern, the critical solution is to set formal rules encouraging full involvement of citizens and NGOs, active roles for local government, and self-governance by business. Experience in East Asia suggests that the provision of institutionalized opportunities for citizens to voice opinions, regulations to protect citizen's environmental rights such as environmental dispute resolution and compensation, and proper information disclosure are good instruments to facilitate public participation, in addition to regular environmental education.

In East Asia, the leading role of city governments depends on three factors: driving forces, governance power, and institutional capacity. In practice, grassroots forces and pressure from upper government are both workable to facilitate the leading role of city government, but grassroots forces should be encouraged much more in consideration of the higher implementation costs of upper governmental regulations. Decentralization proves effective for enhancing local power and institutional capacity. Nevertheless, the decentralization of power and missions in environmental governance should keep pace with local capacity building, the raising of local interests in environmental conservation, and the pace of political and economic reforms. Local institutional capacity, including administrative organizations, human resources, policy know-how, technical expertise, monitoring equipment, and financial capability (in particular), should match the powers and missions delegated by the central government.

1.5 Conclusion

In the first phase of the study, the UE Project tried to present an overall picture of major issues of environmental management in diverse cities. The Project carried out studies on the four themes identified at its start, and the major findings from these studies were presented above. The major findings of this project provide several policy implications for sustainable urban environmental management in Asia.

First, it can be said that many urban environmental problems in the region occur as a result of insufficient urban infrastructure for which a large amount of funding is required for improvement. However, the public sector in many countries in the region does not have the financial capabilities to ensure a sufficient level of urban infrastructure development. In addition to reliance upon aid from foreign governments and multilateral aid agencies, public and private partnerships should be encouraged in order to invite more private investment in urban environmental infrastructure by establishing proper economic and social conditions to ensure such investment. One example is the PFI (Private Finance Initiative) scheme introduced in the United Kingdom. Japan has also decided to use a similar approach due to financial difficulties faced by the state government. In other Asian countries, the BOT (Build-Operate-Transfer) scheme, based on foreign capital, has been widely adopted, and private involvement in public infrastructure has been experimented with in several cities. Such private-public partnerships are noteworthy

as new approaches towards developing infrastructure in Asian cities that are in urgent need to improve infrastructure, despite financial shortages.

Second, eco-partnership should be encouraged, inviting broader participation from public and private sectors, government and non-governmental organizations, businesses and citizens. Voluntary actions by different actors in society will replace reluctant actions forced by laws, and they will form the basis of more effective environmental management. Equally important is partnership between cities, regions, and different levels of government. Local initiatives for international environmental cooperation, such as bilateral and multilateral inter-city cooperation projects, should be encouraged for transferring the knowledge and know-how accumulated in one city to another.

Third, enhancing urban environmental governance is of crucial importance for cleaning up the environment and achieving sustainability goals. Environmental considerations should be integrated into economic and social development targets as a requisite, and their implementation should be supported by strong environmental management systems, proper institutional and organizational setups such as laws, regulations, standards, and official environmental departments in central and local governments—together with effective implementation tools such as monitoring and inspection, as well as economic and other incentive structures, financial support mechanisms, and suitable technologies. Environmental management systems can be improved by introducing new management concepts and policy instruments, while it is equally important to make full use of existing capacity. Stronger environmental governance will bring overall improvements to the urban environment—enabling a win-win environmental policy.

Fourth, many Asian cities have made great efforts to improve road networks in order to reduce urban traffic congestion, but this has often resulted in a vicious cycle, with increased improvements leading to increased road traffic. In this regard, mass transportation systems such as railways and subways should be encouraged. In particular, this policy direction for urban transportation is quite relevant for Asian mega-cities, where densely built-up areas are common. It is also necessary to disperse the urban functions presently concentrated in a few city centers, and to implement effective land use controls in the long term.

In sum, although the history of modern cities is rather short in Asia, the speed of change is outstanding. This rapid change presents both challenges and opportunities for Asian cities to find new development patterns different from American and European cities. The ultimate goal of the UE Project is to investigate how to re-orient the traditional course of urban development towards sustainable paths, and what technological, institutional, and social transformations would be required to achieve this goal. This is not an easy task, and is an endless effort, as cities evolve with the continuous transformation of the national economy, technological developments, changes in political regimes, etc. Cities in Asia, in particular, are going through a transition process. The cities that have had a late start are facing a multiplicity of difficulties and must overcome various hurdles all at once. Yet, if they can carry out proactive policies based on the experience of precedents of already developed countries, they will be able to implement more effective urban environmental management.

2. Self-evaluation of the Project

2.1 Originality

With respect to geographical scope, methodology, and topics, the UE Project is unique in several respects. First, the Project can be considered a new attempt to examine major urban environmental issues of Asian cities in comprehensive ways. Although there are a number of pieces of fragmented information on Asian cities, they have not been systematically collected and analyzed. Second, it developed and adopted a common analytical framework, in addition to collecting actual data from case studies of selected cities. The entire study consisted of horizontal and vertical studies. Horizontal or comparative studies were made to identify commonalties and specialties of cities under different conditions, using the data and information collected by vertical case studies. Third, it identified topics among diverse urban environmental issues that were most relevant to the implementation of actual urban environmental policies. It focused on strategic issues, including the method of financing for improving urban environmental infrastructures such as municipal sewage and solid waste treatment facilities, urban transport management in mega-cities, and the management of increasing volumes of municipal solid wastes. Moreover, it developed a theoretical basis for analyzing environmental transformation of cities in response to economic, social, and technological changes. A conceptual model was developed to describe the dynamics of causes and responses, based on the driving force-pressure-state-effect-response (DPSER) framework.

2.2 Achievements

The experiences of many Asian cities have demonstrated that urban environmental problems are

caused not only by economic factors, but also by social, institutional, and political factors. These factors are so frequently interwoven and interdependent that such a view of the urban environment legitimized the need for a new approach with broader and more comprehensive perspectives. In this regard, the UE Project's approach in developing a new multidimensional assessment model endeavors to provide broader and more comprehensive perspectives in explaining urban environmental management in Asia.

All the case studies in the Project's first phase have several characteristics, and differ from existing research for the following reasons. First, existing research on the urban environment reveals several limitations in terms of scope and method. In general, the existing studies depend largely on information and data at the national level, not the city level, although they seek to identify more concrete ideas on specific cities. The underlying reason is attributed to the availability of data at the city level. Instead, most existing environmental studies have placed research efforts on either depicting the overall picture of current environmental issues in aggregate terms or providing a few specific case studies in comparative terms. In this regard, the UE case studies are quite unique and distinct, because they compare a number of cities with in-depth analyses on individual cities.

Another advancement of the comparative studies is that the case studies can provide not only a plausible explanation on current environmental issues, but also causes and consequences of environmental problems. Indeed, existing studies tend to focus on immediate impacts of various pollution sources on the environment as a whole, while little attention is paid to causes and consequences in urban environmental issues. These limitations often disclose serious shortcomings in terms of the relevance of the research. From these points, it can be said that UE comparative studies make substantial advancements in comparison with other existing environmental research.

2.3 Management

It was a good opportunity for the Project to develop an international network of researchers. It was not an easy task to coordinate work undertaken by many researchers in different institutions. Nonetheless, coordination was done fairly well thanks to the cooperation of the members. However, analysis and synthesis of a number of research reports and the data collected was more difficult. An efficient system of data management and project coordination must be developed in the next phase.

3. Summary of the evaluation

3.1 Evaluation by RAC members

Overall, evaluators from the Research Advisory Committee (RAC)—Dr. Eda Muller of the Federation of German Consumer Organizations, Dr. Leena Srivastava of the Tata Energy Research Institute, Dr. Guang Xia of the Sino-Japan Friendship Center for Environmental Protection, and Ms. Norhayati Mustapha of the Institute of Strategic and International Studies, Malaysia—gave fairly good grades to the outcome of the first phase of the Urban Environmental Management Project. In particular, the research plan was highly rated by several evaluators. The Project's target and plan were found to be very appropriate and comprehensive, and the methods employed in the project met all the requirements of research in quantitative and qualitative terms.

The project achievements were also highly valued in terms of the set of comparative case studies and interdisciplinary approaches. Yet, most evaluators asked for more innovative ideas on the originality and practicability of research results. More specifically, they expressed strong interest in how the given results can be effectively reflected in the policymaking process of urban environmental management in Asia. Furthermore, they suggest that IGES's UE Project should prioritize not only academic contributions in terms of urban environmental studies, but also enhance the applicability of the outcomes for environmental administration at the city level. In this regard, a few evaluators recommended several options, including effective delivery of the project findings and recommendations to policymakers in specific meetings (ECO ASIA, ESCAP), and translation of outcomes to other local languages (Chinese, Korean, etc.).

The overall the evaluation of project management was quite positive. Evaluators thought the budget scheme was appropriate, with efficient distribution of personnel and financial resources. However, it was suggested that a set of local case studies would require more financing for in-depth analysis and comprehensive examination of the cases. Another point raised by the evaluators was the matter of balancing in-house and outside commissioned work. They recommended that in future stages the Project exercise closer examination of the specialties and needs of personnel prior to launching projects.

Most evaluators assessed the first phase UE studies to have been well done. There were, however, several points to be considered for future studies. First, there must be more attention given to developing an integrated approach and the assessment of urban environmental evolution in Asia. Second, the UE

Project needs to expand its research scope to other socioeconomic and political terms (e.g., the role of international trade, multinational corporations, political and social systems, gaps between rich and poor countries, and equity issues, etc.). Lastly, there should be intense efforts made to highlight the role of local initiatives in improving urban environmental management in Asia. In this sense, "The Kitakyushu Initiative for Clean Development" should be highly prioritized in the second phase of the UE Project.

3.2 Evaluation by outside experts

Outside experts from various backgrounds, including policymakers from national governments, evaluated the UE Project with the following comments. As in the evaluation from the RAC, the external evaluators were largely satisfied with the outcomes of the first phase of the UE Project. The themes and research plan were highly rated by most evaluators. They indicated that the theme covered by the UE studies is relevant and timely, because it is appropriate given current international interest in sustainable urban development. Concerning methodology and approach, the project was very practical, because the vertical and horizontal analyses of the selected Asian cities can illustrate important lessons and successful practices in terms of urban environmental management.

Regarding the influence over the policymaking process, the majority of external evaluators recognized the implicit impact of given project outcomes, but strongly recommended the development of a greater number of strategic policy options in addressing urban environmental problems. Several evaluators emphasized the importance of the contributions of the project outcomes for the international community. In this regard, more tangible contributions to the formulation of the Kitakyushu Initiative are expected in the next phase of the UE Project. In addition, several evaluators from multilateral organizations (UNU, UNCRD, UNESCAP) expressed strong interest in further collaborative work with the UE Project. Such a research arrangement of international organizations is expected to provide mutual benefits to all participants in terms of complementarity and specialization.

In sum, the results from the UE Project's first phase are considered quite impressive, but there must more intense efforts in the next phase of study. More specifically, the priority of second phase studies should be set on policy analysis and the formulation of strategic proposals, rather than purely academic research. The value of such proposals will be in the extent to which the proposed urban environmental strategies can be effectively implemented. If made from this perspective, strategic proposals from the Project would have a better chance to actually influence the region's urban environmental strategies, as well as to raise concern and awareness among policymakers and the public about urban environmental problems.

4. Epilogue

As stated earlier, the first phase of the UE Project aimed principally to provide a comprehensive examination of urban environmental management in Asia. In order to realize this goal, we sought to use unique methods in three ways. First, the UE Project took account of the major urban environmental problems in terms of their socioeconomic, institutional, and political dimensions. The case studies of urban environmental governance and urban environmental infrastructure are the results of these efforts. Second, we analyzed current urban environmental problems of Asian cities in a consistent manner by applying a common analytical framework (DPSER model and Stage model) to all selected Asian cities. Third, we developed strategic options for enhancing the implementation of actual urban environmental management. The case studies on urban infrastructure, such as municipal sewage and solid waste treatment facilities and urban transportation systems, reflected these priorities.

Given the research framework, we attempted to overcome the limitations of existing research on the urban environment in terms of scope and method. In fact, most existing studies tend to focus on the immediate impacts of various pollution sources on the environment as a whole, while little attention is paid to causes and consequences. This limitation often leads to serious shortcomings in terms of the relevance of the research. In this regard, the UE Project did fairly well, thanks to the cooperation between our in-house researchers and local collaborators from Japan, China, Korea, and Indonesia. To the greatest extent possible, IGES in-house researchers visited several case sites in Asia to collect local data and information. Moreover, local collaborators from selected Asian cities supplemented the work of our in-house researchers by providing very useful and valuable research. The UE Project also organized project-related workshops and other activities. These intensive endeavors enabled us to conduct in-depth analyses on current practices of urban environmental management in Asian cities.

As shown in evaluations from the Research Advisory Committee and other external evaluators, however, several tasks should be done in order to provide better outcomes in future studies. In launching the second phase of the UE Project, we will do our best to incorporate all these valuable suggestions: the development of a more integrated approach to urban

environmental assessment, greater focus on emerging crosscutting issues related to the urban environment, more attention to local initiatives of urban environmental management, and higher priority on making strategic proposals for multiple urban environmental stakeholders. We will also make efforts to enhance the international network of researchers and other institutes.

Finally, I would like to express sincere thanks to all participants of the first phase of the UE Project for their enthusiastic participation. Special thanks go to everyone at IGES who generously supported the Urban Environmental Project, including Professor Morishima and all IGES Secretariat staff.

[1] World Bank. 1994. *Infrastructure Development in East Asia and Pacific: Towards a New Public Private Partnership*. Washington, D.C.: World Bank.

Attachment 1

Key Findings of the First Phase of the Urban Environmental Management Project—Policy Implications for Asian Cities

1. Policy implications of Japanese experience

The experiences of urban environmental management drawn from what Japanese cities have implemented over the past several decades provide useful information for other Asian cities, in terms of socioeconomic and institutional aspects. The followings are some lessons that might be useful for sustainable urban environment in other Asian cities.

- Cooperative approaches take the shape of joint efforts and collective actions by all actors in environmental governance.
- The relationship between the environment and economy should develop a mutual promotion model for environmental regulations, environmental investment, and environmental technology.
- Many Asian developing countries should show more concern towards policy development related to environmental legislation.
- New alternatives of financing environmental infrastructure, such as public-and-private partnership in environmental infrastructure construction and operation, should be explored.

2. Financing for urban environmental infrastructure (UEI)

As in other regions, most Asian cities face severe deficits of urban environmental infrastructure due to poor institutional arrangements and the lack of financial resources. These cities should be encouraged to pay special attention on the following points.

- Enhance the role of government in UEI.
- Promote local initiatives.
- Encourage public-private partnerships.
- Enhance local financial capacities by financial and tax measures and economic instruments.
- Collect user charges including sewerage charges and garbage charges.
- Encourage PFI (Private Finance Initiative) for UEI with the following measures: (1) stipulation of related laws, (2) preferential policies, (3) provision of institutional support, and (4) establishment of specialized development institutions responsible for operation and financing in UEI.

3. Urban transportation and air pollution in Asian mega-cities

Facing the growing level of air pollution due to rapid increases of the numbers of automobiles in East Asian mega-cities, the future directions of urban transportation policy call for more effort focusing on the following measures.

- Develop well-networked public transportation.
- Promote private sector involvement in the construction and operation of public transportation.
- Promote public transit fueled by clean energy.
- Construct circular and feeder roads.
- Increase new mass transportation modes, including rail and subways.

4. Urban solid waste management

Given the experience of waste management in East Asia countries, it is essential to consider the following points in terms of urban waste management.

- There must be an effort to induce eco-conscious lifestyles at the individual level (e.g., more innovative measures to reduce waste, rather than depending on traditional approaches such as regulation and charges on waste generation).
- There is an urgent need to explore alternative means for the improvement of environmental infrastructure, including waste treatment facilities. This issue should be prioritized on government agendas at both central and local levels.
- There is a need to ensure that local residents have access to relevant information and that treatment facilities are accurately assessed.

5. Urban environmental governance

In order to improve environmental governance in Asia where local governments suffer insufficient capacities and have lower priority on environmental considerations, it is necessary that Asian countries should make intense efforts in the following areas.

- Improve environmental governance with the following considerations: (1) clearly specified role of government at national and local level, (2)

consensus building, (3) initiative of municipal authorities, (4) self-governance of business, and (5) full participation of the public.

- Support local grassroots initiatives.
- Promote decentralization with local institutional capacity building, including administrative organizations, human resources, policy know-how, technical expertise, monitoring equipment, and financial capability.

6. Summary

In the first phase of the study, the IGES-UE Project examined the major issues of environmental management in different Asian cities. Given empirical evidence, we suggest that the following points must be highly prioritized for sustainable urban environmental management in Asia.

- Encourage public and private partnerships such as PFI and BOT (Build-Operate-Transfer) to invite more private investment in urban environmental infrastructure by establishing proper economic and social conditions to ensure such investment.
- Promote voluntary actions through partnership, inviting broader participation from public and private sectors, government and non-governmental organizations, businesses and citizens.
- Promote partnership between cities, regions, and different levels of government - Promote local initiatives for international environmental cooperation, such as bilateral and multilateral inter-city cooperation projects, in order to transfer the knowledge and know-how accumulated in one city to another.
- Enhance urban environmental governance. Environmental considerations should be integrated into economic and social development targets as a requisite. Their implementation should be supported by strong environmental management systems, proper institutional and organizational set-ups such as laws, regulations, standards, and official environmental departments in central and local governments. It should also be supported by effective implementation tools, such as monitoring and inspection measures, economic and other incentive structures, and financial support mechanisms, as well as suitable technologies.
- Encourage mass transportation systems such as railways and subways.
- Disperse the urban functions presently concentrated in a few city centers, and implement effective land use controls in the long term.

Attachment 2

Main Features of Case Study Cities

Name of City	Country/ Location/ Population/ Area	Major Features
Shenzhen City	Southern China Guangdong Province 3.85 million 2020.5 km^2	Located next to Hongkong in Guangdong province, it belongs to the Zhujiang Delta economic zone. One of the first 4 special economic zones designated by the Chinese government according to its reform and open policy. Until 1978, Shenzhen was a small village without any industry. Since it was established as a city in 1979, Shenzhen has accomplished rapid growth, and at present, the highest proportion of industry is tertiary. In 1996, the GDP reached 95 billion yuan, which is more than 480 times that of the 1978 figure.
Jiangyin City	Eastern China Jiangsu Province 1.14 million 983km^2	Located in the Yangzi Delta region, the city has more than 2500 years of history. Until 1977, 90% of the city's income was from agriculture, but now the ratio of primary, secondary and tertiary industry has become 6:60:34, due to the rapid development of Township and Village enterprises (TVEs). In 1997, its GDP reached 24.5 billion yuan, which is 35 times that of 1977. It well represents the characteristics of the region which is undergoing rapid growth of TVEs and rapid urbanization.
Dalian City	North Eastern China Liaoning Province 5.30 million 12,574 km^2	While famous as a comprehensive industrial city in China, which includes machining, petroleum, chemicals, metallurgy, building materials, and the textile industry, the city is also an academic and cultural city with many universities and research institutes. The city has largest industrial production in Northeastern China, where many state owned enterprises are located, and thus economic activities are not as robust as in Southeast China. Much attention is paid to environmental protection, and it has a relatively good environmental status among industrial cities. An active international environmental cooperation program is in effect in the city.
Ulsan City	Southern Korea Near Pusan City 0.991 million 1,055.55 km^2	Established as a city in 1962, it is one of the most industrialized cities, and a symbol of the economic development, urbanization and environmental problems in Korea. During the 34 years up to 1996, its population had multiplied by 12 and its urban area expanded by 6 times the original. There are many large industrial complexes of petroleum and heavy industries. With 2.18% of the country's population and 1% of the number of enterprises, it has a 10.7% share of the GNP, 12.4% of total exports and 13.3% of imports. Because of the concentration of heavy pollution industries, the city's air and water were once seriously polluted. This situation is improving due to recent environmental management measures.

Name of City	Country/ Location/ Population/ Area	Major Features
Ansan City	Northern Korea Suburb of Seoul 0.55 million 144.77 km^2	Constructed since the publication of the master plan for creating the Panwol city area to accommodate 1 million habitants. Located in the southeast part of Seoul, Ansan is an industrial city located by the sea. There are about 1600 small-to middle-sized enterprises located in 3 industrial complexes, and some of them have been relocated from Seoul to reduce pollution there. Major products include textiles, chemicals, and automobile components. It is the first totally planned city in Korea. Industrial zones and residential zones are completely separated. The city has a high road land ratio of 28.4% and a high green land ratio of 54.8%. As an industrial city, Ansan is making efforts to improve its environment in fields such as wastewater management and waste recycling.
Kitakyushu City	Kyushu Island, Japan Fukuoka Prefecture 1.016 million 483.15 km^2	Developed as a representative industrial city in Japan, with the aggregation of major industries such as chemicals and steel, it experienced rapid growth during the high growth period of the Japanese economy from the 1950s. Because of its intensive air and water pollution, words like “seven colored smoke” and “death sea” were used to describe the situation. With public awareness of the problem, the city took strong measures to control pollution, and has finally successfully overcome public pollution problems. This experience is expected to provide a good model for other Asian cities that have entered a rapid growth era and are facing severe environmental pollution. Awarded the “Global 500” by the United Nations.
Ube City	West end of Honshu Island, Japan Yamaguchi Prefecture 0.176 million 210.39km^2	One of the starting points for Japan’s experience in overcoming pollution. Developed with coal mining industry, it has experienced air pollution caused by coal mining and combustion. Under the leadership of scholars, much action has been taken to control pollution sources, as well as to plant trees to improve the environment of the city. These efforts were made with close cooperation among citizens, the private sector and the municipal government. This unique process was called the “Ube Model”, and is highly valued by the international community. Awarded “Global 500”.
Tangerang City	Suburb Jakarta Indonesia 2.42 million 1,110 km^2	Located in the west of Jakarta. With the emergence of the mega-city, many residents of Jakarta are moving to suburban areas. Tangerang is one of the recipients of this immigration, and is growing rapidly. The urban population growth of Tangerang reached 5.7% in 1994. Secondary industry, trade, and service are major industries of the city. Environmental effects of urban sprawl, development of satellite towns surrounding mega-cities, and urban-rural relationships will be major research concerns in this city.

Forest Conservation Project

Hiroji ISOZAKI

Project Leader

1. Outline of the Project

1.1 Background

Forests are important, not only for the production of timber, but also for the conservation of biodiversity, generation of water, and prevention of global warming. However, natural characteristics of forests differ according to location. Even for forests with the same natural characteristics, desirable management methods vary from place to place, because local people have different perceptions of and uses for forests. In addition, some countries place national importance on the production and exporting of timber, making it difficult to conduct scientific and objective discussions of alternative policies and actions based on common global criteria.

