Climate Policy Project

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1. Overview

1.1. Background, objectives, and approach

1.1.1. Background

During the first three-year phase of research (April 1998–March 2001), the Climate Change Project conducted research on initiatives based on international negotiations held under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol processes. The primary focus during that phase was on the system design of the Kyoto Mechanisms, such as emissions trading and the Clean Development Mechanism (CDM). Several timely proposals were made to both domestic and international audiences, and a number of contributions were made to academic journals. In parallel, the project established a basis for long-term research by developing original methodologies such as IGES' regional energy/environment model, called the Greenhouse Gas Emission Model for Asia (GEMA).

Building on these accomplishments and based on intensive discussions with policy-makers and researchers across the Asia-Pacific region, the project re-oriented its work in the second phase (April 2001–March 2004) with a focus on three main sub-themes: domestic policies, international cooperation, and vulnerability and governance issues. Additional work on a few related topics (e.g., post-Kyoto issues) was initiated in preparation for the third phase. To emphasise the shift of our focus to strategic climate policy research, the name of the project was changed from the "Climate Change Project" in the first phase to the "Climate Policy Project" (CP) in the second phase.

The second research phase of IGES was characterised by divergent and sometimes conflicting developments in international, regional, and national climate policy. Such developments obviously influenced and will continue to affect the nature and focus of our work. First of all, there is significant scientific, political, and economic uncertainty surrounding the climate issue, but there is a growing consensus that prompt global action to mitigate climate change is essential. At the international level, scepticism on the vitality of the global climate regime prevailed in some circles because of the rejection of the Kyoto Protocol by the United States (U.S.) and the slow progress in its ratification by Russia. On the other hand, several countries including those in the developing world continued to repose confidence in the Protocol. As of 1 February 2004, as many as 120 countries have ratified/acceded or approved the Kyoto Protocol, including 32 industrialised countries representing 44.2 percent of global emissions. Likewise, international negotiations on methodological issues related to Kyoto mechanisms, particularly the Clean Development Mechanism (CDM) advanced rapidly. Despite the uncertainty surrounding the fate of the Kyoto Protocol, preliminary research on further commitments for the period from 2012 onwards has been taken up by a few progressive groups in the world. We are pleased to report that our team is now recognised as one of these groups. At a regional level, the European Union (E.U.) recently adopted a directive on an E.U.-wide emissions trading system for companies to be effective from January 2005. Indeed many European policy-makers and businesses now seem to favour going ahead with designing and implementing such systems irrespective of the status of ratification of the Kyoto Protocol. At the domestic level, Japan ratified the Kyoto Protocol in June 2002, but different schools of thought both in support of and against the Protocol emerged and added to confusion in international circles on Japan's ability to meet the emission reduction targets for the first commitment period.

1.1.2. Objectives and approach

The main questions posed by our team in each sub-theme at the beginning of the second phase are listed below, and the approach followed to achieve various objectives is briefly discussed under each question.

a. Domestic policies

1. What should the Japanese domestic policy entail in order to comply with the Kyoto Protocol?

As Japan is one of the major industrialised countries in the world, the design of its policy measures is a key issue in formulating international policy measures for climate change mitigation. Research was focused, therefore, on determining the "best policy mix" for Japan in order to comply with the Kyoto Protocol not only through examination of current policies of Japan but also those of countries with progressive policies such as Germany. Some effort was directed to the understanding and design of international mechanisms such as emissions trading that conform to the domestic policies.

2. Which policy measures are effective in encouraging the participation of the industrial/business community and promoting technological innovation?

This issue was originally planned to be addressed by examining the impact of domestic climate policies on the business sector and by exploring prospects for long-term technological innovation by industries. It was also proposed to examine a greenhouse gases (GHG) accounting system of the private sector and determine the industrial structural change necessary to promote innovation of climate-friendly technologies and policy measures to promote such structural change.

b. International cooperation

1. Which measures and mechanisms are necessary to effectively promote international cooperation between developed and developing countries in Asia?

Japan, as the only Annex I country in Asia, recognises the need to take specific actions domestically and internationally to reduce its GHG emissions. It also has a great responsibility for technology transfer and financial assistance to developing countries. On the other hand, in light of the rapid economic growth in developing countries of Asia, GHG emissions are expected to grow rapidly. Therefore, cooperation between developing and developed countries in Asia is essential to meet the ultimate objective of the UNFCCC (i.e., stabilisation of GHG concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system).

Research was directed on several fronts to address this sub-theme. Substantial efforts were devoted to identify measures to close the gap in discussions between developed and developing countries and to motivate developing countries to reduce their GHG emissions. Additional work was planned to identify measures for effective utilisation of Japanese overseas development assistance (ODA) with a view to ensure prioritisation of environmental protection programmes for developing countries. The prospects for international energy and environmental cooperation among Russia, China, Korea, and Japan, and the impact of such programmes on energy and environmental policy in Asian countries were also examined.

The optimal design of the CDM from the developing countries' viewpoint, including its integration in domestic policies and evaluation of prospects for replication of policies of developed countries in developing countries, are vital to promoting North-South cooperation and sustainable development. A few studies were conducted, therefore, to examine both the methodological and implementation aspects of the CDM. Measures for establishing cooperation mechanisms in the background of changing domestic and international geo-political conflicts were also explored. Field studies to establish a model case for climate policy in Asia were conducted.

2. How much progress has been made in research on estimation methods of greenhouse gas emissions and absorption?

The national GHG inventory is the ultimate measure against which a country will be judged in reporting under the UNFCCC and the Kyoto Protocol in the future. Progress is measured through the use of a set of inventory methodologies and reporting guidelines agreed to by the Framework participants. Studies to determine the level of accuracy in the measurement of GHG emissions in Asia, and the compilation of a database were, therefore, considered critical to this effort. In addition, studies to determine the extent and accuracy of understanding regarding the carbon sequestration sinks in Asia and to analyse implications of the establishment of an inventory estimation method on international policy were planned.

c. Vulnerability and governance issues

1. How can the vulnerability to climate change in Asia be evaluated? What kinds of adaptation strategies are desirable?

As Asian countries are already facing adverse impacts of climate change, it is important to design policies to reduce such vulnerability. The design of such policies, however, is very much dependent on accurate vulnerability assessments. Therefore, studies were planned to identify the most vulnerable areas to climate change in Asia and to review the concept of "adaptation." Since local knowledge is an important component in designing adaptation policies, a few efforts were directed towards analysing options for integration of such knowledge into adaptation policies.

2. How should the governance of climate policy be conducted in terms of global carbon cycle management including the sink issues and international politics?

International climate policy has been evolving gradually with the emergence of new actors (e.g., the private sector and non-governmental organisations), parallel approaches, and regulatory mechanisms encompassing different sections of society. An increasing rift in climate policies between major players, namely, the United States, European Union, Japan, and major developing countries, is a point of concern in determining the success of the future climate regime. Preliminary studies on governance of climate policy including work on incentives for achieving global participation were, therefore, initiated in this phase to provide a base for further studies in the third phase.

1.2. Review of achievements

1.2.1. Domestic policies

Studies under this sub-theme form the core of our support towards Japan's national climate policy development, which includes work on Japan's approaches and options to achieve the Kyoto Protocol targets. Key accomplishments are discussed below.

One major outcome from our project's research on Japan's domestic climate policy is a report entitled "Policy Proposal for Japan's Domestic Climate Policy" (IGES August 2002), which is a compilation of achievements over the past few years. It is a comprehensive proposal covering a wide range of fields, and it integrates the outputs of various public forums and workshops, including the IGES