Forest conservation was one of the key issues at the United Nations Conference on Environment and Development (UNCED) in 1992. Although it adopted "Agenda 21", which called for actions to prevent deforestation, and the Forest Principles, the Earth Summit failed to conclude a Forest Convention. Since then, a number of international initiatives have emerged, such as the Intergovernmental Panel on Forests (IPF), the World Commission of Forests and Sustainable Development (WCFSD), and others, in order to find ways to halt worldwide deforestation and the degradation of all types of forest lands. At the Special Session of the General Assembly of the United Nations to Review and Appraise the Implementation of Agenda 21, in June 1997, it was agreed that work should be continued in order to reach an international consensus on forest conservation. The task of shaping concrete actions by the international community was given to the Intergovernmental Forum on Forests (IFF), which expects to create international solutions on this matter critical for all human societies.

In the past, most forest-related debate has tended to focus on the forest sector only and the direct causes of deforestation and forest degradation, not on cross-sectoral aspects or underlying causes (such as the connection between forests and societies) which are linked to them. Non-governmental organizations (NGOs) took the initiative on one of the most pressing agendas, and started a research project on the underlying causes of deforestation and forest degradation after the UN Special Session. The IFF organized a global workshop on this matter in early 1999, in addition to case studies that were conducted by some governments and international NGO research teams. This research team wishes to present its research findings to these intergovernmental processes.

The International Tropical Timber Agreement (ITTA), revised in 1994, set out in its basic objectives a goal to be achieved by the year 2000 that the international timber trade should be derived only from sustainably managed forests, and encouraged international cooperation to facilitate the achievement of this goal in developing countries. In 1995, criteria and indicators for the sustainable management of temperate and boreal forests were adopted. However, these agreements set out general obligations and guidelines, and actual methods for domestic implementation were not specified.

1.2 Goals and targets

Forest conservation is one of the key problems for the world, and the development of a strategy for sustainable forest management is most urgently needed. However, comprehensive study of forest conservation has just begun. This research project seeks to prepare a strategy for the conservation and sustainable management of forests in the Asia-Pacific region, and to propose necessary supporting legal measures and policies, as well as basic elements to be included in a world forest convention, negotiated at the international level, and based on analysis and examination of forests in other regions, including boreal forests.

To that end, both domestic and international aspects of forest issues were analyzed. In particular, existing conditions and obstacles preventing the resolution of forest issues were examined at the local production level and the domestic and international trade levels, as well as the underlying causes of deforestation and forest degradation.

At the local production level, it has been widely recognized that forest management should be based on participation by local people. This research project aimed to propose a management system for local forests as local commons, based on local people, as well as a system for the management of forest as national commons, based on supervision and

participation by the general public in each country.

At the trade level, this project analyzed and examined actual cases of timber and non-timber products trade, and proposed necessary control measures for ensuring that exports of timber occur only from sustainably managed forests. It also examined a proposed timber certification system, as well as restrictive measures for consumers and other necessary measures.

1.3 Method and approach

In order to avoid any duplication of work in this field, results and information of research activities on forest conservation should be collected as often as possible. To clarify the underlying causes of deforestation and forest degradation, the dependence of local societies on the timber trade in different countries was analyzed from a historical perspective, with the goal of proposing alternative means of social development and civilization for the future.

For participatory management systems, theoretical analyses and examinations were carried out in various fields of social science. In order to identify effective policies and actions, on-site research was conducted on such issues as land ownership and traditional forest utilization, relevant legal systems and administrative institutions, decision-making processes of local communities, the role of village meetings, and forestry systems in the Asia and the Pacific region. Field research was also carried out on desirable ways to utilize forest products, and the use of forests for recreation or tourism, paying special attention to equitable sharing of the benefits derived from forests. The roles of environmental impact assessment procedures and social impact assessment procedures were also examined, based on actual cases.

Econometrics and other restrictive measures at the consumer level were analyzed and examined in current timber trade, at both the domestic and international levels, as well as timber certification systems, in comparison with existing labeling systems.

This project was be organized into sub-task groups focusing on four sub-themes: structural analysis, timber trade, participatory management, and legal and administrative measures.

First, under the sub-theme of Structural Analysis of Regional Forest Destruction and the Underlying Causes of Deforestation and Degradation, researchers identified the relationship between the region's deforestation and the degradation of forest land, and processes of social change (or the impact of the main streams of human activities) which affect forest areas and land use. The sub-theme also provided recommendations on the on-going IFF processes, in particular, discussions on the "Underlying Causes of Deforestation and Degradation of Forests." This sub-theme also clarified what kind of changes would be necessary in the relevant societies, and made a number of policy recommendations.

Second, under the sub-theme of Timber Trade Policy to Support Sustainable Forest Management, the research team studied the effects of timber trade policy on forest resources and forest management in order to create desirable timber trade schemes to support sustainable forest management. For that purpose, the team researched the structure of the timber trade, built an econometric model to describe timber trade structure, and evaluated the effects of timber trade policies on social welfare. The project also evaluated the effects of timber trade policies on forest resources, and proposed strategic policies for the trade of forest-based products, to support sustainable forest management.

Third, under the sub-theme of Participatory Forest Management, researchers presented and specified feasible strategies to facilitate participatory forest management systems. They carried out field research on forest utilization by forest dwellers in selected local areas, analyzed their economic, social, and cultural characteristics, examined participatory forest management plans from the view point of local people, and proposed alternative national forest management policy.

Finally, under the sub-theme on Legal and Administrative Supporting Measures for Sustainable Forest Management, the project identified legal principles which ensure, facilitate, assist, support, promote, and accelerate the sustainable management of forest areas, based on an analysis of international treaties related to forest management, referring to an Asia-Pacific perspective and philosophy. Relevant domestic laws and regulations were examined, attaching importance to the actual results of their application, in order to identify and develop legal and other measures based on substantive and social justice. Researchers also examined environmental impact assessment procedures, and proposed supporting measures for law enforcement and administration. Based on its research, the project made recommendations for the legal and administrative aspects of forest management.

Research under this sub-theme will also clarify legal and administrative measures for sustainable forest management and the effective participation of local people. These measures are necessary for the implementation of the actions recommended under the four sub-themes in legal and administrative systems related to forest management.

The Forest Conservation (FC) Project has been carried

out according to the following schedule.

a. First Year (April 1998–March 1999)

Main subjects: current status and problems of forest conservation; ownership of land; traditional utilization of forests; relevant legal systems and administrative institutions; decision-making procedures in local communities; the roles of village meetings and foresters; non-timber products and their utilization; timber trade control.

b. Second Year (April 1999–March 2000)

Main subjects: a desirable forest management system; necessary legal supporting methods; desirable involvement and participation system for people; relevant laws and regulations; an environmental impact assessment system; social impact assessment system; swidden system management.

c. Third Year (April 2000–Mar. 2001)

A draft of IGES Policy Recommendations on Forest Conservation in the Asia-Pacific was developed in the following manner.

(1) In April and May, the FC Project listed the key elements for country-based strategies, focusing on each country's differences, and based on research results.

(2) At the end of May, a workshop was held in Japan to examine the key elements of the forest strategies.

(3) From June to September, workshops were held in conjunction with local researchers in target countries, government representatives and NGOs in Indonesia and Lao P.D.R. to examine, with a view to amendment, strategies focusing on differences in conditions in each country.

(4) The FC Project and other researchers region further examined the preparation work for the final version of a strategy for sustainable forest management in the Asia-Pacific.

(5) In January 2001, the final international workshop was held to discuss the proposed IGES Forest Strategies with representatives from international organizations, such as ITTO, the Center for International Forestry Research (CIFOR), relevant government sections, and NGOs.

(6) The IGES strategy was publicized through these processes.

1.4 Major findings

Through the above processes, the following points were revealed.

First, in the target countries (Indonesia, Thailand, the Philippines, Vietnam, and Laos) we identified the "external constraints" on local participation in forest management by clarifying the gaps and contradictions between national land/forest policies and "customary land rights and forest/land management by the local people." Second, we identified the economic, social, and cultural "internal constraints" present in the local communities. Third, "possible main actors" were clarified by evaluating the local realities and national forest policies. In addition, we identified the lessons learned from public participation in developed countries. Based on these examinations, we elaborated these draft policy recommendations[1] by considering how to overcome the internal and external constraints, and suggested that the main actors carry them out.

In particular, the series of policy dialogue workshops held in Jakarta, Vientiane, and Khabarovsk, Russia have provided opportunities for the FC Project to influence the policymaking process. For example, the policy dialogue workshops held in Jakarta and Vientiane with local officials and community members who were in charge of forest management provided precise analysis and interpretation of existing environmental treaties and their resolutions, aiming to promote awareness and recognition of the international regime at the local level. In these two workshops, necessary legal and administrative measures also contributed to facilitate collaborative work and discussions.

Field research activities for the purpose of grasping the actual situation of forest management at a local level have greatly contributed to influencing the policymaking process at this level through discussions with local officials in charge of forest management. Policy recommendations developed under the PM sub-theme also contributed to discussions with policymakers at the international workshops held in Jakarta and Vientiane. Moreover, the international workshop in Khabarovsk, held by the Project in September 2000, provided an opportunity for collaboration with several key organizations in the Russian Far East (RFE), and provided local key stakeholders with an opportunity to engage in a policy dialogue and develop concrete strategies for forest conservation.

1.5 Conclusion

The first phase of the IGES Project on Forest Conservation attempted to identify principles and

measures for sustainable forest management (SFM), based on experiences in the Asia-Pacific region. Extensive studies were carried out within a framework of four interrelated sub-themes by in-house research staff, visiting researchers, and many outside collaborators. Based on the diverse research activities that were conducted, including four International Workshops and three local policy dialogues organized by the FC Project, the project reached many useful conclusions relating to each sub-theme.

The structural analysis of forest destruction confirmed that the root causes of forest destruction include an "insufficient base of local participation and community rights" and the "impact of market forces under an incomplete market system," as well as the "forest development paradigm with industrial emphasis," and "economic and political instabilities."

The participatory forest management (PFM) policy sub-theme categorized existing PFM into several types, based on its main actors and the legal status of forest land and activities, and made policy recommendations,[2] based on their examination of internal and external constraints on participation.

The timber trade policy sub-theme conducted time-series economic analyses of the timber trade in the Asian market, and collected data for space equivalent analysis[3] of the timber trade.

The legal/administrative sub-theme focused on international legal measures related to SFM, international processes for policy dialogue on forest issues, and domestic legal/administrative measures relating to PFM. This sub-theme elaborated the principles and measures for sustainable forest management with special reference to local participation in SFM, in cooperation with other sub-themes.

Other specific issues regarding forest management, such as conservation of biological diversity, trade control, and protection of intellectual property, are some of the key concerns in the debate over the practices of the World Trade Organization. The United States and European Union made their own models, whereas the Japanese government and other Asian countries did not. Some members of the FC Project participated in this debate and carried out preparatory research work on these points, in order to examine a suitable system for participatory forest management in line with the main trends of international negotiations regarding biological diversity, resource management, trade control, or intellectual property.

Our research activities have largely been carried out by project members. However, forest issues relate to various other academic fields, and our activities have been supported by a large number of outside collaborators, consisting of NGO activists, governmental officials, and academics searching for suitable participatory management methods for stakeholders. Such a research structure and methodology contributed to supplementing the relatively small research unit, provided information based on the local situation, and established cooperation networks with relevant stakeholders in the region. These networks would be a very useful basis for further activities in the Project's second phase.

2. Self-evaluation of the Project

2.1 Originality

The FC Project is original in the sense that it has been conducting comprehensive research that deals with the complexity of the forest issue. In order to conduct comprehensive research, the FC Project conducted research on the four following sub-themes: (1) structural analysis on causes of forest loss (ST), (2) timber trade policy (TT), (3) participatory forest management (PM), and (4) legal and administrative measures for forest conservation (LA).

One of the unique facets of the ST sub-theme is the interdisciplinary, diverse research that identified the economic and social structures of the leading causes of forest loss at local, national, regional, and global levels in nine countries, ranging from tropical to temperate and boreal forests. Special mention should be given to positive participation in the IFF/NGOs UC (underlying causes of deforestation and forest degradation) process that are aiming to develop an international forest policy and maintain policy dialogue in international society. These unique approaches provided basic perspectives for other sub-themes regarding the issues to be examined in order to identify measures for sustainable forest management.

The TT sub-theme is original in that it integrated resource accounting, forest/timber certification schemes, econometric analysis, and spatial equilibrium analysis. Although the sub-theme could not effectively cover timber trade to forest resources because of the lack of appropriate data, it confirmed the fact that free trade is not an absolute solution to environmental problems.

In terms of the PM sub-theme, the integrating of national policy studies and local field studies in order to elaborate policy recommendation for participatory forest management in Southeast Asian countries can be underlined. In particular, this sub-theme illustrated the internal social, economic, and cultural constraints that are predominant in local communities and external constraints that prevent local participation. This methodology and framework were successfully used to develop policy recommendations.

The sub-theme of LA is original in that it analyzed international law requirements and actual local necessities in order to clarify the desirable legal measures for sustainable forest management. To that end, the Project carried out research on the identification of enforcement and compliance provisions in the relevant environmental treaties. It also conducted research on basic legal elements[4] to be included in the proposed world forest convention, on new trends in several domestic laws on forests, and on cases on forest-related conflict resolutions. It has also conducted research on basic legal elements to be included in the proposed world forest convention. However, since the FC Project, in its second phase of research decided to focus on the domestic issues based on recommendations of the IGES Project Review Process, the LA team shifted its task to new trends in several domestic laws on forests and to cases on forest-related conflict resolutions.

Among various forest-related stakeholders, the FC Project places great importance on local people, with special reference to their participation in forest management. Their meaningful participation is indispensable for enhanced implementation of forest management, both at an international and a local level. This has been widely recognized in international society, but concrete legal and administrative measures have yet to be identified and proposed. Thus, the theme and method of the project has been appropriate and very timely for forest-related stakeholders, especially local people. Our research activities have also been supported by a large number of outside collaborators, consisting of NGO activists, governmental officials, and academics searching for suitable participatory management methods for stakeholders. In addition, NGO activists and academics plan to begin and continue a policy dialogue with the government. The international workshop provided them with an opportunity to engage in policy dialogue.

2.2 Achievements

In the studies on ST, the Project succeeded in addressing the key underlying causes of forest loss in the region, which is comprised of both production and consumer countries, including the northeast Asia sub-region. The coverage of such a wide range of countries should be recognized as a significant achievement, although many of the causes of environmental degradation had already been pointed out in existing studies. The Project also succeeded in confirming the intervention of the behavior of the consumer society on forest loss in industrialized countries: e.g., analysis on trade of Lao cypress, and study of the impacts of China's policy changes on the China–Russia timber trade. Any existing research has clarified a reliable timber flow from the RFE to Asian countries.

As for the sub-theme on TT, research on resource accounting analyzed how forest-related accounts are linked together. Investigation of the forest/timber certification scheme revealed the need for such a scheme in Asia. Econometric analysis and spatial equilibrium analysis, along with trade policy study for several countries, made it clear that environmental consideration and the argument about enterprise in its infancy are important in forming timber trade policy.

Regarding research on PM, national policy studies and local field studies were conducted separately by different researchers. Usually, policy studies have a tendency to neglect the local reality; field studies are weak in developing policy recommendations. The research of the Project overcame the problem of integrating these two studies mentioned above.

Research activities on LA were carried out separately by different researchers. Governmental negotiations on forest issues at the global level sometimes neglect the actual local status within the sovereign state. On the other hand, relevant international legal instruments do not recognize the rights and duties of local authorities and communities. The research of the Project combined both approaches.

The Project has tried to disseminate research outputs[5] and exchange information related to forest conservation issues in the region on various occasions, such as at international meetings and workshops organized by IGES, etc. In international society, active collaboration and participation at the Asia regional workshop and the global workshop of the IFF/NGOs UC Process have provided good opportunities to make public the urgent need for in-depth studies on the causes of forest loss and continuous policy dialogue to overcome the underlying causes of unsustainable forest use. With respect to IGES activities, the series of policy dialogue workshops, held in Jakarta, Vientiane, and Khabarovsk, also provided opportunities to influence the policymaking processes. For example, the international workshop in Khabarovsk, held by the Project in September 2000, provided an opportunity for collaboration with several key organizations in the RFE, and provided local key stakeholders with an opportunity to engage in a policy dialogue and develop concrete strategies for forest conservation. In the policy dialogue workshops held in Jakarta and Vientiane with local officials and community members charge of forest management, the Project provided precise analysis/interpretation of existing environmental treaties and their resolutions, aiming to promote awareness and recognition of the international regime at a local level. In these two workshops, necessary legal and administrative measures also contributed to facilitate collaborative

work and discussions.

Field research activities for the purpose of grasping the actual situation of forest management at a local level contributed to influencing the policymaking process at the local level through discussions with local officials in charge of forest management. Policy recommendations developed by the PM sub-theme also made contributions through discussion with policymakers at the international workshop held in Jakarta and Vientiane.

2.3 Management

We believe that most of the activities were conducted successfully, with the exception of some unexpected matters. ST research activities generally achieved the expected results, in spite of handicaps that arose when the original sub-theme leader resigned due to illness. We believe that conducting research in Northeast Asia, including the Russian Far East and China, represents a significant progression of the theme in the first phase. However, we could not conduct enough case studies on the impacts of overseas investment on forest loss, because it was difficult to allocate a sufficient budget to the study and to find appropriate research collaborators.

Regarding research on TT, it can be said that the research was successful in elaborating timber trade policy recommendations for sustainable forest management in the four countries of Indonesia, the Philippines, Malaysia, and Korea. In general, our research achievements are academic, in that they can be applied equally to other countries. Many of the objectives scheduled at the initial stage of the project were accomplished well. However, further elaboration is still needed. The Project has been carried out in accordance with the plan set forth at the beginning of the first phase. However, with more time and greater monetary and personnel resources, a higher level of integration could be achieved in this sub-theme.

Research on PM was also successful in elaborating policy recommendations[2] for participatory forest management in Indonesia, the Philippines, Vietnam, and Laos. But the project was abandoned in the case of Thailand, because the issues concerned became quite sensitive to a collaborator in the process of enacting community forestry law. It is concluded that almost all the objectives scheduled at the initial stage of the Project were accomplished well. The research on PM has generally achieved the expected results. But we could not get enough information on cultural aspects of target communities, because the time allocated for field study was too short.

Regarding research on LA, almost all activities were completed successfully. In particular, analysis on international treaties and the inter-governmental process related to forest conservation indicates necessary principles and measures for realizing sustainable forest management. These principles and measures form the basis for policy recommendations for sustainable forest management as a result of the Project. Regarding analysis of domestic laws in target countries, we grasped the current situation of laws related to forest management and participation of local people, although we faced difficulties in gathering detailed information and documents due to language barriers.

A budget was allocated to the activities carried out by full-time staff and collaborators (as commissioned research). Needless to say, the budget allocated to full-time staff was managed efficiently. The results obtained as a result of activities carried out by collaborators compare favorably with the budget allocated. The budget allocation was utilized very efficiently. This can be said because the project covered a vast area and many countries in the Asia-Pacific region, and such ambitious research requires a much larger budget than was allocated to the FC Project if all research is carried out by full-time IGES staff. Commissioned research carried out by research collaborators supplemented the research activities of full-time staff, and they provided informative suggestions on developing the reports.

Moreover, full-time Project staff contributed activities on funding from outside IGES. For example, donations from the former ministry of post and telecommunication, the Japan Society for the Promotion of Science, and the Foundation for Advanced Studies on International Development.

3. Summary of the evaluation

The Forest Conservation Project was evaluated by two Research Advisory Committee (RAC) members (Dr. Sonja Vermeulen of the International Institute for Environment and Development and Ms. Wan Portiah Hamzah of the Institute of Strategic and International Studies, Malaysia), ten external evaluators, and six other knowledgeable persons who answered a questionnaire. All evaluators gave scores on the Project, however, many did not provide any explanation for their scores, and some evaluators wrote rather general comments. Evaluation on the project plan, project achievements, and project management, mostly referred to IGES as a whole and did not link directly to the FC Project. However, the comments related to the FC Project are included in the following summary.

3.1 Evaluation by RAC members

Overall, the Project was successful in terms of tight focus, good themes, realistic targets, and clear structure. It had an interesting approach, selected interesting areas of study, and chose countries facing economic and political changes, therefore offering different ways and means on how values and concepts frame environmental debates.

The Project also had a clear and effective research plan framework, and efficient, focused execution and presentation of research. The targets were realistic and targeted to produce work that is timely and well presented. It was highly successful in achieving its research agenda, with a combination of local, national, and international levels. The reviewers found that the use of workshops is an effective way to share lessons from research.

The project management structure was clear and workable. The budget was realistic, the schedule was appropriately set, and personnel and financial resources were effectively distributed.

On the other hand, the Project had some weaknesses. One evaluator thought that the focus on international issues may have excluded the viewpoints of some stakeholder groups. The originality of the research did not compare well with concurrent research by other organizations in the region. Results tended towards the general and superficial, with a low level of analysis and poor linkages between findings and policy implications. The policy outputs from the Project were highly prescriptive and included little consideration of policy as process.

3.2 Evaluation by outside experts

External evaluators agreed nearly unanimously that the theme of the Project is appropriate. The Project responded to (growing) needs of society and has the possibility to connect to climate policy. It was also relevant to the broad mandate of IGES—because forest conservation is an important component of sustainable development. Evaluation on the appropriateness of the project approach to the themes also received high scores, though some evaluators did not put comments with the score they gave. Some comments on this item were ‘development of a new perspective is necessary’; ‘the collection of data through field research provided an interesting perspective on what takes place on the ground’; ‘innovative’; ‘very appropriate.’

As for the evaluation of the contribution to the international community, the first phase of the FC Project was not so satisfactory. Three out of ten evaluators (30%) gave an average score (C) on this point. Their comments were as follows: ‘Analysis on causes of forest loss and timber trade policy can be utilized as materials’; however, ‘results provide strategies which are not connected with policies of the government of Japan’; and ‘the results are satisfactory but do not lead to concrete proposals.’ Those who gave high scores (A, B) on this point explained: ‘this is an important element of the global sustainable development agenda’; ‘it may be useful to develop links to the United Nations Forum on Forests (UNFF)’; ‘reasonable, but it depends on the level of implementation of results, outputs, etc., and follow-up activities.’

Finally, it is necessary to list recommendations, suggestions, and expectations which the evaluators expressed either explicitly or implicitly.

a. Issues to study

The FC Project needs to

(1) adequately analyze measures to bridge the gap between local and international levels;

(2) study cleaned production and desertification;

(3) produce high quality reports on topics of global interest, which will contribute to development of environmental policies and implementation of sustainable development (common);

(4) put the research targets on the global view of genetic resource and biotechnology, biodiversity, sustainable forest management, climate change, carbon sequestration, soil, water, fire, deforestation, forest degradation, and desertification;

(5) provide basic information of target countries (population, area of forest, etc.).

b. Approach, methodology, and quality

The FC Project needs to

(1) establish focal points in each target country (this suggestion applies to other IGES projects as well);

(2) in research, move towards an inter-disciplinary, problem-solving approach;

(3) enhance biophysical and social research capacity;

(4) adjust the project methodology in the future outputs, because implementation at the local level is rather weak;

(5) maintain a long-term perspective on project activities, due to the nature of forest issues which take a long time for determining the effectiveness of policies.

c. Links and collaboration/cooperation

FC Project needs to

(1) develop better communication and collaboration with concerned persons of the Ministry of Environment of Japan (request);

(2) develop links with the UNFF;

(3) explore links to the Asia-Pacific Economic Cooperation (APEC) process (common);

(4) seek closer collaboration with other research organizations in target countries;

(5) improve networking elements by organizing series of local-level seminars, training courses with local farmers, etc.;

(6) invite collaboration with the United Nations University (UNU) project on Research and Capacity Development for National Forestry Programs in Countries with Economies in Transition.

d. Treatment of outcome/results

The FC Project needs to

(1) bring the influence of the project outcomes to local and international levels by implementing project outputs and guidelines into the national forest programs of particular target countries;

(2) clarify how and where the results will be used. Country-oriented research will need to emphasize local implementation through local groups, communities, or government;

(3) implement model projects, based on research results;

(4) contribute to discussions at the international level, based on the research results.

4. Epilogue

Forest issues arise at international, national, and local levels, requiring action at each level. Such actions should be harmonized, and research and measures with broad perspectives and multilateral approaches are indispensable. A small project is not capable of coping with or tackling all such activities.

Based on this recognition, the activities of the first phase aimed to grasp the actual local situation of forests and forestry in the Asian region, without limiting the level and methodology, and planned to propose concrete actions and guidelines in the second phase. Regarding the broad coverage of the project plan, opinions have been raised at meetings of the IGES Boards of Directors and Trustees suggesting to limit the purposes, target countries, academic fields, methodologies, or levels. Although those opinions varied, the Project was guided to place, as its base, the promotion of participatory forest management at local levels through suitable national measures. Thus, contribution to international negotiations on world forest issues was given secondary importance in the first phase, as well as in the second phase.

In general, evaluations on the Project by outside experts do not differ greatly from the self-evaluation, but a few evaluators presented different views and opinions. This accurately reflects the broadness and complexity of the forest issues mentioned above, and also shows the need to carry out further research activities.

Several items among the 20 items listed at the end of the previous sub-section have already been incorporated into the Second Phase Plan, as explained before. On the other hand, for items that are not clearly mentioned in the Second Phase Plan, due consideration will be given in the implementation process. Although the project resources for contribution to international negotiations on world forest issues are very limited, as the Project focuses on local level participation, the progress of such negotiations will be followed to the extent possible.

The support and assistance kindly provided to the first phase of the FC Project are greatly appreciated. Based on the achievements from the first phase, the members of the second phase of the FC Project will make the utmost efforts to produce excellent research results.

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[1] IGES Forest Conservation Project (2001) "IGES Policy Recommendation on Forest Conservation in the Asia-Pacific," Proceedings of the Fourth IGES International Workshop on Forest Conservation in the Asia-Pacific, 17 January 2001, Hayama, IGES, 191 pp.

[2] The policy recommendations developed by PFM sub-theme are an integrated part of the afore-mentioned IGES Policy Recommendations.

[3] Space equivalent study: It is one kind of general equilibrium analyses, specifying the same commodity or goods locating at spatially different places as different commodities or goods, and to study equilibria among these goods. For example, one goods located at place A can be produced with the same goods at place B with other inputs, as transportation efforts. These settings enable to understand production and trade among spatial regions.

[4] IGES Forest Conservation Project (2001) "Report of the First Phase Strategic Research: Forest Conservation,"

Hayama, IGES, p. 58, Box. 1.

[5] Research outputs of the first phase are 1) research reports that have been compiled in three volumes of "A Step Toward Forest Conservation Strategy" 1, 2, and 3; 2) IGES policy recommendations mentioned above. The documents are also available on the FC Web site: http://www.ige.or.jp/fc/index-e.htm

Environmental Education Project

Osamu ABE

Project Leader

1. Outline of the Project

1.1 Background

Environmental education is one of the most effective strategies for increasing general levels of public environmental awareness, developing skills for solving environmental problems, and maintaining and improving quality of life and the environment. Many countries and environmental NGOs have developed environmental education programs to actively pursue these goals. The aim of environmental education has been modified to emphasize "education for sustainability," which has broad implications, not only for environmental education, but also for development, poverty, population, and gender. Through this approach, it is expected that environmental education will promote environmentally sustainable societies throughout the Asia-Pacific region.

However, some countries still feel the need to focus more on national economic development than on social and ecological sustainability and, unfortunately, environmental NGOs and other progressive organizations within these countries are often not strong enough to support effective environmental education. Nevertheless, this situation is changing, and in recent years many governments, NGOs, and corporations have been increasingly willing to collaborate on developing a wide range of educational activities which encourage environmental protection and promote sustainable development through a broadened approach to environmental education, known as education for sustainability.

International bodies and programs, such as the United Nations Educational, Scientitic and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP), the Japan–U.S Common Agenda, and the Environmental Congress for Asia and the Pacific (ECO ASIA) have also been active in supporting environmental education. Despite these initiatives, several issues still need to be addressed.

Major issues include identifying problems and the current condition of environmental education in these regions, developing strategies for effective curricula and professional development, developing appropriate media and technologies for environmental education, and designing and supporting networks. Thus, the primary focus of this project is to enhance awareness and concern for issues of environmental quality through a program of capacity building in environmental education, action, research, and community development for the enhancement of quality of life and the environment in the Asia-Pacific region.

1.2 Goal and targets

The primary purpose of the Environmental Education Project (EE) is to promote and foster eco-consciousness in relation to an environmentally sound and sustainable society, and the wise use of resources in the Asia-Pacific region.

The EE Project identified two aims to achieve this purpose: (1) to develop a comprehensive regional strategy on environmental education, and (2) to establish an international network for the implementation of an environmental education strategy in the Asia-Pacific region in order to improve the quality of the environment. The result is expected to contribute to Asian-Pacific perspectives on environmental education. To achieve these aims, the Project established the following research objectives.

- To develop and propose proven means for encouraging all countries in the region to implement appropriate environmental education programs.
- To design and support networks which provide generic assistance to countries, areas, and NGOs in the region in order to encourage and improve environmental education.
- To propose collaborative projects with other countries in the region to promote the improvement of environmental education.

1.3 Method and approach

The methodology of the Project is guided by the principles of synergy, partnership, and participatory exercises. It had a three-year time-frame, and its activities were broken down into the following five phases.

Phase 1 - Assessment of the state of environmental education in the region

A preliminary review of environmental education activities was conducted in the region. Based on this assessment, some countries were selected as sites for case studies to gather additional information. Secondary data and participatory techniques were used to undertake case studies.

Phase 2 - Identification of key issues and development of principles and guidelines

Data and information obtained from the status reports and case studies were analyzed to identify key issues in environmental education. This information was used to determine the range of strategies used, understand the context and other factors influencing the relative degree of success of environmental education activities, and identify the obstacles faced and mechanisms used to overcome these problems. This analysis was used to develop principles and guidelines for "successful practices" in environmental education in each of the four areas: business and industry, non-governmental organizations, the media, and schools.

Phase 3 - Development of a framework for strategy

Workshops and seminars involving regional specialists, experts, and national collaborators were organized to review and revise issues, principles, and practices obtained in phase 2, and then a draft framework for a comprehensive regional strategy was prepared.

Phase 4 - Development of a comprehensive strategy

A draft strategy was prepared within the accepted framework of principles and guidelines. It was then discussed and revised in workshops, with the help of regional experts, specialists, and national collaborators.

Phase 5 - Publication and dissemination

The strategy, as a guideline for its realization, was published, and information was disseminated to agencies responsible for, and concerned with, environmental education in the region.

1.4 Major findings

The EE Project, based on the research targets, divided its research into two parts: a comprehensive study of environmental education in the Asia-Pacific region; and sector based research. Moreover, the Project adopted three measures in the process of the research: investigation of the status of environmental education in the Asia-Pacific region; implementation of several case studies; and the organization of various meetings and conferences. In addition, development of the necessary networks was also considered. Data and information collected through research during the three years were compiled in the form of proceedings, reports, and papers. Concerns and issues were incorporated into the "Regional Strategy on Environmental Education in the Asia-Pacific region"[5] (Figure 1).

This summary report chiefly refers to the following three points, resulting from the outputs of the Environmental Education Project research activities: (a) an overview of thirty-six status reports, (b) sectoral research outcomes, and (c) a regional strategy on environmental education in the Asia-Pacific region.

a. Overview of 36 status reports

The findings of the status report[1] reveal that environmental concerns have been incorporated in all forms of education (formal, informal, and non-formal), and that these countries are aware of, and responsive to, environmental concerns. Major characteristics and trends are briefly summarized below.

i. Great diversity

The continent of Asia is the largest in the world, and is economically, environmentally, and culturally diverse. The continent is so wide that it covers about 23 percent of the world's total land area and houses about 60 percent of its population. It has land-locked and sea-locked countries, archipelagoes, and small islands developing states (SIDS). The region also houses major religions of the world: Hinduism, Buddhism, Islam, and Christianity.

ii. Environmental education as a new perspective

Environmental education is perceived as a new approach to education in both formal as well as informal education. It is offered in the form of a composite course (at the primary school level), an integrated course (at the high school level), and optional courses (at the tertiary level).

- There is a progression towards "environment-alizing" the curriculum and other programs.
- "Teaching-learning" is based on field studies and emphasizes the direct involvement of students. Approaches include environmental camps, street theatre, issue-based approaches, collaborative problem-solving, junior eco-clubs, green consumerism, field studies, and so forth.
- Environmental concerns have been incorporated into social science as well. In other words, they are incorporated not only in physical science but also in social science.

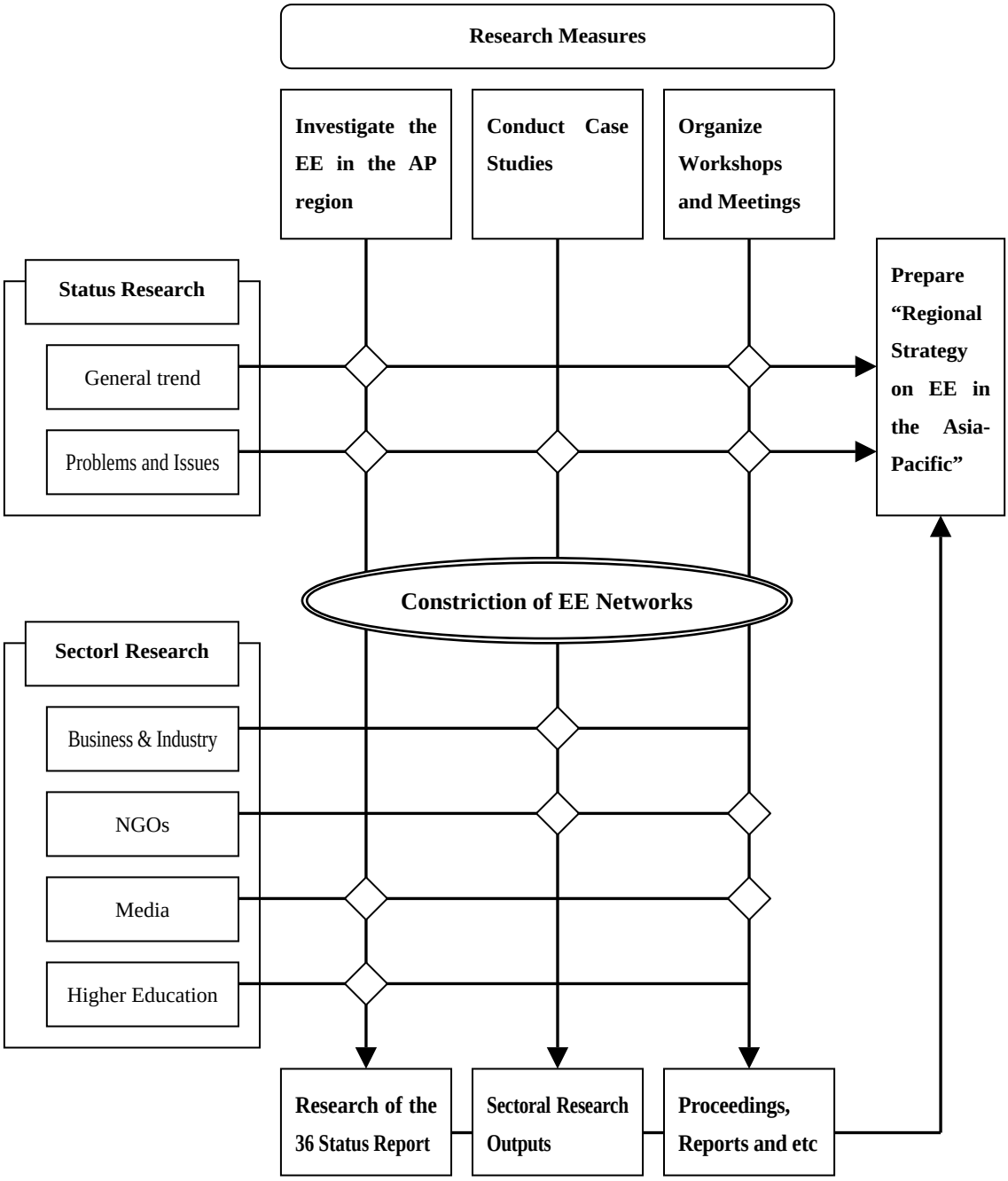

Figure 1. Stricture of the Project Research

iii. Successful examples

The region is rich in examples of successful environmental education, some of which are given below.

- Cambodia: The government has formed an Inter-Ministerial Steering Committee for Environmental Education to coordinate environmental education at the national level.
- China: China shows how a school promotes environmental education activities among children. For example, under the project "Hand in Hand in the Earth Village" students, with support from teachers, set up an earth village which includes a waste recycling station and a small bank. The proceeds from the sale of recycled products have been used to build two primary schools in Jiangxi Province. The project was initiated in 1996 by Ms. Lu Qin of Yucai Primary School, in collaboration with the China Children Newspaper.
- Fiji: The Fiji National Training Council has undertaken a program called the Levy Grant Scheme whereby private organizations submit 1 percent of their gross salaries to the Council to fund environmental courses for their employees at a subsidized rate.
- India: The Supreme Court of India passed a judgement whereby the University Grants Commission is required to include environmental courses in universities.
- Indonesia: The Ministry of Environment and the Ministry of Education have jointly established Environmental Study Centers (ESC) in state universities. These ministries are jointly responsible for the capacity development of ESC. Indonesia also has established an Environmental Education Network of NGOs to promote environmental education in the country.
- Japan: In order to promote environmental education among children, the Ministry of the Environment has initiated a program called the "Junior Eco-Club." In this program, children are encouraged to form a group of up to 20 and carry out environmental activities. The Japan Environment Association serves as the national secretariat to this club. The Club also publishes a bi-monthly newsletter and conducts exchange programs.
- Korea: In order to nurture the values and attitudes of students towards environmental conservation, the Ministry of Environment designates biennially Environmental Conservation Model Schools and Honored Schools in cooperation with regional boards of education, municipalities and local offices of education.
- Malaysia: In order to educate school children about the environment and its conservation, the Department of Wildlife and National Parks holds camping and nature education courses for school children on weekends and holidays. Working closely with the Ministry of Education, the Department provides the programs, places, instructors, and facilities. The Ministry chooses the schools and students to participate in the program.
- Myanmar: Every school student must plant three saplings in the rainy season—the first one to compensate for the previous use, the second one for present use, and the third one for use by future generations.
- Papua New Guinea: The development of close bonds between people and nature can be found in Papua New Guinea. For example, some clans adopt and name an animal or a plant, without harm to either.
- Tonga: The Ministry of Education coordinates an extra-curricular project called the Plant Project for primary school students. The project emphasizes plant species that are of cultural and traditional importance.

iv. Regional cooperation

Although the formal study of environmental education can be traced back to the Stockholm Conference in 1972, a quick survey of regional environmental education activities conducted by different agencies indicates that the past several decades have shown growing cooperation in, and coordination of, regional and sub-regional environmental education activities. These activities are mainly undertaken by networks formed under the leadership of UN bodies, mainly Principal Regional Office for Asia and the Pacific (UNESCO-PROAP), Regional Office for Asia and the Pacific (UNEP-ROAP), Economic and Social Commission for Asia and the Pacific (ESCAP), and World Conservation Union (IUCN). They have used the concept of sub-region to reach out to vast areas of the Asia-Pacific. Asia-Pacific Network for Global Change Research (APN), another Inter-Governmental Organization (IGO), also has recently emerged in coordinating and collaborating research and training in global environmental change in the Asia-Pacific region. Also, activities undertaken by IUCN, World Wild Fund (WWF), and Asian-South Pacific Bureau for Adult Education (ASPBAE) are commendable.

At the sub-regional level, the establishment of inter-governmental organizations, especially South Asia Cooperative Environment Program (SACEP), South

Asian Association for Regional Cooperation (SAARC), Association of South East Asian Nations (ASEAN), and South Pacific Regional Environment Program (SPREP) has been a positive sign of the promotion of environmental education in the region. The establishment of networks such as South and Southeast Asia Network for Environmental Education (SASEANEE) has been a boost to regional efforts. In the Northeast sub-region, a new framework, called North East Asia Subregional Program on Environmental Cooperation (NEASPEC) is evolving under the auspices of ESCAP, whereas in the Pacific sub-region, several IGOs and the University of South Pacific, including SPREP, provide further opportunities to foster environmental education. Likewise, The International Center for Integrated Mountain Development (ICIMOD), The Mekong River Commission (MRC), and The Greater Mekong Sub-region (GMS) Program are also active in certain eco-regions.

Thus, the major challenge is how to build on and strengthen the existing mechanisms of cooperation in the field of environmental education so that environmental education programs can reach out to the larger area of the sub-region. The international conference held annually under the auspices of Asia-Pacific Center of Educational Innovation (UNESCO-ACEID) in the Asia-Pacific region provides good forums for sharing successful practices and learning new lessons in the field of environmental education.

v. Major problems

In spite of all these successful examples, and the widespread use of environmental education practices and regional cooperation, the region is not free from problems. Indeed, it is riddled with burning issues and problems, some of which are summarized below.

- *No national policy* - With the exception of a few countries there are no national policies in the region. Consequently, resources have not been allocated to environmental education activities. Therefore, they have been completely marginalized in national mainstream activities.
- *Fixed curriculum* - The curricula are rigid and nationally controlled. In other words, education is restricted in a “straitjacket” of a fixed curriculum imposed by the government. The “teaching-learning” is book-based and examination-oriented. There is no freedom to incorporate local environmental concerns in the teaching-learning process.
- *Inadequate infrastructure* - In many places, there are schools, but in ruined conditions, with no walls, or roofs, and sometimes leaking roofs. There are not enough classrooms, and thus the existing ones are congested. In the remote areas of developing countries, it is often the case that there are schools but no teachers, although in some places there are schools and teachers, but no students.
- *Lack of teaching materials* - There is a great shortage of textbooks and teaching materials.
- *Violence and uprising* - Violence, teacher and student unrest, and lack of discipline are also common in many parts of the region.

vi. Great challenges

Some of the challenges facing the region are as follows.

- How to reorientate education systems so as to bring a desirable change in the knowledge, attitude, and practices (KAP) of individuals and communities. Is there any prevalent model of environmental education already succeeding in achieving education for sustainability?
- How to implement environmental education holistically in a locally relevant and culturally appropriate fashion.
- How to foster smart partnership to prevent, stop, and reverse the process of environmental degradation.
- How to implement education so that it can meet the needs of the society as well as the need for environmental education.
- How to address three realms of concern: environment, economy, and society.

b. Sectoral research outcomes

The EE Project conducted case studies on (1) business and industries, (2) NGOs, (3) the media, and (4) higher education to determine practical mechanisms to integrate their strength in a unified way to foster environmental education and public awareness in the region. Brief summaries of their findings are presented below.

i. Business and industries (B&I)

Case studies of four countries (India, Indonesia, Korea, and Japan) indicate that the B&I sector has begun to include environmental education—not to mention environmental friendly activities in their programs. Some of the eco-business activities are exemplary and outstanding in nature, particularly in developed countries. Data from developing countries show that

educational activities are still in the evolutionary stage. In order for the B&I sector to promote environmental education in the region, the following suggestions have been made.

- Develop in-house capacity building.
- Promote green consumerism.
- Develop symbiotic partnerships with other institutions.

ii. Non-governmental organizations (NGOs)

Conclusions from case studies of two countries, Japan (donor country) and Indonesia (recipient country), indicate that environmental NGOs are actively undertaking environmental education activities in these countries. In Indonesia, efforts are under way to promote environmental education, especially through the establishment of a nation-wide environmental NGO network called JPL (Jaringan Pendidikan Lingkungan). With contributions from the Japan–U.S. Common Agenda for Roundtable (CART), the JPL network has been successful in communicating and sharing resources, improving relations with external NGOs, and improving social learning. The studies emphasize the need for international assistance for the development of a network of NGOs, both in donor as well as recipient countries, to promote environmental education activities.

iii. Media

The Media Research Team conducted research on the relationship between journalism and public awareness. According to the Team's report,[2] the mass media are active in, and responsible for, promoting activities that support and enhance environmental education, training, and public awareness, in spite of their cut-throat competition for survival. They are active in lobbying the government for effective implementation of environmental education programs. On the promotion of environmental education, the Team has suggested the following.

- Provide more funds for the development and promotion of environmentally friendly software and information technology.
- Support environmental literacy[3] programs in developing countries.
- Adapt information technology to specific situations.

iv. Higher education

Data from eleven countries were analyzed to study the general situation of environmental education at the tertiary level. Because of vast regional diversities, industrialized countries show a tendency to improve industrial pollution and to incorporate environmental concerns in physical science, as well as social science courses. On the other hand, in developing countries, more focus is given to natural resource management; environmental concerns were incorporated in the 1970s in natural science, but now are expanding to social science courses as well, and international (external) cooperation can be seen in operation. The report suggests the use of the open system approach[4] in promoting environmental education. Other specific suggestions include the following.

- Initiate policy-setting, including the establishment of steering committees.
- Encourage collaboration, such as internships with external organizations.
- Establish facilities for providing training on sound environmental management practices.

c. Regional strategy on environmental education in the Asia-Pacific region

Having considered the concerns and voices raised by environmental educators and facilitators in a series of participatory exercises, and taking into consideration findings from status reports and case studies, the EE Project has formulated a comprehensive strategy entitled Regional Strategy on Environmental Education in the Asia-Pacific.[5] The main objective of the Strategy is to promote and foster eco-consciousness in relation to an environmentally sound and sustainable society based on smart partnership. The Strategy has identified a framework containing five actions, which are called action agendas. It is based on issues facing the Asia-Pacific region and examples of successful environmental education practices.

The Strategy seeks to give environmental education concrete direction by suggesting an integrated action plan for all agencies and organizations involved in environmental education, including business and industry, NGOs, media, and higher education systems. These four areas have been identified by the IGES/Research Project Plans as the key channels through which environmental education should be promoted in the region because of their special strengths, such as (1) the access of government to core budgets and its ability to introduce and initiate changes to policies and legislation without undue delay; (2) the ability of NGOs to work with the community and their capacity to change programs to reflect the desires of the community; (3) the capability of the media to widely disseminate information; and

(4) the ability of the private sector to develop industrial operations and generate resources.

The Strategy is consistent with international trends as well as the needs of the environmental education communities. For example, the U.N. Secretary-General, in the 6th Session of the Economic and Social Council Commission on Sustainable Development, highlighted the need to prepare a regional education strategy for the Asia-Pacific region.

The vision of the EE Project has been identified as "an active, better informed, capable, and responsible network of environmental educators, facilitators, and organizations, who actively work in their own community to achieve the goal of a sustainable society for the Asia-Pacific Region," whereas its mission statement states the goal "to provide leadership in promoting, inspiring, and fostering citizens to work towards achieving a sustainable future."

The beneficiaries include governments, schools, universities, private sectors, mass media, research organizations, donors, NGOs, professional groups, international organizations, inter-governmental agencies, and civil society in general, including any agencies and organizations concerned with improving the quality of human life through environmental education.

As already mentioned, the Strategy has identified a framework of actions called an action agenda. Each action agenda item is briefly described below.

i. Strengthen the capacity of stakeholders

Transferring knowledge, along with other essential processes, such as acquiring awareness, attitudes, skills, ethics, analytical ability, and capacity building are key to achieving an environmentally sound and sustainable society. Through education and training, people can change their knowledge, attitude, and behavior in a desirable way. Therefore, strengthening capacity is considered to be the driving force for enhancing environmental education. The enabling capacity of local people is initially dependent upon their institutional capacity, capability, and their active, responsible participation.

ii. Develop partnership for collaborative works

Every country in the region has its own specialties and strengths. These specialties can be directly shared through networking, collaborative works, and partnership. For this matter, partnerships based on mutuality and reciprocity are vitally important in a diverse region like the Asia-Pacific. In other words, a true partnership means working together towards a common goal. It also means taking comparative advantages into consideration, strengthening cooperation and synergy between countries, and securing the optimum benefits from minimum resource utilization. In sum, it can be said that its purpose is to bring regional strengths together.

iii. Improve the curriculum and program development

Environment is a broad term that goes beyond nature studies, and involves economic, political, social, and cultural dimensions. That is the reason why it must be addressed in a holistic framework. Environmental educators and facilitators should be able to facilitate the creation of a sustainable future in a dynamic and fast-changing world. Environmental education should be part of learning throughout life (or life-long learning). The curriculum and education programs should focus on methods of learning, as well as content. Environmental education organizations need to demonstrate the use of sustainable practices as an example in their everyday operations. It is for these reasons that we need to review and improve curriculum and program development periodically, both in structure (curriculum) as well as process (pedagogy), for all forms of education.

iv. Facilitate improved governance for environmental education

Improved governance in the context of environmental education means the management of common affairs in cooperation with concerned stakeholders, the establishment of social arrangements for sharing power, and responsible exercising of the decision-making process. Because of the multi-disciplinary and composite nature of environmental education, effective governance is vitally important in dealing with environmental education issues at all levels of the educational system. Actors and processes from the private sector as well as the public sector should be considered in dealing with those issues. Finally, environmental education should be approached in a holistic manner.

v. Mobilize external assistance

Environmental education is a priority area in the region. National governments have shown their commitment to environmental protection. However, many countries in the region are not in a position to adopt this policy due to lack of funding and resources. External support would assist their efforts. Therefore, it is important to explore the opportunities to mobilize external assistance and resources for enhancing environmental education, thereby enabling countries

to protect their environments by themselves.

1.5 Conclusion

The EE Project was successful in clarifying the status, problems, issues, and general directions of environmental education in the Asia-Pacific region through a three-year comprehensive assessment and sector-based research activities. The findings have already been presented in the main text above. In this section, we briefly outline the outcomes of the first phase of research of the IGES Environmental Education Project.

For many years, the international community has been calling for the implementation of environmental education to achieve the goal of environmental conservation. Recommendations arising from important meetings, "Agenda 21" from the United Nations Conterence on Environment and Development (Earth Summit) in 1992 and the Thessaloniki Declaration[6] in 1997, for example, have repeatedly appealed for stronger environmental education programs and activities. Based on those recommendations, which indicate a significant amount of international consensus, the EE Project began to conduct research on ways to promote and improve environmental education, focusing on the Asia-Pacific region.

This Project found that the necessity and importance of environmental education have already been recognized, and that related activities have been started throughout the Asia-Pacific region. In addition, business and industry, non-governmental organizations, the media, and higher education are all recognized as important actors in implementing environmental education in its broadest context. However, this comparative study found great differences in the design of environmental education systems in the region.

These differences are thought to be due to differences in culture and in political and economic systems. Nevertheless, it appears that transfer of environmental education system design and techniques to other countries is possible by rearranging and proposing appropriate policies or methods that have already proven successful elsewhere. It is impossible to conclude that specific systems or techniques used in developed countries are always appropriate in developing countries. The Project collected many cases of environmental education activities from the Asia-Pacific region that seemed to be successful. If these successes can be transferred to other countries, it seems possible to create new development patterns or the "leap-frogging" of environmental education in the Asia-Pacific region. Because grants and other funds must be used effectively, it is important that international cooperation relating to the environment and environmental education basically be concerned with technology transfers.

Taking these factors into consideration, the Project formulated the "Regional Strategy on Environmental Education in the Asia-Pacific" in cooperation with researchers, experts, and specialists from the region. Essentially, this strategy shows some directions as to how to organize and manage environmental education effectively. However, because this strategy is intended to be comprehensive enough to apply to the entire Asia-Pacific region, it might be considered too conceptual. Despite this, one must remember that this is only an initial attempt to define a strategy for the entire region, and it must be revised in the future to adapt to changing circumstances.

Our three years of research repeatedly confirmed the importance of networking between stakeholders in order to implement environmental education effectively. The basis of a network is partnership, and the concept of partnership in the field of environmental education was widely recognized in conferences, symposiums, and workshops organized by the Project. Partnership is cooperation between like-minded individuals, organizations, or institutions to achieve a common goal agreed upon by stakeholders on a mutual and reciprocal resource-sharing basis.

The EE Project has continued to foster environmental education networks of organizations, institutions, and individuals in the Asia-Pacific region through occasional meetings, such as the "Environmental Education Workshop for Overseas Assistance," the "International Conference on Environmental Education in the Asia-Pacific Region," and the "Regional Workshop on Environmental Education in the Asia-Pacific." These networks have the potential to develop into concrete schemes that can play vital roles in promoting environmental education effectively in the Asia-Pacific region.

The Project also successfully participated in international joint projects to promote better environmental education through evaluation of the Japan–U.S. Common Agenda Round Table-Indonesia Environmental Education Project, and positively supported the China, Korea, and the Japan Tripartite Environmental Education Network Project.

2. Self-evaluation of the Project

2.1 Originality

Conventional research on environmental education has concentrated on school education. The major

originality of the EE Project is its broad view of four main sectors for environmental education: business and industry, NGOs, the media, and school education. The preparation of status reports from thirty-four countries and two special areas is unique in the sense that it addresses the issues of promoting environmental education in the Asia-Pacific region through those four channels. Original reports, as well as abridged versions, serve as databases for environmental education. Also, a synthesized version is available for easy reference. This is the first effort of its kind to put information together in a single volume in the field of environmental education from so many countries in the region. The reports have helped deepen the understanding of issues and problems related to environmental education in the Asia-Pacific region.

2.2 Achievements

The research started with humble beginnings as an assessment of country needs in relation to environmental education and led to the formulation of a regional strategy. The strategy awaits formal endorsement and then will be ready to move ahead to actual implementation, based on principles of reciprocity in partnership with national agencies and organizations.

The EE Project, in partnership with UNEP, has been successful in motivating inter-governmental organizations (IGOs) and international NGOs to develop a sub-regional strategy on environmental education in the ASEAN region and South Asia. ASEAN has recently completed the formulation of the strategy, whereas SACEP is in the process of formulating an identical strategy for South Asia. The government of Japan also initiated the formation of the Tripartite (China–Japan–Korea) Environmental Education Network (TEEN) at the end of 2000, and it is expected to grow into an East Asia environmental education network in the future. These initiatives show that the Project has been, to some extent, successful in influencing policymaking processes at the regional level.

At this stage, the dissemination of our outputs has been limited to our partners, collaborators, and international organizations in the Asia-Pacific region. However, we have not been able to reach out to partners in other parts of the world. The comments received from the users of our outputs are quite satisfactory. While the outputs have taken into account previous works, they do not duplicate or make the previous works redundant. They also point out the need for integrated action “on the ground.” This is what the Project will focus on in its second phase of research.

It must be noted that the initial aims and objectives of the Project were broad and ambitious, and that work on each of the four sectors identified in the research was done rather independently. Because of the size of the research tasks, integration of research activities across the sectors was difficult to coordinate. This problem needs to be addressed in the future.

The Project made every effort to achieve the goals stated in the research plan. Researchers were required to develop their own annual performance targets in consultation with the Project Leader, with who they were constantly in touch. Frequent meetings of researchers were helpful in clarifying the issues of coordination and inter-personal relationships. Nevertheless, the researchers experienced problems in performing their duties and responsibilities smoothly. It is hoped that this kind of problem will be solved after the appointment of a full-time Project Manager in the second phase. Another problem is that the Project’s objectives were too broad and ambitious, with four thrust areas. In reality, it has been difficult to move in an integrated way between these sectors. In this regard, more of a team approach is required, not only in formulating goals and objectives, but also in determining the means of implementation.

2.3 Management

The Project has been successful in managing its activities in an interactive-cum-participatory way. For example, it has effectively brought regional strengths together through its four sectors of research, and has developed effective networking and partnership with many agencies and organizations in the region. It has been successful in procuring funds from Japanese organizations and in disseminating its outputs in the region in a limited way. Its negative aspects cannot be discussed without considering the context under which it was working, the inputs it received, the process it adopted, both in formulating the plan as well as implementation, and the type of outputs it produced. There was no integration of the four sectors in defining the problems of environmental education; there was no concrete action plan; there was no effort to develop institutional linkages with regional organizations, and so forth. In order to address these issues, the experiences of the first phase should be taken into consideration while managing the project in the second phase, especially incorporating innovation, team spirit, accountability, and synergy. Also, the Project needs to consider how to develop more effective linkages with other projects of IGES.

3. Summary of the evaluation

The summary of the evaluation is organized into two parts, internal evaluation by the members of the Research Advisory Committee (RAC) and external evaluators. The evaluation focused on four aspects: (a) appropriateness of the project plan, (b) project achievement, (c) project management, and (d) general evaluation of the first phase of the Project.

3.1 Evaluation by RAC members

IGES requested RAC members to evaluate outcomes of the first phase of strategic research work: Dr. Tongroj Onchan, Mekong Environment and Resource Institute (Thailand); Dr. Jyoti Parikh, Indira Gandhi Institute of Development Research (India); and Dr. Norhayati Mustapha, Institute of Strategic and International Studies (Malaysia). Their findings are briefly summarized below.

a. Project plan

Evaluators examined the appropriateness of the targets, research plan, and research methodology adopted by the EE Project. The evaluators were of the view that environmental education is key to addressing the perceived needs of people, developing an innovative environment strategy, realizing sustainable development, and ensuring people's active and informed participation in the region. Its target groups are wide and cover a broad range of actors, which makes it difficult to reach out to all actors. The research plan is comprehensive, goes beyond the walls of formal approach, begins with a preliminary review of overall status of environmental education, and then focuses on four key areas (media, business & industry, school education, and non-governmental organizations). The research methodology, the evaluators opine, is broad in scope but appropriate to reach out to various target groups. Its five-phased research plan is logically organized and pragmatic. It was suggested that an adequate and appropriate conceptual framework should be developed in order to conduct the policy research on environmental education. It was suggested that a comparative analysis between sub-regions would be an advantage.

b. Project achievements

The compilation of 36 status reports, by itself, is a major achievement of the Project, along with the formulation of a regional strategy, training of environmental educators and facilitators, and undertaking field studies in the region. The summary of environmental education activities and approaches in tabular form gives a picture of the overall status of education in the region. The report is ground-breaking, as it contains 36 status reports in a single volume. The idea of integrating four sectors to look at environmental education is commendable and useful for building a synergy among various actors. Some of its findings could be used for developing environmental education programs at national and regional levels, while others need to be further investigated. The successful examples of education can be easily disseminated for replication in other countries; however, the evaluators found that their integration has not been adequately addressed in the report. The five-action agenda suggested in the strategy needs to be tried out at various levels.

The Project has been successful in influencing policymakers, particularly in the tripartite environmental education network in Northeast Asia (China, Japan, Korea), a common agenda for roundtables, and in the development of a sub-regional strategy. The reports provide hands-on information to policymakers; however, an in-depth analysis of critical issues is required in order to convince policymakers about the gravity of the issue in question. The Project has made an impressive record of hosting workshops with greater participation of collaborators. The workshops are useful in sharing experiences and expertise among collaborators, securing their participation, and making them feel that something is going on in the region. The Project has shown effectiveness in reaching out to a large audience in a cost-saving way, such as networking, partnership, workshops, case studies, and collaborative works in the region.

c. Project management

The EE Project, despite its budgetary constraints and limited manpower, has been successful in undertaking a vast amount of work and bringing regional strengths together. The overall management and scheduling were satisfactory. However, the Project still lacks, and is in the process of making, a concrete plan on the integration of media, NGOs, schools, businesses, and industry, and in identifying their linkages with other organizations.

d. General evaluation

The evaluators generally agreed that the Project has made a good start by editing 36 status reports in a single volume and by formulating a comprehensive regional strategy on environmental education. Participatory techniques and collaborative partnership were used to prepare these documents. A thorough analysis of situations and available information was

undertaken to prepare the regional strategy. Due to the complexity of the problems, it is necessary to focus on critical issues and find their policy relevance in planning and implementation. Policymakers should be involved from the beginning of project planning.

3.2 Evaluation by outside experts

Environmental education is a force to bring a change in values and attitudes towards a more environmentally benign human–nature relationship. Its promotion is a must. The Project has been successful in providing an overall status report on environmental education in the Asia-Pacific region. It focused on information gathering, strategy development, and regional networking. It would have been interesting to see the work on the global development of environmental education, barriers to its implementation, and the role of culture and its influence. Although the Project is in operation in a region where almost 60 percent of the world's population lives, it would be interesting to undertake regional comparative studies and get a global perspective on environmental education.

4. Epilogue

The evaluation findings provide a very good insight on the successes and failures of activities, strengths, resource constraints, and weaknesses in the overall management of the EE Project. Its successes include the preparation of a status report covering 36 countries and special areas. Strengths include the use of participatory techniques and collaborative partnerships in the formulation of the status reports and regional strategy, given its limited manpower and budgetary constraints. The combination of four areas (NGOs, media, schools, and business and industry), because of their unique strengths in promoting environmental education, was given a high rating by both external as well as international reviewers.

On the other hand, the evaluators also pointed out that the Project has not shown how the four areas (sectors) could be combined and linked with other organizations. They also pointed out the fact that there is no thorough analysis and assessment of critical issues, which will be relevant to policymakers in the region. Other suggestions include that the survey did not cover primary and secondary schools; the target audience was too varied and wide; and that the action agenda in the regional strategy was broad.

Their suggestions also include that the Project should cover all forms of education—formal, informal, and non-formal. In the region, more training materials are needed to promote environmental education and raise public awareness. Efforts should be geared towards providing training to stakeholders, especially training for teachers, trainers, and facilitators. The evaluators also opine that the Project should carry out programs to develop a mechanism for addressing the requests of stakeholders and partners in the region.

The evaluations were encouraging and forward-looking for streamlining activities for the second phase—serving as a guideline for the Project. Taking into consideration the suggestions made by Board members, individually as well as collectively, both at the formal and informal meetings, and inputs from our collaborators and partners, the Project developed its second phase research plan (2001–2004). Now, the EE Project has streamlined its activities in developing materials for both promoting education, as well as raising public awareness, providing training to stakeholders, educators, and facilitators, and conducting action research on eco-tourism education in the region. It is hoped and believed that these activities will be successful in enhancing eco-consciousness in the region at all levels—local, national, sub-regional, and regional.

While implementing the project, many people from various background supported us and extended advice to us. Toward the end of the First Phase, I would like to express my deepest appreciation to all the people that supported the EE project for the past years.

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[1] Bhandari,.B., and O. Abe., ed. 2001. *Environmental Education in the Asia-Pacific Region, Status, Issues and Practices, a condensed version.* Japan: IGES. (ISBN: 4-88788-001-4)

[2] IGES Environmental Education Project. 2000. *Study of media and the environment*. IGES.

[3] Being environmental literate means that a person is both environmentally aware and active.

[4] IGES. 2001. *Report of the first phase strategic research, Environmental education*. IGES. p. 58.

[5] IGES Environmental Education Project. 2000. *Regional strategy on environmental education in the Asia-Pacific, Promoting eco-consciousness towards a sustainable society*. Japan: IGES.

[6] In the Thessaloniki Declaration, environmental education was given a re-definition of "education for environment and sustainability." Details can be found in the following document: UNESCO. 1997. *Final report, International Conference on Environment and Society: Education and public awareness for sustainability*, Thessaloniki, Greece. 8–12 December 1997, EPD-97/CONF.401/CLD.3.

Environmental Governance Project

Kazu KATO

Project Leader

1. Outline of the Project

1.1 Background

Environmental governance is about how societies deal with environmental problems. It is concerned with interactions among formal and informal institutions and actors within society. These interactions influence how environmental problems are identified and addressed.

Environmental governance structures in Asia are rapidly changing. At the domestic level, new environmental laws, programs, and institutions are being established. At the sub-regional and regional levels also, environmental networks and cooperation schemes are beginning to form. These rapidly changing governance structures are greatly influencing how environmental problems are addressed. It is thus critical to examine the nature of environmental governance in the region.

1.2 Goals and targets

The main objective of the Environmental Governance (EG) Project is to address and analyze major issues of environmental governance and to propose concrete policy recommendations relevant to the Asian region. The Project utilized a systematic approach to documenting information and carrying out its activities, and maintained strong links with the other IGES research areas. Through its research, the Environmental Governance Project has been expected to assist countries in the region in capacity building and promoting a participatory approach to environment and development.

More specifically, the EG Project examined in a systematic way what the relevant processes are and who the actors are that work to promote and support effective environmental governance in the Asian region, as well as how these have changed over time. Several national and sub-regional environmental governance systems were selected and examined in a cross-sectoral and comparative manner.

Areas to be examined with regard to national and sub-regional governance systems included how decisions are made; who makes them; how decisions are implemented; what kind of information is available and from what source; how processes are reviewed; how these are influenced by internal and external forces; how systems are evaluated; and if they can be adapted to respond to challenges.

1.3 Method and approach

The methodologies for conducting research and analysis employed by the respective components of the EG Project differ, but only slightly, depending on the specific objectives and circumstances of research activities carried out under that particular component, as summarized below.

a. Comparative study of national environmental governance

Based on analytical framework developed by Dr. Miranda Schreurs of the University of Maryland in the United States[1], country studies were conducted in collaboration with competent research institutes and researchers from the countries under study, utilizing a common methodology and protocol for analysis and comparison.

There are many important aspects of environmental governance. One aspect focused on in this study is that of agenda-setting and implementation by various actors, including international agencies and institutions. To put it simply, agenda-setting and implementation are both components of the policy process. How they work in a country is heavily dependent upon the structure of the government and the formal and informal institutions that dictate how actors relate to each other.

In order to understand and analyze the processes of agenda-setting and implementation in relation to the three issue areas of marine pollution, air pollution (acid rain and climate change), and deforestation, the following research protocol was adopted and followed: (1) broad introductory overview, (2) contextual overview, (3) current state of environmental governance mechanisms—a broad overview of actors and processes, and (4) case studies.

The case studies focused on agenda-setting and implementation processes as aspects of environmental governance in relationship to marine pollution, air pollution (acid rain and climate change), and

deforestation. The following questions were considered separately for both processes of agenda-setting and implementation.

With regard to agenda-setting, questions asked included: Who are the primary actors involved in getting each of the three environmental issues onto the agenda? How has the involvement of these actors in the agenda-setting process changed over time? What are the interests shaping the actors' perceptions of each of these environmental issues? Which policy options have received dominant attention, and why? What are the strengths and weaknesses of the agenda-setting process for each environmental issue?

With regard to implementation: Who are the primary actors involved in implementing government policies? How has the involvement of these actors in implementation changed over time? What are the interests of actors shaping how they perform in implementation? How effective has the implementation of policy been in addressing the environmental issue areas discussed above?

b. Regional and sub-regional programs for environmental cooperation

The research into programs and mechanisms of environmental cooperation was conducted for the three sub-regions of Asia: Southeast Asia, Northeast Asia, and South Asia. The study was to follow the lines of enquiry and analysis adopted for the comparative study of national governance systems, with appropriate application of the same approach to and methodology in analyzing the roles of various actors and the processes of agenda-setting, policymaking, and implementation[2].

More specifically, the following questions and issues were addressed and analyzed for each of the three major sub-regional environmental programs.

- Legislative history
- Goals and objectives
- Strategies and priority areas of action/cooperation
- Cross-sectoral integration with national policies
- Modality of cooperation
- Institutional structure
- Implementation, monitoring, and assessment
- Finance
- Achievements to date
- Evaluation of the overall effectiveness of cooperative programs

Various methodologies were employed, including not only literature surveys and research of official records of meetings and other documentation, but also field visits and interviews with policymakers and researchers. Also, research staff attended several sub-regional conferences/meetings and exchanged views with participants. Those conferences included expert group meetings, intergovernmental meetings of the Acid Deposition Monitoring Network in East Asia (EANET) and the Northeast Asian Conference on Environmental Cooperation (NEAC). The former has been playing an important role as a first step toward collective management of transboundary acid rain problems, and the latter, held annually, has served as a forum for the exchange of information and policy dialogue on various environmental issues among environmental authorities of national and local governments, international organizations, and non-governmental organizations (NGOs) in Northeast Asia.

c. Business and environmental governance

During the course of a mid-year review of the overall project on environmental governance, the need to focus on an important actor in governance systems was recognized, namely, the private sector. Thus a case study of corporate environmental governance in Japan was launched in September 1998, focusing on the experience of Japanese private enterprises in environmental governance, both within industry itself and for Japanese society as a whole. A small group, the "Study Group on Business and Environmental Governance," was formed, with its members participating on a voluntary basis from various sectors of business and industry in Japan. The group held regular (twice monthly) meetings to discuss each other's experiences and the role of private businesses in Japanese environmental governance. Their report, entitled "Business and Environmental Governance" (in English and Japanese), was compiled into a report in March 1999, and presented at a March 1999 workshop, which was open to the public. The Japanese version of the report was later published (cf., New Development Patterns Project).

1.4 Major findings

a. Comparative study of national environmental governance

i. Recent trends

Many countries in Asia began to put environmental problems on their policy agenda in the late 1960s and early 1970s. During this period, however, most environmental problems remained unsolved, because environmental laws, policies and institutions, often

modeled after or imported straight from industrialized countries, did not work satisfactorily for these countries with different natural conditions, historical and socio-cultural backgrounds, and political and economic systems, and at different stages of economic development. Therefore, later on, it became necessary for most Asian governments to review existing environmental policies. Consequently, environmental laws and policies were revised, reformed, and strengthened again in the 1990s, and many positive trends have since emerged.

Beginning in the late 1980s and early 1990s, the framework or umbrella laws for environmental policy enacted in the 1970s were revised or replaced by new laws in China, Indonesia, Malaysia, the Republic of Korea (South Korea), and Japan. Their main purpose was to strengthen the implementation and enforcement of environmental laws and policies, to adopt a wide range of new policy measures and instruments, and to respond to newly emerging global environmental issues, such as depletion of the ozone layer, climate change, and transboundary movements of hazardous wastes.

On the other hand, the Asian economic crisis starting in 1997 threw cold water on growing environmental awareness in Asian countries. For example, the Thai government cut its budget for environmental infrastructure in the wake of its currency crisis. Public attention in Indonesia focused on how to get out of the severe economic and political crisis. As a result, environmental issues were not addressed vigorously. There are indications, however, that some other economies in Asia were relatively unaffected by, or are already coming out of, the crisis situation. Even for those countries still in a critical condition, it remains to be seen how long-lasting an impact this condition will have on the generally continuing trend toward heightened awareness among policymakers as well as the public about the importance of environmental issues, and consequently about the need for improved environmental governance and promoting international cooperation at all levels and layers of governance.

It is now generally acknowledged that the mega-trend of globalization will not only continue but accelerate its pace in the twenty-first century, and that it can bring both positive and negative impacts on the world economy as well as on the state of the local, national, regional, and global environment. It can potentially lead to technological innovations and breakthroughs, radically improving the efficiency of energy and resource use, minimizing waste, and increasing the competitiveness of various sectors of the economy. It can also aggravate the widening gap between developed and developing countries, as well as between the rich and poor—the strong and weak segments within societies.

Ultimately, however, environmental governance belongs to the domain of public policy. The environment, both natural and man-made, is a common good entrusted to the present generation for safe keeping, to be passed on to future generations. Globalization of the economy or liberalization of international trade and investment in itself does not guarantee fair competition and may even aggravate the widening gap. The power of the marketplace must be harnessed by public interventions, that is, through environmental policies utilizing not only the conventional command-and-control type of regulatory measures, but also all manner of policy instruments and tools available to public authorities. Social and environmental safety nets can only be provided through public policies and institutions. Environmental policies must become truly public, involving all stakeholders and all segments of society.

ii. Major actors

(1) Central governments

Environmental policies were initiated by the central government in most of the Asian countries studied, except for Japan and India, where traditionally actors other than central governments such as local governments and environmental movements among citizens played a major role in introducing innovative policies and actions. So far, it can be said that central governments have played, and continue to play, a key role in environmental governance in Asian countries. Within the structure of central governments, however, environmental policy still tends to be separate or isolated from the mainstream policies of economic planning and industrial or agricultural development. In addition to the ministry of environment, many governmental ministries and agencies are responsible for environmental issues under their respective jurisdiction. As a consequence, the overlapping or duplication of policies and efforts can often be found in a number of policy domains related to environmental governance.

(2) Local governments

The functions of local governments are defined within the constitutional system in each country. In the Asian region, local governments in Japan and India have played comparatively greater roles in dealing with environmental problems. After democratization in the Philippines, South Korea, and Thailand, local governments began to pay more attention to environmental problems. It is worth noting here that the governors of major provinces and capital cities are elected by public vote in all of these countries.

(3) Environmental NGOs

A newly emerging environmental actor in Asian countries is the environmental NGO. The definition of environmental NGOs and the relationship between the government and environmental NGOs are different in each country. Once, environmental NGOs were not formally recognized, but rather regarded as strong opponents of government policies. Environmental NGOs themselves acted chiefly as watchdogs for government policies and institutions.

In the 1990s, the national governments of South Korea, Thailand, and Indonesia gave official status to environmental NGOs in their framework legislation. Under the Aquino administration, the constitution of the Philippines was amended, amongst other changes, to allow representatives of environmental NGOs to be involved in the various processes of governmental policy dialogue and decision-making. In contrast, due to political sensitivities and the low level of public awareness about environmental problems, few environmental NGOs existed in China, and organized civil protest movements against environmental problems have not yet emerged. The mass media in China, however, have begun to play an increasingly positive role in exposing cases of violation of environmental laws and regulations, providing environmental data and information to the public, and reporting on pollution episodes and accidents, thus exerting significant influence on business behavior and governmental decision-making.

(4) Industries

Most industrial enterprises in Asian countries have maintained passive attitudes toward environmental management. Large corporations that are well connected with various governmental sectors have planned and carried out many development projects, but have rarely returned their profits to local communities. Industries, particularly export-oriented industries, in South Korea and Thailand have been aware of the importance of environmental protection, largely due to international influence, and initiated voluntary activities for environmental management, such as obtaining the certification of the ISO 14000 series of standards for environmental management. Large enterprises in China are now required to establish environmental units or to designate executive officers responsible for environmental protection within each corporate structure.

The most serious problem in industrial sectors is non-compliance with environmental regulations by small and medium-sized enterprises (SMEs). Town and Village Enterprises (TVEs) in China are exempted from environmental monitoring requirements and pollution charges. Although factories and other industrial facilities are required by law to treat their waste on site in Thailand, the waste is, in most cases, released directly into water bodies without any treatment. A large number of small-scale industrial facilities, including unorganized and household units, are not adequately addressed in India's current pollution abatement policy.

b. Regional and sub-regional environmental cooperation

i. Northeast Asia

The Northeast Asian sub-region refers to China, Japan, South Korea, North Korea, Mongolia, the Russian Far East, and Chinese Taipei. There was not much cohesion between countries within this sub-region until the latter part of the 1980s, and the countries rarely cooperated on environmental issues, except for certain initiatives undertaken by countries on a bilateral basis. During the latter part of the 1980s, however, efforts began to be made to jointly deal with environmental problems associated with development through expanded programs of international cooperation. Agenda 21, adopted at the United Nations Conference on Environment and Development (Rio Summit) in 1992, triggered the growth of multilateral cooperation on environmental issues, resulting in the establishment of several sub-regional programs, plans, and regular conferences.

Among these initiatives, the Northeast Asian Subregional Programme of Environmental Cooperation (NEASPEC) played a central role as a comprehensive intergovernmental program. The program was created at the first meeting of Senior Officials on Environmental Cooperation in Northeast Asia in 1993, hosted by the United Nations Economic and Social Commission for Asia and the Pacific (UN/ESCAP). The motivating force behind NEASPEC was the government of South Korea.

Since 1993, senior officials have held meetings every year or two to decide on program activities, including project planning and implementation. The three priority areas identified by NEASPEC are energy and air pollution, ecosystem management, and capacity building. Several projects on energy and air pollution—training workshops, technology demonstration projects, and monitoring/data collection projects—have been identified and implemented with financial assistance from the Asian Development Bank (ADB). Although NEASPEC did not have its own financial mechanism until quite recently, relying exclusively on *ad hoc* project-based funding, the participating governments agreed in March 2000 to establish a core fund for NEASPEC.

The Northeast Asian Conference on Environmental Cooperation (NEAC), which also covers various environmental issues, is a forum for policy dialogue among officials of environmental ministries and agencies from China, Japan, South Korea, Mongolia, and Russia. Researchers, local government officials, and representatives of NGOs have also been invited to the conferences. NEAC conferences have been held annually since 1992, and have provided participants with opportunities to exchange information, share experiences, and discuss actions to be taken in the future. The conference itself does not create any project or program-oriented activities.

Other initiatives covering a wider geographical area have also been made. Among them is an effort made by the Asia-Pacific Economic Cooperation (APEC) forum. This forum was inaugurated in 1989, and includes eighteen countries and economies. The first Environmental Ministerial Meeting, held in 1994, developed an APEC Environmental Vision Statement. Following this statement and other declarations, APEC developed a three-pronged environmental work program, namely, (1) the integration of environmental and economic considerations into APEC working groups; (2) sustainable cities, clean technologies, and the marine environment; and (3) a long-term focus on food, energy, the environment, economic growth, and population.

Finally, the Environment Congress for Asia and Pacific (ECO ASIA) must be mentioned. ECO ASIA was initiated by the Environment Agency of Japan, with the objective of fostering policy dialogue and cooperation on environmental and developmental issues among environmental ministers of participating countries. While ECO ASIA was originally intended as an informal forum for information exchange and discussion between ministers, it has endorsed the ECO ASIA Long-term Perspective Project, aimed at identifying options for environmental policies that promote long-term sustainable development of the Asia-Pacific region. This project has identified major environmental issues confronting the region; examined their links with socio-economic issues; and forecasted the future social, economic, and environmental issues that may result from different regional development scenarios.

ii. Southeast Asia (ASEAN)

Southeast Asia, as referred to here, embraces the ten countries of the Association of Southeast Asian Nations (ASEAN). Southeast Asia has a longer history of sub-regional environmental cooperation than the other sub-regions of Asia. Since its establishment in 1967, ASEAN has emphasized “functional cooperation” between member states on science and technology, culture and information, social development, and the environment.

The beginning of collaborative efforts on the environment can be traced back to 1977, when the ASEAN Sub-regional Environment Programme (ASEP) was developed in collaboration with UNEP. ASEP I designated six priority areas and listed more than one hundred projects and activities. Thereafter, two similar programs were developed and implemented. In 1993, a new ASEAN Strategic Plan of Action on the Environment was agreed upon, consisting of ten strategic thrusts and twenty-seven supporting actions. In addition, the ASEAN Cooperation Plan on Transboundary Pollution was agreed to in 1995. In 2000, an Environmental Education and Training Action Plan was also developed, in collaboration with UNEP-ROAP (United Nations Environment Programme / Regional Office for Asia and the Pacific).

The organizational structure to support these plans consists of the ASEAN Senior Officials on the Environment (ASOEN) and its subsidiary working groups, the meeting of environmental ministers, and the ASEAN Secretariat. Ministerial meetings are held every three years to ensure the implementation of decisions made by the heads of government and to adopt action plans. ASOEN meets every year to review the implementation of the plans, and to provide operational policy guidance. The ASEAN Secretariat administers all those activities.

In addition to the plans mentioned above, more focused and intensive collaboration also started in the late 1990s. The haze experienced in Southeast Asia in 1997 resulted in the most serious challenge for the sub-region, particularly in Indonesia, Malaysia, Singapore, and Brunei Darussalam. Accordingly, a Haze Technical Task Force was set up in 1995, and the Regional Haze Action Plan was adopted by the ASOEN meeting in 1997 for the purpose of fighting land and forest fires. Major components of the Plan are to take preventive measures, to establish regional monitoring mechanisms, and to increase fire-fighting capacity. Furthermore, environment ministers from each country agreed to initiate the process of negotiating for an ASEAN Agreement on Transboundary Haze in 2000. ASEAN, in close collaboration with UNEP, has conducted a feasibility study on a comprehensive assessment of legal, institutional, and administrative arrangements, and has been drafting the agreement.

In parallel with these initiatives, the Hanoi Plan of Action, the first in a series of comprehensive long-term ideas adopted at the ASEAN Summit in 1998, identified fifteen activities for environmental protection and sustainable development to be undertaken, with emphasis on transboundary haze

control.

Aside from those non-binding plans and programs, ASEAN developed an Agreement on the Conservation of Nature and Natural Resources, which is ASEAN's only environmental treaty to date. The agreement was concluded and signed by foreign ministers from all six ASEAN countries in 1985. Of the six, Indonesia, the Philippines, and Thailand ratified it in 1986, while Brunei Darussalam, Malaysia, and Singapore have not. Consequently, the agreement has not come into force.

iii. South Asia

South Asia refers to seven countries—Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Although a number of bilateral agreements on environmental issues between South Asian countries had been reached, no multilateral initiatives existed until the early 1980s, when environmental ministers from eight countries adopted the South Asia Cooperative Environment Programme (SACEP) in 1982. Covering broad priority subject areas, implementation of this program was poor. This does not, however, negate the significance of SACEP, since it provided a solid basis and justification for member countries and collaborating international agencies to initiate cooperative projects focused on single issue areas identified by SACEP.

SACEP has the characteristics of a modest-sized regional environmental organization, consisting of three major organs: the Governing Council, the Consultative Committee, and the Secretariat. SACEP, as an organ, provided secretariat and administrative services for implementing its own programs, together with other environmental initiatives.

The South Asian Association for Regional Cooperation (SAARC), which seeks to accelerate the economic and social development of its seven member states, has also pursued regional cooperation on the environment. SAARC has been particularly concerned with transboundary and global environmental issues, such as natural disasters, climate change, and transboundary movement of hazardous wastes, and has developed an action plan.

In addition to these two major comprehensive initiatives, several plans focusing on single issues have been developed in South Asia. The launch of the Regional Seas Programme was called for by SACEP member states at UNEP's Governing Council in 1982, resulting in the "designation of the region as a part of UNEP's Programme" in 1983. The program involves the five marine states of South Asia-Bangladesh, India, the Maldives, Pakistan, and Sri Lanka. These countries adopted a South Asian Seas Action Plan at a meeting of plenipotentiaries, held in New Delhi in 1995. The Action Plan came into force in 1998. The SACEP Secretariat has been designated as the secretariat for implementing the plan.

With regard to air pollution, the Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia was agreed upon during the 7th SACEP Governing Council meeting in Maldives in April 1998. The declaration was signed by Bangladesh, Bhutan India, Iran, Maldives, Nepal, Pakistan, and Sri Lanka. The implementation plan for the Declaration consists of three phases, and Phase One—network establishment, baseline studies, and development of action plans at national and regional levels—was carried out between May 1998 and March 2000. An institutional arrangement to support the implementation of Phase One consists of UNEP Environmental Assessment Programme for Asia and the Pacific (UNEP/EAP-AP), the Stockholm Environment Institute (SEI), and SACEP. UNEP/EAP-AP has administered the implementation of the Declaration in collaboration with SACEP, and SEI has provided substantial technical support. SEI's contribution was a part of its Regional Air Pollution in Developing Countries Program, funded by the Swedish International Development Authority (SIDA).

c. Business and environmental governance

During the early stages of the development of environmental policies, especially during the 1960s and 1970s, Japanese industries were merely responding to government regulations and to mounting public pressure. Their efforts were further reinforced by energy price hikes triggered by the oil crises of the 1970s. With the advent of global environmental problems such as depletion of the ozone layer and the threat of global warming during the latter half of the 1980s, they became increasingly aware of corporate responsibilities as important players in global environmental governance. Japanese big businesses, especially those with global markets, began to take more proactive stances toward environmental issues. Now there is an observable trend toward attempts and initiatives to deal with environmental issues through voluntary commitments and self-governance, including acceptance of pollution prevention agreements, adoption of company environmental charters, submitting themselves to environmental audits, certification and observance of the ISO14000 series of environmental management standards, implementation of voluntary action plans, and the Responsible Care program of the chemical industry, etc., rather than simply complying with government regulations.

1.5 Conclusion

a. National environmental governance

i. Agenda-setting

Agenda-setting for environmental policies in Asian countries has depended largely on the central governments' initiatives. At first, the most influential factor in environmental agenda-setting was the pressure to raise awareness from the international community rather than domestic environmental movements or pollution damage. In fact, the 1972 UN Conference on the Human Environment (UNCHE) became a watershed for the governments of China, India, and the ASEAN member countries in developing their environmental policies. Afterwards, when each country went through a period of rapid economic growth, pollution incidents and degradation of the natural environment led to new policy responses.

The civil society actors, such as environmental NGOs and business corporations in Asian countries, have to some extent gained opportunities to participate in the policymaking process in the field of the environment. In the Philippines, South Korea, and Thailand, national councils or forums for building consensus on environmental policies have been organized, which are comprised of representatives from both public and private sectors.

ii. Policy instruments

Many Asian governments have introduced policy instruments such as environmental impact assessment (EIA) procedures and market-based instruments (MBIs), which had been adopted earlier in Western countries and worked effectively there. But rarely have Asian countries made innovative modifications or adjustments to the policy instruments introduced from other countries. These policy instruments have, in many cases, been transferred to Asian countries through international development assistance programs and projects with environmental components. However, it needs to be carefully examined whether the more advanced policy responses transferred from Western countries work in the same way under existing conditions in Asian countries. In Bangladesh, for example, EIA procedures are now being practiced in large-scale projects carried out by foreign companies, but are yet to be applied widely to domestic projects.

iii. Policy implementation

Even though the tempo of institutional development of environmental policies in Asian countries has been faster than that of their economic growth when compared to the past records of Western nations, the ineffectiveness of environmental policies and institutions has become a serious problem. Strong initiatives by central governments are often not reflected adequately in the ground-level realities of policy implementation, and have failed to address the root causes of priority environmental problems of a specific locality. In other words, the policymaking process in these cases does not provide for adequate channels of communication between governmental and private sectors. Therefore, business enterprises have had few incentives to respond to such environmental policies, and the public is not motivated to play an active part in the process of policy implementation.

Recently, some Asian governments began to plan and implement environmental programs jointly with various social actors; viz., Water Pollution Control in the Huaihe River Basin in China, the Samut Prakarn's Pollution Control Action Plan in Thailand, and the PROKASIH (clean river) programme in Indonesia. These new types of environmental programs are expected to be implemented successfully.

iv. Policy recommendations

Taking into consideration the summary of findings and conclusions of the country studies described above, the EG Project suggests the following preliminary ideas for improving the environmental governance systems in Asian countries.

- Establish a network of regional and sub-regional institutions to monitor and review the status of environmental policy development and implementation in Asian countries. Widely disseminate the information and data obtained through various channels, including mass media and the Internet.
- Undertake a comprehensive review of existing laws, policies, and institutions related to environmental management in both public and private sectors, with a view to identifying and removing any gaps or inconsistencies among them. Further integrate environmental considerations into economic and other sectoral development policies and processes, and thus consolidate the ground for an overall policy framework for building a sustainable society.
- Promote decentralization and devolution of powers to local governments in environmental policymaking and implementation, in particular by delegating more authority as well as resources and responsibilities for environmental protection to relatively larger units of local government.

- Expand the membership and participation of environmental NGOs and other civil society organizations in national and local legislative or other policymaking bodies, and involve representatives of affected local communities in the process of planning and implementation of regional/local development programs and projects.
- Explore the possibilities for applying the concept of strategic environmental assessment (SEA) and management (SEM) in the field, while ensuring that the existing procedures for environmental impact assessment (EIA) are actually followed and opportunities for public participation in EIA processes are enhanced and utilized.
- Give special consideration to bringing small firms and factories into compliance with environmental regulations, without imposing severe costs on them.

b. Regional and sub-regional environmental cooperation

The characteristic features of existing programs and mechanisms for environmental cooperation in the three sub-regions are summarized below.

i. Northeast Asia

Parallel institutions: Several institutions for environmental cooperation were established through different channels, including environmental ministries, official diplomatic channels, officers of environmental ministries and agencies, NGOs, and academics, but with little coordination between the various channels. Consequently, some initiatives contain material that is redundant.

Multi-layer structure: Geographical coverage of environmental cooperation initiatives ranges from global, wider-than-regional to sub-regional. Some multilateral initiatives target Northeast Asia, while some others target the whole region of East Asia or, even more broadly Asia and the Pacific. The evidence shows that South Korea tends to favor a focus on Northeast Asia, whereas Japan focuses on the broader region (East Asia) or the entire Asia-Pacific region.

Different membership: The status of participating countries differs from one initiative to another, depending on diplomatic relations between countries and on the international membership of the host organization.

Weak institutional/financial structure: Since most of the regional environmental initiatives have little organizational structure and weak financial foundations, cooperation has made only slow progress. In the absence of regional organizations that can administer regional environmental plans and programs, each initiative must start negotiations from scratch. Some initiatives have stagnated in terms of institutional and financial development.

ii. Southeast Asia

Well-established institutional structure: A number of environmental action plans and programs have been initiated by ASEAN, which has developed the expertise necessary for administering regional cooperation in various fields. ASEAN's well-designed organizational structure has been applied to the environmental field, resulting in ministerial meetings on issues related to environment and development, senior officials meetings, working groups on single issues, and an environmental unit in the ASEAN secretariat. There are strong affiliations between each component of the organizational structure. Accordingly, there has been little redundancy between environmental cooperation activities within ASEAN.

Weak financial structure: ASEAN is not strong financially, and has mostly relied on external financial support, provided mostly on a project-by-project basis, for implementing its environmental activities. This has led to failure in executing several project proposals that did not attract donors' attention.

iii. South Asia

Parallel institutions: The establishment of SACEP was a milestone for multilateral environmental cooperation in South Asia. A number of action plans and programs have been identified and implemented under SACEP. A parallel regional organization, established three years after the creation of SACEP, has also pursued regional cooperation on environmental issues. With no formal link between the two major institutions, there are certain redundancies between their activities. Some point out that this limits the ability of SACEP to mobilize resources and implement its own plans and programs.

Weak financial structure: Facing several critical problems, such as expanding populations, poverty, and an unsustainable use of natural resources, South Asia has problems in mobilizing sufficient financial resources for environmental protection. Funding comes from international organizations and bilateral donors, but only according to the donors' preferences. The amount of funding from within South Asia and other sources is insufficient to carry out all the planned environmental activities.

c. Business and environmental governance

The March 1999 workshop held a panel discussion on the topic of "applicability and transferability of [the] Japanese business sector's experiences to other countries of Asia." Some speakers emphasized the significance of drawing lessons from failure rather than success, indicating several examples. Also, it was pointed out that, in order to examine applicability and transferability, there is a need to consider not only policy instruments but also the complex background of particular social, economic, and other factors and systems within an integrated framework. Furthermore, with respect to pollution control investment, it was suggested that developing countries should make use of "late-comers' advantages."

d. Remaining issues for future research

Included among the findings of the country studies are some policy recommendations, such as strengthening institutions and/or legal provisions and the introduction of new policy instruments for improving the effectiveness of environmental governance, but most of these proposals require further in-depth analyses to determine their level of specificity, appropriateness, and feasibility under the prevailing conditions of each country or the region as a whole. As a consequence, the EG Project has not yet reached a stage where it can make such comprehensive assessments and specific policy recommendations with a reasonable degree of confidence. By pursuing further in-depth studies, it should lead to concrete and practical policy proposals suited to the specific needs and circumstances of each country or region.

The relationship between national capacities for environmental governance and the processes of globalization in general, and trade and investment in particular, political democratization, decentralization, and the ongoing revolution in information technology and biotechnology need to be studied further.

Financial and institutional (particularly secretariat) arrangements for the further development and strengthening of regional and sub-regional programs and mechanisms for environmental cooperation need to be pursued.

Policy Recommendations
for improving institutions for regional/subregional environmental cooperation

1. "Suggestions for the role of NEAC," 9th Northeast Asian Conference on Environmental Cooperation (NEAC), 26-28 July, 2000, Ulaanbaatar, Mongolia.

- De-emphasize the role of Japan (and of EAJ) as the predominant financier and promoter of bilateral environmental programmes and projects in the subregion.
- At the same time, more Japanese support should be directed towards subregional, multilateral programmes and mechanisms.
- We are very much encouraged by, and strongly support, the ROK's leadership and various initiatives (such as TEMM) in taking the subregional/mulitilateral approach to environmental cooperation in Northeast Asia.
- NEAC should become a truly open, transparent and comprehensive forum/process for promoting cooperation and partnership among environmental authorities (national and local governments), private sector businesses, civil society organizations (CSOs), and research/academic communities.
- But it should NEVER become a project-based or project implementation mechanism.

2. "Suggestions for the role of ECO ASIA," 8th International Workshop for ECO ASIA Long-Term perspective Project, 27-28 February, 2001, Tokyo, Japan

- Emphasize and maintain openness and flexibility as an informal forum for policy dialogue
- Enhance the sense of ownership by participating countries and de-emphasize the role of Japan
- Focus on regionally shared problems of environment and development
- Encourage taking up issues of common concern to each subregion
- Organize meetings on a rotational basis at least once in every subregion
- In implementing projects, utilize existing programs and mechanisms for subregional cooperation

2. Self-evaluation of the Project

2.1 Originality

a. National governance systems

While a number of studies have been conducted on environmental policies of national or local governments in Asia by individual researchers as well as international agencies (notably by the World Bank, ADB, OECD, and ESCAP), few of them are comprehensive enough to cover the various roles and functions performed by private businesses, NGOs, and civil society in environmental governance. The Environmental Governance Project is a rather rare, if not unique, example of strategic research, whereby an entire range of processes, actors, and institutions involved in environmental governance is treated as a system, and policy proposals have been developed to improve the design and operation of that system.

b. Regional environmental cooperation

In view of the fact that there was little precedent of similar studies before the project team undertook the comparative analysis, the findings and conclusions of the research project will be of assistance to policymakers in understanding the whole picture of regional/sub-regional environmental cooperation, and in considering future steps to be taken to strengthen such cooperative programs, mechanisms, and institutions.

2.2 Achievements

In each of the Asian countries studied under this project, the most up-to-date information was collected and analyzed, factors significantly affecting the effectiveness of environmental governance were identified, and suggestions and recommendations were made to improve the effectiveness of national environmental governance systems and structures.

In the case of the comparative study of regional and sub-regional programs for environmental cooperation in Asia, the main features distinguishing each of the programs were identified and analyzed from the perspective of international regime formation and theories of governance, applying various models and hypotheses based on the experience of European countries, and some proposals were made to strengthen and enhance the effectiveness of such cooperative mechanisms[3].

Environmental governance is precisely about influencing the processes of policymaking and implementation in both governmental (public) and non-governmental (private) sectors. Through its research, and by coming up with policy recommendations (albeit on a highly generalized level at this stage), the research findings of the EG Project will contribute to identifying some of the key factors and instruments in designing and building systems of environmental governance which are more transparent, fair and just, and more effective, by allowing all major stakeholders to participate, and by assisting countries in Asia to mobilize resources and instruments in the process of policymaking and implementation.

With regard to the comparative study of national environmental governance systems in Asia, the findings and outcomes of the four country studies (on China, India, Japan, and Thailand) were disseminated and discussed at an international workshop organized by IGES in March 1999. Later in the same year, country reports were prepared for five more countries in Asia namely, Bangladesh, Indonesia, Malaysia, the Philippines, and South Korea[4]. The results of these additional country studies, along with presentations made on some cross-sectoral issues such as “trade and environment” and “environmental security,” were discussed at an international symposium organized jointly by IGES and Sophia University in March 2000, in which more than 300 people participated, representing a wide cross-section of public as well as private sector organizations and individuals.

A summary report synthesizing the findings of nine country studies, as well as conclusions of the two international workshops and accompanying panel discussions, was prepared in time for the meeting of environmental ministers of the governments of the Asia-Pacific region at the ECO ASIA 2000 Congress and the UN/ESCAP Ministerial Conference on Environment and Development, both of which were held in Kitakyushu, Japan in August 2000[5].

With regard to the comparative study of regional and sub-regional environmental programs, a set of working papers have been developed and disseminated through several channels. A paper was presented at the International Workshop on the Long-term Prospective Project of ECO ASIA, held in February 2000, in which environmental experts and representatives of international agencies from the Asia-Pacific region participated[6]. (Part of the presentation was used as a background information document for the ESCAP Ministerial Conference on Environment and Development, 2000.) Another paper focusing on Northeast Asia was presented at a sub-regional forum for policy-dialogue, the Northeast Asian Conference on Environmental Cooperation (NEAC) held in Ulaanbaatar, Mongolia in July 2000[7]. A paper synthesizing the results of these studies was presented at the International Workshop on the Long-term Prospective Project of ECO ASIA on February 27–28, 2001[8]. In addition, a summary of research findings

was presented at a committee on international environmental cooperation organized under the aegis of the Environmental Agency (now the Ministry of Environment) of the Government of Japan[9]. Furthermore, the papers were compiled and published as a report, and was distributed to policymakers in both national governments and regional/international organizations together, as well as to researchers in environmental fields in Asia.[10]

The report of the Study Group on "Business and Environmental Governance: A Case Study of Japan" was presented at an international workshop in March 1999, which also discussed ways and means of transferring their experiences, lessons learned, and skills acquired in the process to other countries of Asia, and was highly appreciated by some 70 participants. The report came under heavy demand from various sources, and was re-edited for commercial publication (in Japanese) and published in 2000[11].

Furthermore, almost all of these reports and working papers, except for the individual country reports written by collaborating researchers, have now been posted on the IGES web site on the Internet.

2.3 Management

Given the limited resources available within IGES, both human and financial, the project may be said to have achieved its original aims and objectives relatively well and in good time, according to its original research program and subsequent work (implementation) plans. The admittedly modest results obtained are satisfactory as a product of the very first phase of development and application of both methodologies and tools necessary for an analysis of a very complex and cross-cutting issue like that of environmental governance, and for elaborating policy guidelines and recommendations.

Due largely to the absence of a full-time project manager or senior-level research staff who would be responsible for overseeing the project staff members working as a team, the EG Project has been hampered from its very start by a lack of effective planning and day-to-day management and of human resources to carry out the planned research activities.

However, through the dedicated efforts of the remaining research staff, the project was able to make considerable progress toward its original objectives and targets, and was actually quite successful in producing its expected outputs, particularly in terms of building a network of research institutes and researchers within and outside Asia working in the area of environmental governance.

On the other hand, as a result of this state of affairs in the project team, most of the research activities had to rely on outside resources, and the project was not able to achieve much in terms of conducting for itself the necessary analyses and assessments, and of generating information concerning the various environmental governance systems and institutions in Asia, and to come up with its own conclusions and specific policy proposals to address the most critical issues of environmental governance thus identified.

3. Summary of evaluation

3.1 Evaluation by RAC members

IGES asked members of the Research Advisory Committee (RAC) to evaluate the outcome of the First Phase Strategic Research Projects on the following four points: project plan, project achievements, project management, and general evaluation. The evaluators were Dr. Keith Bezanson, Institute of Development Studies (IDS), University of Sussex, UK; Dr. Koh Kheng-Lian, Asia-Pacific Centre for Environmental Law (APCEL), National University of Singapore; Ms. Wan Portiah Hamzah, Institute of Strategic and International Studies (ISIS), Malaysia; and Dr. Tsuneyuki Morita, National Institute for Environmental Studies (NIES), Japan. The results of their evaluation on each of the four points are summarized below.

a. Project plan

In general, the targets, research plan, and methods of the EG Project were well defined and formulated, reflecting the policy needs of the countries concerned. The Project was versatile enough and included other sub-components that have implications on environmental governance in the mid-course review. Some other elements of environmental governance in advancing sustainable development, however, should have been considered, such as problems of overlapping jurisdiction, the role of donors and international institutions, access to information, tools to ensure transparency and dissemination of information by the government, how to achieve political will, methods of compliance and enforcement, etc. Also, it would have been useful for all researchers and collaborators to have more opportunities to discuss the project design and protocol, as well as to consult with policymakers, as the case studies covered in the project were diverse.

One evaluator noted, however, that the targets were too ambitious in comparison with the available human resources, while another thought that the Project's research plan was essentially of an exploratory and iterative nature, and that it has produced some

important baseline data, but there were no hypotheses as such, and because of this, there was no specific or carefully targeted research. On the other hand, given the exploratory and iterative nature of the research, the research methods were entirely appropriate.

b. Project achievements

The surveys, case studies, and other project activities generated a great deal of information, data, and exchange of experiences for the purpose of the research. The EG Project was very efficient in getting the collaborators to participate in organizing a number of workshops and meetings. A critical problem with the EG Project, however, was the insufficiency of influence over policymaking processes. There were no concrete recommendations for improving environmental governance in Asia. The surveys and brainstorming exercises produced an important and worthwhile baseline for further analysis, but this does not qualify as "originality."

However, all targets set up by the EG Project appeared to have been met. Despite some problems with project management, a good deal of work was accomplished and the project was completed within both its budget and assigned timeframe. Dissemination of research results also appears to have been adequate, but its effectiveness will depend on systematic follow-up, on tailoring products differentially to the needs of individual audiences, and on preparing special policy briefs based on feedback. Developing the network or creating links with other institutions will also enhance dissemination.

c. Project management

In spite of resource constraints, the overall project management appears to have been highly effective in providing outputs on time and within budget. Scheduling was well considered and appropriate.

d. General evaluation

The EG Project produced a number of important achievements in assembling a new and important baseline of essential information and data, including the results of country case studies. It also revealed interesting governance culture, which needs to be looked into, especially when cross-sectoral issues such as environmental security and trade measures are being considered. However, there was little in the way of in-depth analysis of trends, issues, contradictions, conflicts, policy space, and alternative institutional arrangements for improving environmental governance. These additional analyses would be needed for the project to have met fully its own stated goal of analyzing the major issues in environmental governance. (In this regard, the sub-component of the project on regional and sub-regional environmental cooperation yielded excellent results.)

Thus, the project targets were achieved, although perhaps more time should have been given to make a more detailed analysis. On the other hand, it is generally agreed that the overall purpose of this project was overly ambitious. It would have been wise to set a narrower and more focused purpose.

3.2 Evaluation by outside experts

Outside experts in various sectors, such as policymakers in national governments, international organizations, universities and other research institutions, environmental NGOs, and media from all parts of the world, were asked to give their comments on the achievements of the EG project.

Most of the experts who commented on it agreed on the importance and appropriateness of environmental governance as a subject of strategic research by IGES, and to many it was a priority area of concern and of particular relevance to developing countries and sustainable development. It was considered strong and timely too, because the issue of environmental governance will be a major theme during the World Summit on Sustainable Development (WSSD), to be held in Johannesburg in 2002. Some others thought the theme was too broad as a research project, and needed a much sharper focus and originality of approach. They also pointed out that the past activities of the EG Project have not contributed sufficiently to the international community by making concrete and practical proposals for improving environmental governance, particularly at the global level (notwithstanding the fact that this was beyond the scope of the EG project during its first phase). Its long-term value will depend on how the research results can be drawn together within a set of policy recommendations.

4. Epilogue

The results of the evaluation by RAC members and outside experts are persuasive, and to the point, and are all well taken, although sometimes their views may differ on points of detail. Considering the extreme diversity of the Asian region, a more focused approach to analyzing the specific conditions—political, economic, social, and ecological—of each country or sub-region under study would be needed to yield any useful results and to be able to make concrete and practical policy recommendations.

At the same time, it must be recognized that the EG Project in its first phase was intended to be exploratory and iterative, as one RAC member noted in his evaluation. Environmental governance at all levels—from local and national to international, regional, and global—is indeed of critical importance in the coming years and decades in achieving sustainable development. Because of the nature of the issue itself, however, it would take a long and continuous process of efforts and actions by all stakeholders to improve environmental governance at relevant levels.

During the process of internal review of the first phase projects and of planning for the second phase, all these points were considered, and, as a result, a new project on Long Term Perspective and Policy Integration (LTP) was formulated, integrating the EG Project with the New Development Patterns (NDP) Project. The purpose of this new project is to conduct long-term and cross-cutting research into ways and means of achieving sustainable development in the Asia-Pacific region, in close consultation and collaboration with other IGES projects. The outputs will be put forward as policy recommendations at high-level international meetings on sustainable development of the region.

The new project has taken over the research network on environmental issues in Asia developed by the EG Project during its first phase. In order to enhance its capacity for project management, a number of senior government officials, as well as several young researchers, have been recruited for the new project as full-time research staff. The results of evaluation and valuable comments made by RAC members and outside experts will be reflected in the research activities of the new project during its second phase.

During the three-year period, we were supported by people from various background, including IGES Board members. I would like to express my sincere appreciation to all those who kindly and generously extended their advice and assistance to our project.

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New Development Patterns Project

Kazuo MATSUSHITA

Project Leader

1. Outline of the Project

1.1 Background

Economic growth after World War II was made possible through 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 the 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 developing countries in Asia, 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.

The new development patterns that IGES are seeking have a global perspective, but focus particularly on Asia and the Pacific region. 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 that these changes will bring. In contrast to the overemphasis on the 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.

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

The New Development Patterns (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.

1.2 Goal and targets

The aim of the NDP Project is to explore new patterns of development, 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 of new development patterns

In the process of clarifying and identifying various issues relevant to the concept of New Development Patterns, experts pointed out the following issues and questions during the study 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?
- How should we consider national interests, enterprise interests, global interests, and human interests within 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 direction?

With the above points in mind, the issue papers on new development patterns were compiled and edited in a book called *Environment in the 21st Century and New Development Patterns*, published by Chuo Hoki Publishing Co., Ltd. in November 1999 in Japanese, and by Kluwer Academic Publishers in English in December 2000.

Along with 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. 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 in a booklet describing practical examples of technology transfer and cooperation.[1]

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 the Environment Congress for Asia and the Pacific (ECO ASIA), 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 policymaking 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 2000 in Kitakyushu City, Japan).

IGES prepared documents entitled "Policy Implications in Addressing Critical Environment and Sustainable Development Issues of the Region"[2] and "Specific Issues on Sustainable Development in Asia

and the Pacific,"[3] which were submitted to the Preparatory Meeting of Senior Officials of ESCAP/MCED for information and discussion, and then reported to the ESCAP/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.

d. Business and environmental governance

The business sector, 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, concluding pollution control agreements with local governments, and 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 has taken 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 policymaking 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*.[4] The Project also conducted studies 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."

e. Information technology and environment

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?

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, 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 Asia-Pacific nations.

1.3 Method and approach

a. Issues of new development patterns

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 these issues in fiscal year (FY) 1998. Following the discussions in the sessions mentioned above, members from the group, as well as some IGES Board members, 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 compiled in a book called *Environment in the 21st Century and New Development Patterns*, 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.

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 the development and transfer of technology.

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

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.

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 the United Nation Economic and Social Commission for Asia and the Pacific). Thus, in the process of 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 annual international workshops of ECO ASIA and the ESCAP Regional Review Meeting were identified as opportunities 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 Figure 1 below.

d. Issues for the G8 Environment Ministers' Meeting

The World Summit for Sustainable Development, scheduled for 2002 will conduct a comprehensive review on the implementation of Agenda 21 ten years after the first Earth Summit in 1992 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 Ministers' 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. Our research outcome was published as "Important Issues Related to Environment and Development: Toward Rio +10" (available in Japanese only).

e. Business and environmental governance

<u>Publishing "Business and Environmental Governance"</u>

IGES's Environmental Governance Project 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. The results of the study group were compiled and made public at the international workshop "Business and Environmental Governance," held 19 March 1999.

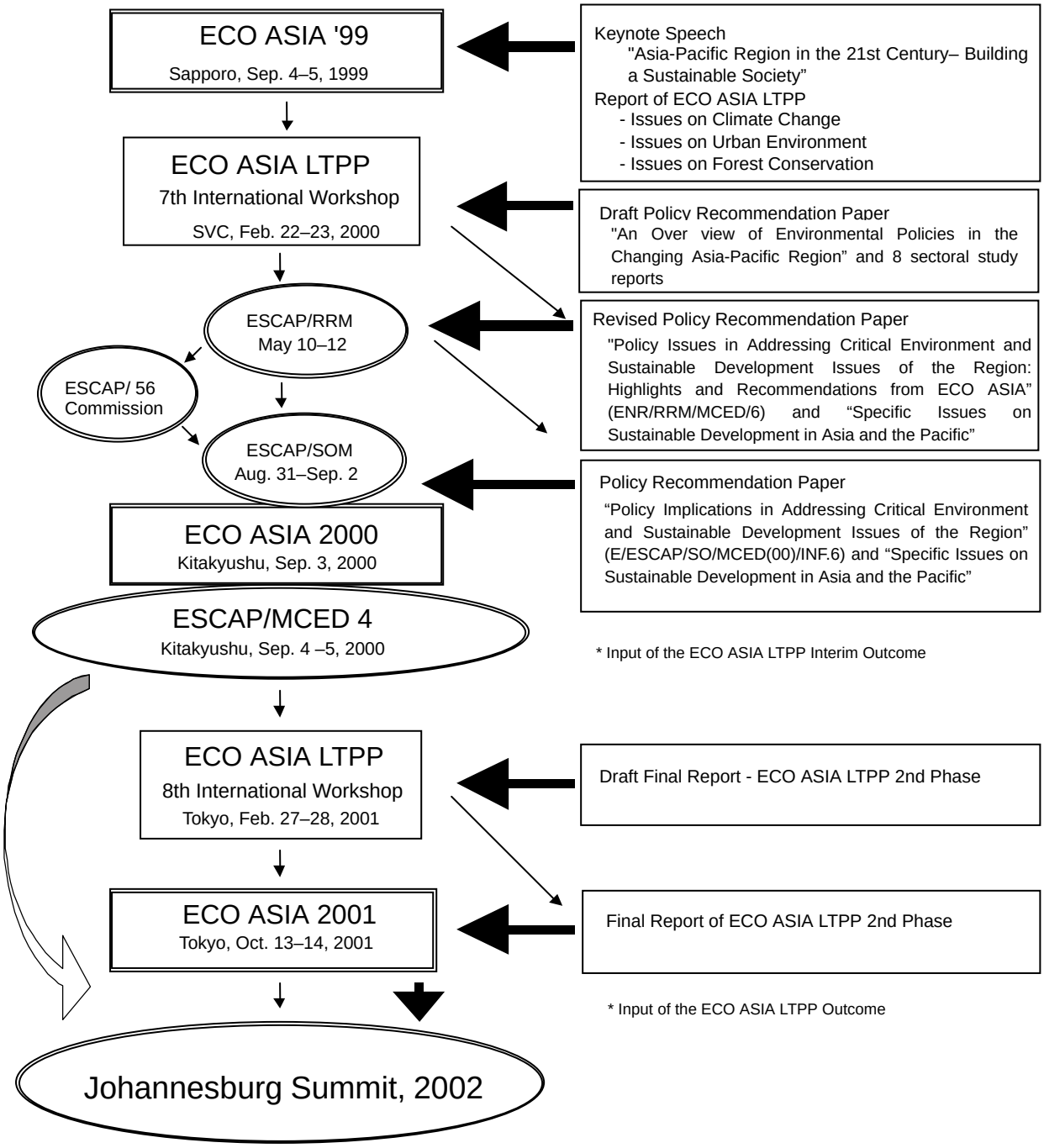

Figure 1. IGES inputs to international policy dialogue.

Notes: LTPP = Long Term Perspective Project
RRM = Regional Review Meeting
SOM = Senior Officials Meeting

The NDP Project took over this work from the Environmental Governance Project and, in October 1999, study group meetings were resumed in order to conduct serious discussions on each report. In October 2000, the book, *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. The following approach was taken. Established study group meetings, consisting of business people working in the environmental sector, discussed and reported on pollution control and environment by the members, and evaluated corporate environmental activity from the perspective of environmental governance.

f. Information technology (IT) and the 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 the environmental implications of the digital economy and a policy framework that can support industry's efforts to address global warming.[5] Thirty participants attended the workshop from the IT industry, the 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 (COP-6).

In December 2000, the NDP Project set up a study group on IT and the environment with Nikkei BP Eco Management Forum. This study group consisted 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.

1.4 Major findings

a. Issues of new development patterns

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

- 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

- 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

- 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

b. Transfer of environmentally sound technology

i. 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 that meet the following criteria:

(1) GDP per capita of U.S.$699 or less

(2) Manufacturing accounts for 10 percent or less of GDP

(3) Adult literacy is 20 percent or less

ii. 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 that 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.

iii. Difficulties in addressing environmental problems

Among developing countries, LLDCs face particular difficulties in 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.

iv. Purpose and key factors of technology transfer and cooperation

In the study, the focus is on technology transfer and cooperation for the LLDCs 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., the European and 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 a 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 cultures, 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.

c. ECO ASIA, ESCAP/MCED

i. ECO ASIA '99 (4–5 September in Sapporo, Japan)

Mr. Kazuo Matsushita made a keynote speech, "Asia-Pacific Region in the 21st Century: Building a Sustainable Society," at ECO ASIA '99.

ii. 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

(1) 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.

(2) 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 cycle of population growth, poverty, and environmental degradation, these issues must be addressed as interrelated problems.

(3) 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 Asia-Pacific Integrated Model (AIM) 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 by 2025.

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 the world's top 20 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. Between 1990 and 1995, 3.26 million hectares of forests were lost each year. The total forest area lost during this period (16.3 million hectares) is equivalent to almost half (43%) the size of Japan (37.6 million hectares).

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 the 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.

d. Issues for the G8 Environment Ministers' Meeting

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

Poverty and environment

(1) Assistance to less developed countries

ⅰ. Comprehensive and long-term perspective on assistance to less developed countries

ⅱ. Examination of technology transfer

ⅲ. Focus on Least among Less Developed Countries

iv. Ensuring fund amounts and qualitative enhancement of programs

(2) World Trade Organization (WTO)

ⅰ. Re-examination of trade rules

(3) Private investment

ⅰ. Utilization of private funds and human resources

(4) Population issue

ⅰ. Population increase in LDCs

(5) Commission on Sustainable Development (CSD) and Agenda 21

ⅰ. Enhancement of the Review Process of the Implementation of Agenda 21 by the CSD

(6) Realization of the Köln Debt Initiative[6]

ⅰ. Follow-up of the Köln Debt Initiative on debt relief

(7) Partnership

ⅰ. Participation in decision-making processes by various sectors

Resource recycling-oriented society

(1) Improvement in resource management

ⅰ. Minimization/recycling of waste

ⅱ. Promotion of renewable energy development

ⅲ. Efficient use

(2) Change of consumption/production patterns

ⅰ. Change of industrial structure

ⅱ. Change in consumers

ⅲ. Change of producers

(3) Government initiatives

ⅰ. Institutional incentives

ⅱ. Information

ⅲ. Accountability

Freshwater

(1) Determining the current status of freshwater resources

(2) Promoting assessment of international freshwater resources

(3) Increasing international assistance and enhancing coordination facilities among donor countries and institutions for freshwater resources

(4) Conservation of freshwater resources

(5) Promoting LDC actions by enhancement of capacity building, technology transfer, and international fund increases

Forests

(1) International forest conservation regime after IFF (**Intergovernmental Forum on Forests)**

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

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

(4) Assisting developing countries

The global commons[7] and United Nations reform

(1) Enhancement of UN functions relating to the environment

(2) The global commons

(3) Coordination of environmental treaties

Environment and security

(1) Concepts of environment and security

(2) Application of environment and security concept

(3) Relevance with the global commons and United Nations reform

International financial institutions and environment

(1) Deadline for settling common environmental guidelines

(2) Criteria for common environmental guidelines

(3) Individual actions for setting environmental guidelines

e. Business and environmental governance

Publishing "Business and Environmental Governance "

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 past efforts of and future tasks for the chemical industry to cope with various environmental problems that occurred from handling chemicals, which were the 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 in chapters 1 to 5, many Japanese companies have reached a certain level 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 the 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 the book by 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 co-exist.

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

f. Information technology and the environment

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 to a little less than 0.3 percent of the total German CO_2 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 greenhouse gas emissions caused by its use. 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 eco-labeling certification process takes too long to keep up with 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.

1.5 Conclusion

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.

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 required.

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 the NDP Project, 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.

2. Self-evaluation of the Project

2.1 Originality and achievements

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 with the public-at-large. Public forums on the issue also helped this process.

The report of the commissioned study, "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 policymakers 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.

Our inputs into ECO ASIA '99 and the keynote speech 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, the regional preparatory meeting of ESCAP/MCED held in Bangkok in May 2000, the Senior Officials Meeting of ESCAP/MCED, ESCAP/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 ESCAP/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 Johannesburg Summit 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 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 the 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 (COP-6) in The Hague, the Netherlands.

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

The NDP Project convened various outreach activities, including public forums on the "Transfer of Environmentally Sound Technology," the "Japan-U.S. Forum on Environmental Issues," "The Environment in the 21st Century and New Development Patterns," and "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 identified possibilities for future collaboration.

In its implementation of research activities, the NDP Project has various difficulties to face.

First, it had to define its targets, research plan, methodologies, etc, after other projects 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 the 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 it has strong cross-cutting characteristics. 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 the 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 policymakers. This is one of the important functions of policy-oriented research institutes like IGES; ECO ASIA, ESCAP/MCED, the G8 Environment Ministers' Meeting, and study on the transfer of environmentally sound technologies are among the examples. These were challenging tasks. However, it turned out to be very good opportunity to put forward IGES' ideas or research results into policy consideration and discussion by high-level policymakers.

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, 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 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.

2.2 Management

Evaluation of management of the NDP Project

In FY 1998, the NDP Project was initiated in July with only one senior research fellow (Glen Paoletto), and 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 have 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.

Economic efficiency of NDP 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 publication of project output 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, "Business and Environment," was conducted with the participation of experts from leading Japanese private companies. These experts made substantial contributions voluntarily.

3. Summary of the evaluation

3.1 Evaluation by RAC members

The New Development Patterns Project received evaluation on its first phase output from three members of the Research Advisory Committee (RAC), namely, Dr. Chia Lin Sien of the Institute of Southeast Asian Studies (ISEAS), Dr. Chalongphob Sussangkarn of the Thailand Development Research Institute Foundation (TDRI), and Ms. Wan Portiah Hamzah

(for Mr. Philip Mathews) of the Institute of Strategic and International Studies (ISIS). The evaluation was made on four categories.

The first evaluation category was on the planning of the Project. The Project's issues and the targets were evaluated as appropriate and timely, as they respond to the overall needs of the Asia-Pacific region. However, the evaluation varied for the research plan, method, and approach. The publication of "Environment in the 21st Century and New Development Patterns" was appreciated as a first step of the output, as well as the contribution to the Environmental Congress for Asia and the Pacific (ECO ASIA) and ESCAP/MCED, and studies on the sub-themes titled "Transfer of Environmentally Sound Technology" and "Business and Environmental Governance." On the other hand, it was pointed out that the concept of "new development patterns" is not entirely clear and that the analyses based on macroeconomics and uniform quantitative methods are lacking. With regard to "Business and Environmental Governance," it was pointed out that the examples used are all from Japan and some evaluators had doubts about the extent to which they can be applied to other countries in the Asia-Pacific region.

The second category related to the project outcomes. Although there was a positive appraisal on the Project's output, considering the limitation of time and staffing, the common view was that there needed to be more focus, since the initial target was too ambitious. There was also advice that not only ESCAP and ECO ASIA but also APEC and ASEAN should be utilized as forums for international policy consultation, and that there needs to be further collaboration with other countries. The sub-themes received recognition as the first stage of the output, but they also require further study.

The third category related to project administration and management. In this regard, it was evaluated as efficient and appropriate, considering the limited manpower compared to the imposing target.

The fourth category related to the overall project evaluation. According to the evaluators, the Project was satisfactory as a start in the first phase, but in order to achieve the project objectives, it was recommended that activities be more concentrated and human resources be reinforced. It was also pointed out that the Project's target and the scope should be focused on more feasible project work and that collaboration with researchers, policymakers, and institutions abroad should be enhanced, in order to rectify the tendency of the studies to focus too much on Japanese cases.

In addition to the above four items, evaluations were made on the overall implementation of IGES's first phase strategic research plan and on planning for the second phase of strategic research. Although the overall activities were highly evaluated, such as contributions to ECO ASIA, evaluators expressed some concern that IGES is expanding its activities too much. Also, the project methodologies and approaches need to be re-considered. With these points in mind, the Long-Term Perspective and Policy Integration Project, which will be established in the second phase, is receiving high expectations.

3.2 Evaluation by outside experts

A diverse range of outside experts have given comments on the NDP Project outcomes—policymakers from governments and international organizations, and experts from research institutions including universities, environmental NGOs, media, and other diverse fields.

Most evaluated the theme of the NDP Project as important and appropriate. They recognized that the Project has addressed important issues that should be taken up at the Johannesburg Summit (World Summit on Sustainable Development) in 2002. They highly appreciated the Project's timely publication of the study outcomes, the organizing of seminars and workshops, and the regular involvement in ECO ASIA and ESCAP/MCED through keynote presentations and reporting.

However, since the themes addressed by the NDP Project are broad and ambitious, there is a need for a tighter focus, more originality in the methodology, and more collaboration with researchers and institutions abroad, with more case studies and country studies. This advice has important implications for the second phase of strategic research projects. In any case, the expectations around the themes that the NDP Project tried to tackle are high, and further development is hoped for in the second phase and beyond.

4. Epilogue

The NDP Project was started later than the other IGES strategic projects. It aimed to study a cross-cutting, wide range of issues. The reality is that the Project started off without adequate preparation, along with the pressure of huge expectations, and the progress it made during its first phase was achieved through trial and error. I would like to take this opportunity to express our sincere thanks to all who supported the NDP Project activities.

The members of the Research Advisory Committee and external evaluators have recognized this situation and have provided important and insightful comments.

We would like to respond to those thought-provoking suggestions by utilizing them in our future research activities.

In the second research phase, the NDP Project will be integrated with the Environmental Governance (EG) Project, to make a new start as the Long-Term Perspective and Policy Integration (LTP) Project. The new project will collaborate closely with other IGES projects to study the measures and methods for realizing sustainable development in the Asia-Pacific region, with a long-term perspective and cross-cutting approach in making policy recommendations. Fortunately, the number of research staff is to be increased greatly. The real value of IGES will be judged on the activities from now on, and we will all strive our utmost to achieve success.

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[1] "Practical Examples of Technology Transfer and Cooperation ~ Toward Environmental Protection and Sustainable Development in Developing Countries" (FY1998 Project commissioned by the Environment Agency of Japan) is available in English. A copy can be obtained from the Long-Term Perspective and Policy Integration Project at IGES.

[2] "Policy Implications in Addressing Critical Environment and Sustainable Development Issues of the Region" (E/ESCAP/SO/MCED(00)/INF.6), Institute for Global Environmental Strategies, August 2000.

[3] "Specific Issues on Sustainable Development in Asia and the Pacific" (background information for the E/ESCAP/SO/MCED(00)/INF.6), Institute for Global Environmental Strategies, August 2000.

[4] Institute for Global Environmental Strategies (Ed.), *Minkan Kigyo to Kankyo Gababansu* (Business and Environmental Governance), Chuo Hoki Publishing Co., Ltd, 2000 (in Japanese).

[5] Workshop report is available in English. (Langrock, T., H. E. Ott, and T. Takeuchi, eds. 2001. "International Climate Policy & the IT-Sector: A report on the 'Second policy dialogue between Japan and Germany for facilitating co-ordinated measures to address global warming.' Wuppertal Institute for Climate, Environment, and Energy / Institute for Global Environmental Strategies.) PDF files are available at http://www.iges.or.jp/jg/igE.htm.

[6] Köln Debt Initiative was agreed by G7 member countries at the June 1999 Summit as a part of the debt-relief initiatives for the heavily indebted poor countries (HIPC). The G7 members called for debt-relief plans including full cancellation of the Official Development Assistance (ODA) debt.

[7] "Global commons" refers to the common resources beyond the sovereignty of the states, such as the atmosphere, oceans, and outer space. The term is sometimes also used to mean the institutional arrangement to manage these resources.

Capacity Building Program

Glen PAOLETTO

Program Manager

1. Outline of the Program

1.1 Background

A clear need exists for capacity building, as well as learning and training programs, relating to sustainable development and the environment in the Asia-Pacific region. The demand for capacity building is high, but common problems are faced by international and training organizations, including lack of personnel and funds to implement effective educational and training programs on a consistent, planned basis.

Since June 1999, the IGES Capacity Building (CB) Program either organized or participated in six training workshops, where it was found that competition for funding to organize face-to-face workshops is severe. Using feedback from both participants and instructors, work began on investigating the possibility of adopting innovative approaches to capacity building that could

- answer IGES' needs and make an impact,
- leverage resources and reduce costs, and
- respond to the needs of the government, international, and national organizations.

The Internet was an obvious way to look to for future directions and inputs. Investigations into the market regarding existing eLearning (online learning system) technologies found serious deficiencies in those technologies from IGES' perspective. IGES' needs could not be sufficiently met. Deficiencies include:

- slow download times,
- high cost,
- high maintenance,
- complex authoring environments, and
- difficult or inflexible programming issues.
- Further, IGES would have less control over language (a major difficulty).

During that time, efforts were made to begin the design of software and capacity building systems that met IGES' and specific market needs.

In January 2000, IGES contracted expert assistance in Japan to further investigate the feasibility of eLearning and Internet-based applications for learning and capacity building in Japan and abroad.

After six months of market surveys, interviews, and other fact-finding approaches, results show that the total market in Japan for eLearning applications could exceed U.S.$300 million in the next three years, taking into account:

- the still relatively limited access and integration of the Internet in Japan as a whole;
- future growth scenarios; and
- segments of the U.S. experience and learning processes.

During this phase, over 30 organizations were approached for input and opinions concerning Internet-based learning systems, and these inputs were used to provide feedback into the design processes.

1.2 Objectives and targets

a. Objectives and targets

"To support learning and capacity building for environment and sustainable development, utilizing eLearning systems as a primary means of implementation. The Program will focus on the Asia-Pacific region, while providing eLearning tools to those who wish to use and apply them.

b. Who needs capacity building?

As mentioned above, a series of needs assessment interviews and informal surveys with inputs from well over 100 people were undertaken by the CB Program over a period of six months. The CB Program also had close communication with the IGES Environmental Education (EE) Project activities to better assess the needs of EE in the Asia-Pacific region.

To begin with, the following can be highlighted as summary points, resulting from the CB Program's efforts to better assess needs in capacity building in the Asia-Pacific region.

- Three target groups identified during the interviews were
  - Government officials
  - Corporate managers

- Learning organizations and experts

- Given limited resources, capacity building should focus on policymakers and community leaders, because they are most likely to participate and leverage any effect.
- Environmental groups are often overextended and cannot cover all the issues that merit their attention.
- If the public is educated about the issues, leaders will emerge.
- In addition, it was seen that leaders can develop special interests, and gaps can develop between leaders and members of the general public.
- Capacity building efforts should be broadened to reach non-environmental groups, including civic associations, anti-poverty groups, community development groups, and chambers of commerce. If given the tools, these groups may participate in IGES activities, thereby broadening the base of interest in those activities.

Thus, there were strong voices supporting capacity building targeted at policymakers, community leaders, and the general public.

2. Method and approach

For much of the last ten years, higher learning organizations and institutions have made an effort to keep pace with rapid changes in information technology. The explosive growth of the World Wide Web has made it obvious to most that networked technologies will play an increasingly significant role in teaching, learning, and capacity building. However, the precise nature or form of this role is not clear. Early efforts have often been based on targeting those who are eager and willing to teach themselves how to use and implement new technologies.

Overall, however, this has proven to be an inappropriate strategy for promoting capacity building transformation. As the World Wide Web has pushed technology into the educational and training mainstream, early adopters have been replaced by pragmatists, who are both wary and looking for easy ways to bring technology into their work and teaching, but are unwilling to match the goal with time commitment. These people represent the mainstream of the work force related to capacity building, and are willing to use technology only when it can be shown beyond doubt that doing so will add value to their outputs without significantly reducing committed time.

To this end—developing systems so that they have practical effect—innovative systems, software, and courses have been launched by the CB Program. Once the CB Program Web sites were quietly launched, the program both approached and brought together specialists, government officials, and technologists to work on ways to incorporate information technology into course plans, capacity building projects, and operations. Specifically, this support consists of helping others create lesson plans using new technologies, incorporating information technologies into existing office training programs, and limited custom programming to create interactive Web sites. In addition to this extensive support, IGES staff taught short-term courses on environment and sustainable development.

2.1 Achievements

During the period from January 2000 to the present, the CB Program has developed eight software products (Table 1) in both English and Japanese.

- eLearning management (6 software products)
- eCourse (online course) authoring (2 software products)

These systems have undergone numerous separate testing sessions in English and Japanese. Full conversion into Japanese and real-time market testing began in October 2000, and they are now market-ready. Testing will continue on a wider scale into the second phase of this Program.

In addition, the CB Program has authored two large Web sites in both English and Japanese. Addresses are: www.iges.net (English) and www.iges-japan.net (Japanese). These Web sites include integration of IGES' eLearning software, contents, and systems. Limited marketing of the systems will be undertaken on the Program's Web sites.

a. IGES software and tools

In our experience, the first thing educators do once they take to the Web is digitize their paper materials, posting syllabi, assignments, and sometimes lecture notes to a course Web site. The second thing they typically do is include links to Web sites they think are interesting and in some way support the course they are teaching. While both of these activities are useful, they just scratch the surface of the Web's educational potential. The problem, of course, is that advanced functionality that takes advantage of the interactive potential of the Web through things such as collaborative tools, quizzes, or even simple Web-based email senders requires back-end programming. Our

Table 1. Types and Features of Software.

Software Title	Features
eLearning management software (6 types) • **Course Manager Pro** for companies and governments • **University Pro** for virtual universities (Japanese/English) • **Gakko Pro** for vocational/technical schools, language, and other schools (Japanese/English)	Software for the integrated management of eLearning, with the ability to work on everything on-line from uploading training courses, instructor assignments, student registration, automatic progress reports, and management of grades and student information. (Compatible with UNIX or Windows NT servers.)
eCourse authoring software (2 types) • **Course Maker** (Japanese/English)	Software for authoring eCourses (IGES online training courses) with ease. Various resources files may be added, or multiple-choice tests and essay questions with time limits may be created and inserted smoothly. These may be used in combination with the course management software for more professional management. (Windows 95/98 and Internet Explorer version 4.01 or higher version is necessary.)

approach has been to build a suite of generic, Web-based instructional tools that educators can customize simply by filling out Web forms. Two tools are part of the initial rollout of the CB Program:

eLearning Management Tools

The eLearning management tool is an open-ended system that enables an instructor to use any document or technology to support the course, in a loose framework governed by the principle of the need for tracking—knowing who has done what, when and where.

eCourse Authoring Tools

Lets you author tests, quizzes, courses, and include resources as well as timed exams, with no programming experience.

The development of these tools has been driven by user needs, as far as we could determine, and the focus in the future will be even more so as the tools are tested fully.

All the tools utilize a common interface and operate on the following model:

(1) eLearning Management Tools create and centrally maintain security and learner bodies;

(2) a user account is created within CB program server space;

(3) users want their own personal interface, depending on whether they are an instructor, administrator, learner, or all of these;

(4) people can select from the menu of tools and then build out tools based on their needs;

(5) when complete, users are given a URL to distribute to students or link from their course Web site.

The result is that trainers and educators can easily add advanced features to their Web site, learners are confronted with familiar, standard interfaces, and IGES can focus on developing, updating, and troubleshooting a single code base. (Please refer to Chart 1 for the IGES eLearning System.)

b. IGES online eCourses

Beyond the tools, we have been developing contents and curricula that employ and draw upon the Web-based approach to eLearning. eCourses on environmental and other professional skills are available on the CB Program Web site, offered free of charge to anyone who registers. IGES hopes to continue

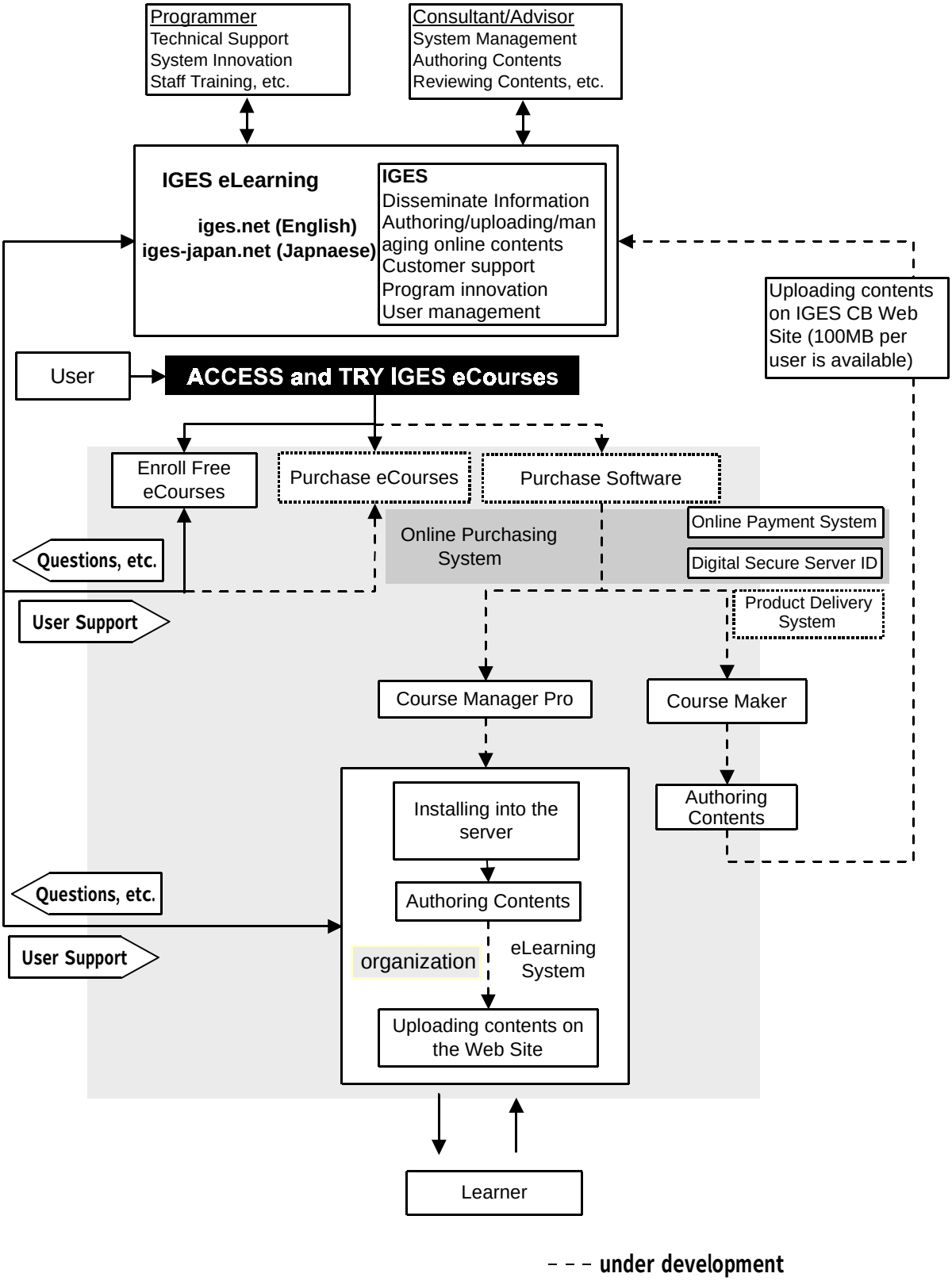


Chart 1: IGES eLearning System (As of 31st March 2001)

developing and improving the courses and their content by employing resources from both inside and outside the institute.

(1) Leadership (English)

(2) Leadership (Japanese)

(3) Environmental Leadership (English)

(4) ISO 14001 Implementation (English)

(5) Presentation Skills (English)

(6) Conflict Resolution (English)

(7) Consensus Building (English)

2.2 Workshops

Most of the CB Program workshops focused on strategic skills instruction—how to build partnerships and how to learn leadership principles, for example. The CB Program organized a seminar titled "Leadership in a New Era" in February 2001, which was not a conventional, face-to-face seminar, but employed a combination of the face-to-face format and the eLearning system. The conventional style is effective for its intimate communications among a small group of participants, but it has some restrictions in preparation, administration, and costs. Using a combination of the eLearning and conventional styles, the seminar received praise from the participants as a new training system that takes advantage of both styles.

The CB Program plans to offer effective training courses in the future that employ the eLearning system, in order to promote environmental awareness, and to support learning and capacity building in various areas. In addition, IGES has taken part in a workshop organized by the United Nations Institute for Training and Research (UNITAR).

2.3 LEAD interns

From May 2000, IGES accepted a LEAD intern, based on an agreement between IGES and LEAD (Leadership for Environment and Development) International. The intern was involved in authoring content for the eLearning system. From February 2001, another LEAD intern from ISC (Institute for Sustainable Communities) was accepted. She is currently authoring content on "Community-based Learning for Sustainability" in collaboration with the CB Program staff.

3. Conclusions

Many of our programmatic decisions are a product and function of constraints and opportunities posed by our particular environment. However, the CB Program found that the following organizational model and culture can provide it with the best way forward.

- *Maintaining Vision.* The IGES president's vision is one where teaching and learning is infused with the best technology, and "technology" becomes just another tool that helps teachers teach and students learn. We believe that this can provide the basis for strong projects and activities in capacity building. We advocate for this vision and work to support activities that will make it a reality. We don't, however, presume to know exactly how this will happen.
- *Promulgate the Vision.* Promulgating this vision throughout the CB Program—rather than promoting a single program or idea—keeps the focus on outcomes: better learning, better teaching, and more effective capacity building. It also sends a message to our partners that ideas are not only welcome, but are in fact crucial to our success and the realization of this vision.
- *Think strategically.* Operating in an environment where competition is rife and resources constrained, the CB Program is forced to continually re-examine use of time, people, and money. While we work to increase the resources we have, we also ensure that resources are being used in ways that move us toward our vision. There are many things we would like to do that we cannot; the number of good ideas always exceeds the resources available. Thinking strategically often means looking for solutions that already exist but yet to be connected with the pressing problems. It also means ascertaining ideas and projects that IGES is in a unique position to launch. The CB Program looks for ideas, projects, and opportunities that have the potential to leverage resources, and we try and take advantage of good opportunities as they present themselves.
- *Accept uncertainty, and embrace experimentation.* The CB Program accepts the fact that we are operating in a highly uncertain environment. Rather than erecting walls around our activities, we understand our success to be predicated on an ability to adapt and change. The program believes that such flexibility is possible only when an organization creates and maintains a culture of experimentation that generates and evaluates ideas and approaches, discards most of them, and embraces the ones which best advance the goals and vision.

- *Clear and open communication with stakeholders and staff ensures that uncertainties and experimentation do not become chaotic.* The CB Program accepts that it will never "get it right," but instead is engaged in a process of continual improvement, making everyone involved in the process, while understanding that experimentation and change are elements of our success, rather than proof of failure.
- *Be encouraged to collaborate.* IGES was founded as a partnership, and as the organization grows, partnerships have flourished up, down, and across the IGES research and administrative hierarchies. Apart from the formal IGES partnerships, the CB Program also seeks connections with universities, schools, NGOs, companies, and service units. Meeting with people almost always uncovers previously unknown links between their activities and those of others. Being able to broker relationships prevents people from "reinventing the wheel," and often leads to cooperative projects or initiatives.

4. Remaining issues for future research

The CB Program needs to put the lessons it has learnt in the last 18 months to practice.

There is a host of remaining issues that need to be understood and investigated, through experimentation, to seek effective capacity building approaches. To monitor the process effectively, monitoring and evaluation systems will be built in to the projects from the earliest planning stages. In particular, email and the Internet can be used to effectively evaluate online programs, as well as live feedback forms, surveys, comments, and requests.

In short, we will learn by practice how to effectively build capacity, through eLearning systems, especially in the first year of the second phase.

III

Outline of the First Phase Projects
Research Support at IGES

Outline of the Projects (Period and members)

※The period of employment of the staff members is from April 1998 to March 2001, unless otherwise indicated in brackets after each name.

Name	Climate Change Project	Urban Environmental Management Project	IGES Kitakyushu Office	Forest Conservation Project
Period	April 1998-March 2001	April 1, 1998-March 31, 2001	October 1999-March 2001	April 1998-March 2001
Members				
Project Leader	Shuzo Nishioka	Hidefumi Imura	Hidefumi Imura	Hiroji Isozaki
Senior Reserch Fellow	Naoki Matsuo			
Reserch Fellows	Tae Yong Jung (1999.4-) Kiyoto Tanabe (1999.4-)(concurrently serving as Programme Officer of TSU)	Xuemei Bai Yong Ren (1998.11-2000.12)		Masanobu Yamane (Sub-team Leader) Martinus Nanang (1998.7-) Yoichi Kuroda (1998.4-2000.3)
Reserch Associates	Aki Maruyama Koson Enoki (1998.4-2000.7) Minoru Nakada (1998.4-2000.3) Takahiro Fukunishi (1999.8-2000.3) Mitsutsugu Hamamoto (1998.4-1999.3)	Shinji Kaneko (1999.4-) Masato Nakayama (1998.4-2001.3) Miao Chang		Kimihiko Hyakumura (1998.9-) Kiyoshi Komatsu (1998.9-)
Visiting Reserchers	Cui Cheng (2000.9-2001.3) Robert Dixon (1998.10-1999.1) Maithili Iyer (1998.11-2000.1) Li Yun (1999.1-2000.1)			Makoto Inoue (Sub-team Leader) Shin Nagata (Sub-team Leader) Satoru Matsumoto (2000.4-2001.3) Eiichiro Noguchi (2000.4-2001.3) Nataria Antonova(2000.11-2001.3)
Eco-Frontier fellowship	Dong Hongmin (2000.11-2001.3) Damasa B. Magcare-Macandog (1999.9-2001.3) Li Yue (1999.11-2000.3)			
Intern	Shobhakar Dhakal (2000.11-)			
Project Secretary	Miya Iwase (1998.8-) Saho Moriguchi (1998.4-1998.7)	Rie Sugiyama (1998.4-1999.9) Tomoe Karasawa (1999.10-2001.3)		Saho Moriguchi
Editing Consultant		Changki Kwon (2000.9-2001.3)		
Collaborators		CHINA: ・Case Study Team on Yangtze Delta Area (2 people) ・Study Team on Shenzhen and Xian Cities (3 people) ・Case Study Team on Dalian City (2 people) KOREA: ・Case Study Team on Korean Cities (5 people) INDONESIA: ・Case Study Team on Indonesian Cities (2 people) JAPAN: ・Case Study Team on Kitakyushu City (3 people) ・Case Study Team on Ube City (1 person)	4 people	ST Sub-team (20 people) PM Sub-team (19 people) TT Sub-team (8 people) LA Sub-team (10 people)

Outline of the Projects (Period and members)

	Environmental Education Project	Environmental Governance Project	New Development Patterns Project
Period	April 1998-March 2001	April 1998-March 2001	July 1998-March 2001
Members			
Project Leader	Osamu Abe	Hisakazu (Kazu) Kato	Kazuo Matsushita
Senior Reserch Fellow	Bishnu Bhandari (1998.6-)	Glen Paoletto(1998.4-1998.9)	
Reserch Fellow		Yohei Harashima (1998.4-2000.3)	
Reserch Associates	Masahiro Takahashi Masahisa Sato (1998.5-2001.3) Ko Nomura (1998.5-2001.3)	Wakana Takahashi (1998.4-2001.3) Shinsuke Koga (1999.5-1999.9) Shuzo Katsumoto (1999.5-1999.10)	Takashi Otsuka (1999.5-) Rie Sugiyama (2000.4-) Shuzo Katsumoto (2000.4-)
Project Secretary	Rie Sugiyama (1998.4-1998.7) Kayo Morimoro (1998.8-1999.8) Yuko Tanno (1999.8-2000.5) Sumiyo Morita (2000.5-2001.3) Ryoko Fukuhara (1999.1-1999.7)	Chiharu Morita (1998.4-2000.4) Sumiyo Morita (2000.5-2001.3)	Naoko Miyazaki (1999.1-)
Research Development Manager	Shigeyuki Okajima (1999.4-2001.3)		
Collaborators	48 people (40 from overseas and 8 from Japan)	Country Studies (22 people) Study Group on Business and Environmental Governance (10 people) Brainstorming Forum on Acid Rain in East Asia (3 people)	

Outline of the Capacity Building Program

	Capacity Building Program
Period	June 1999-March 2001
Members	
Program Manager	Glen Paoletto
Web Management Officer	Reiko Koyama
Secretary	Sue Park
Collaborators	3 people
Collaborating organizations	11 organizations

Outline of the Projects (Project expenses)

unit:Thousands of Yen

	total	FY1998	FY1999	FY2000
Climate Change Project	**316,835**	74,591	133,049	109,195
Urban Environmental Project	**239,219**	79,267	83,328	76,624
IGES Kitakyushu Office	**75,029**	--------	25,604	49,425
Forest Conservation Project	**217,929**	74,338	74,619	68,972
Environmental Education Project	**202,050**	67,107	67,762	67,181
Environmental Governance Project	**109,338**	41,076	44,784	23,478
New Development Pattern Project	**132,167**	23,057	42,823	66,287
Capacity Building Program	**97,972**	--------	33,116	64,856

Research Support at IGES

Summary

In order to smoothly and effectively promote the activities of research projects, IGES has been collecting necessary information and preparing a suitable environment for research activities. Moreover, IGES as a whole has been supporting research activities by establishing a library and the research section besides the administrative section in the secretariat in order to disseminate its research results widely in Japan and the world.

The research support section and the library have been supporting research activities through the organization of forums and seminars, publication of research reports and other publications, public relations activities, collection of research reference books and journals, and provision of an information search system. In addition, there has been a support in receiving non-Japanese researchers from abroad.

The changes in the general account expenditure (expenses for the promotion of projects and for the general and administrative expenses) in the general account during the First Phase is as shown in Table 1. The changes in the number of staff members (the research staff and the secretariat staff) is shown in Table 2. Please refer to Chart 1 for the list of major activities.

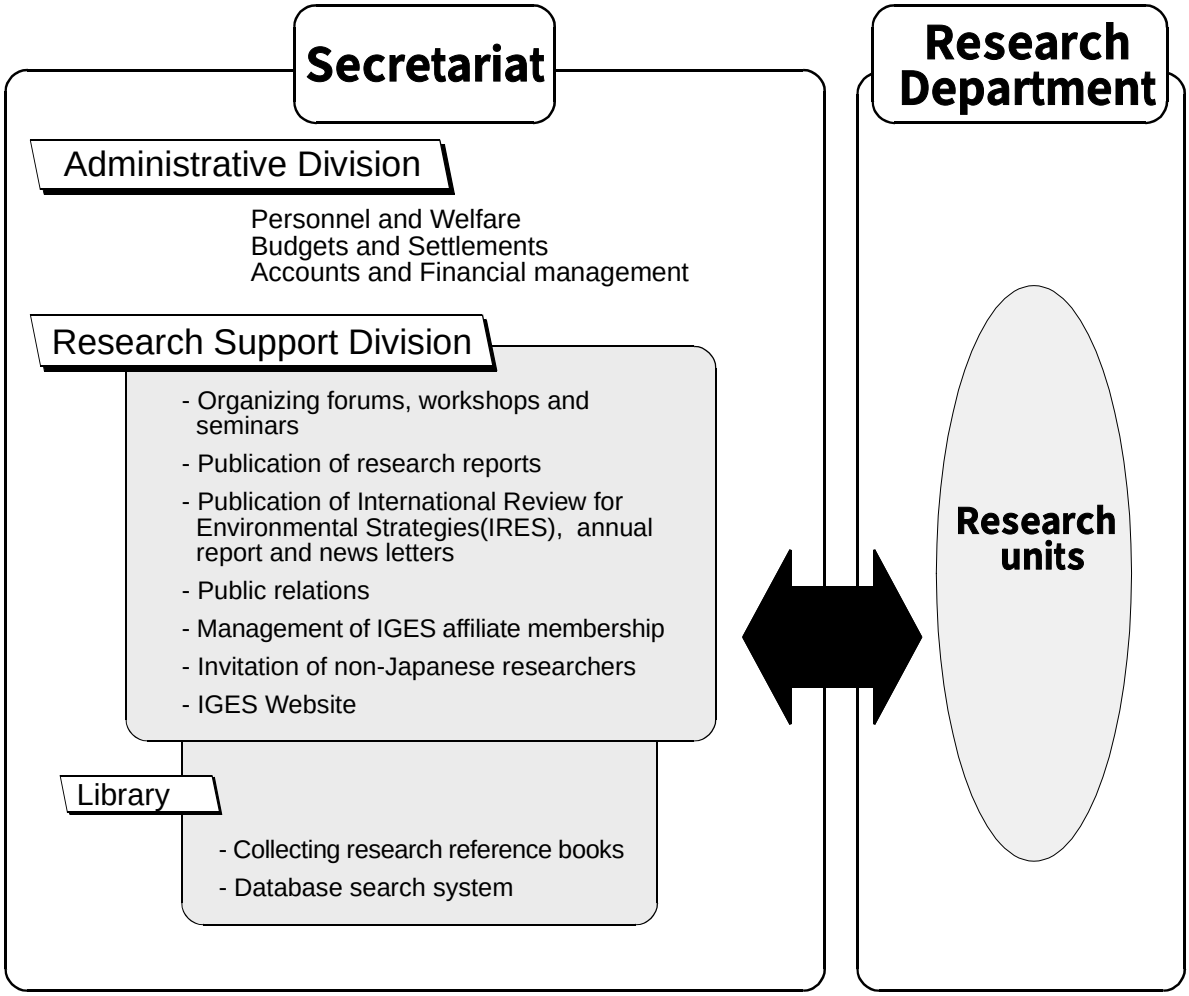


Chart 1 Major activities of Research Support

Table 1　Changes in the general account expenditure

		FY1998	FY1999	FY2000
General Account	Expenses for the Promotion of Projects	540,541	580,700	549,430
	General and Administrative Expenses	177,215	191,990	259,285
	Others	9,176	132,372	156,771
	Total	726,932	905,062	965,486

Unit: 1,000yen

Table 2　Changes in the number of staff members

	FY1998	FY1999	FY2000
Research Staff	33	46	40
Secretariat Staff	27	27	35
Total	60	73	75

Unit: people

*Number of staff members is as of the end of each fiscal year.　The number of the secretariat staff includes the number of project secretaries.

1.　Major Research Support Activities

(1) Organization of forums, workshops, and seminars

Besides hosting the seven-part series of the Open Forum to Address Global Warming planned by the Climate Change Project over a period of two years, IGES hosted international workshops on forest conservation, a symposium on business and environmental governance, and open seminars for IGES affiliate members. (see Chart 2)

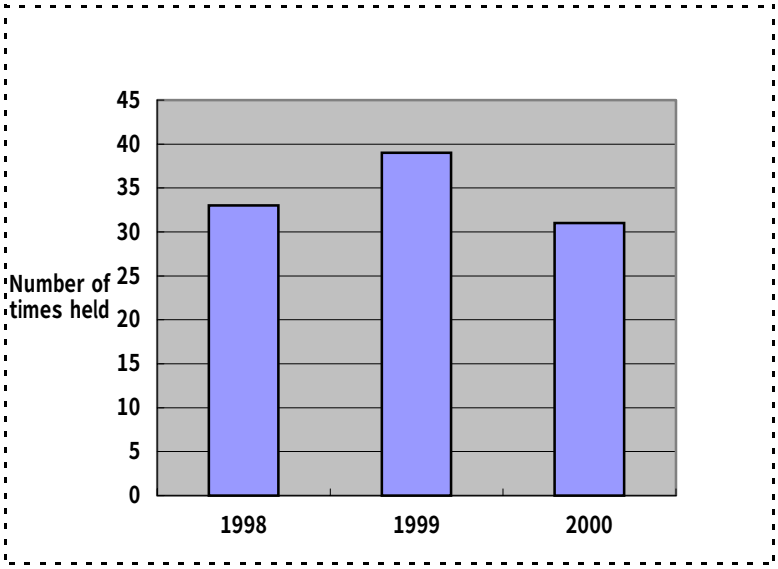


Chart 2　Number of forums and seminars organized by IGES

(2) Publication of research reports, International Review for Environmental Strategies (IRES) and other publications

IGES has published research reports for each project, commercial publications, IRES which is a collection of academic papers and research reports, and the annual reports which compile activities at IGES for each fiscal year.

IGES utilized the networks expanded through its research activities to publish Top News on Environment in Asia every year since 1998.

(3) Public relations activities

In addition to the publication of research results (academic papers, research reports, reports of survey results) mentioned above, information on events was disseminated to related parties. Also, research activities were introduced through newsletters, IGES website, and the E-alerts, a kind of news media which uses the Internet.

At the same time as providing information about IGES activities to newspapers and news agencies, IGES hosted a seminar prior to the Conference of the Parties of the United Nations Framework Convention on Climate Change.

(4) Collection of research reference books, and provision of information search system (at the library)

IGES established a library and collected academic books and journals (see Chart 3), provided references and information through database search systems of the Internet, and offered reference acquisition services from external libraries using the inter-library loan system.

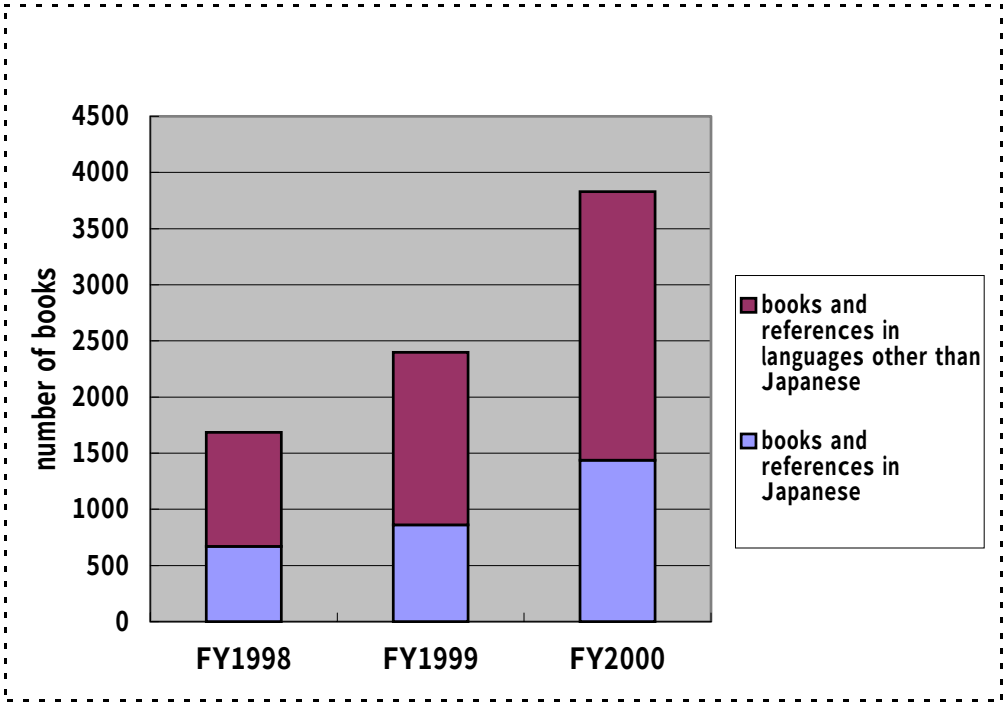
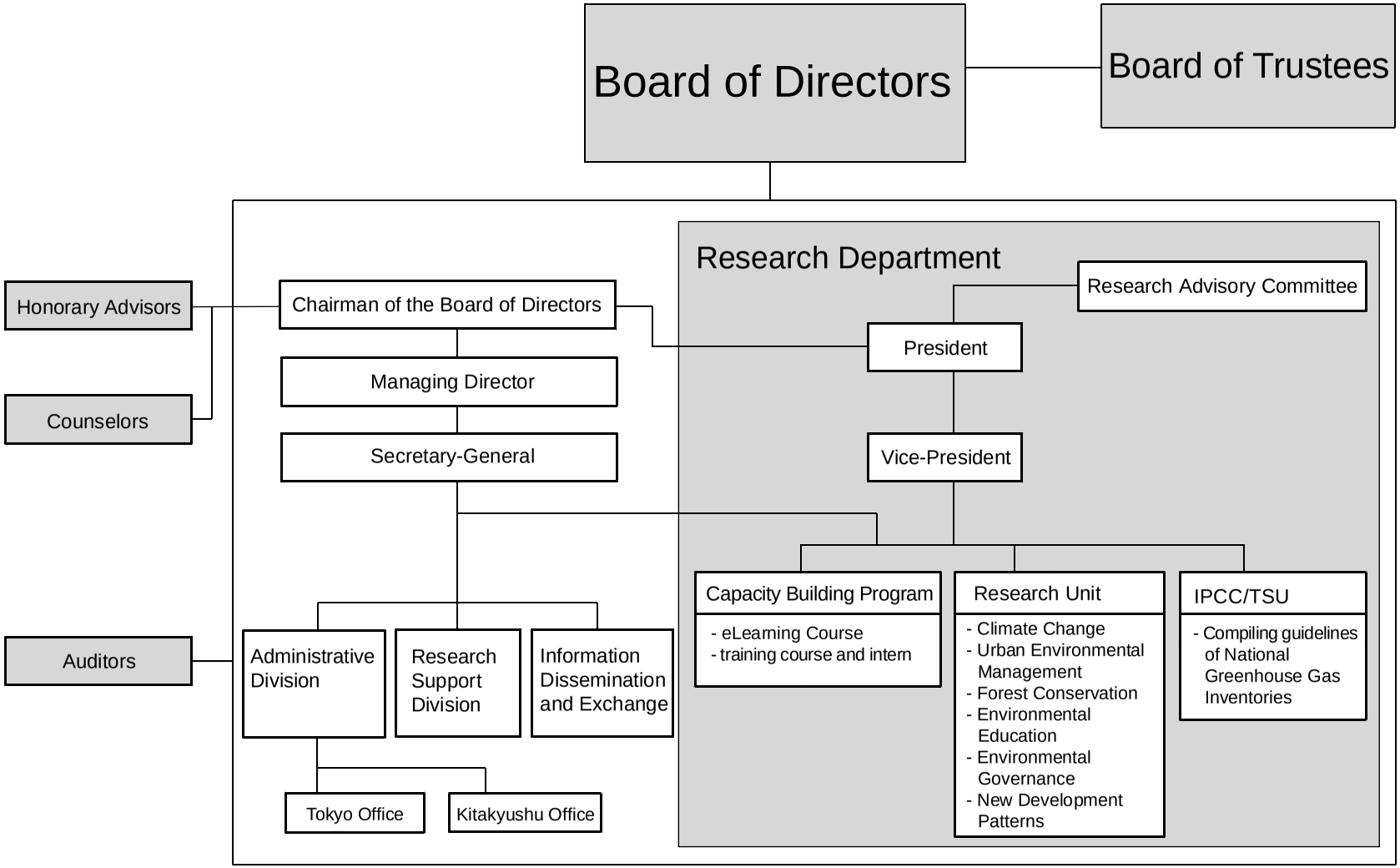


Chart 3 Changes to the number of library books

(5) Invitation of non-Japanese researchers, and receiving and dispatching of visiting researchers

IGES offered support when receiving long- and short-term visiting researchers and interns, inviting non-Japanese conference participants from abroad, and dispatching IGES researchers abroad. In addition, Japanese classes were periodically held as part of activities to support the daily lives of non-Japanese researchers working at IGES.



Organizational Chart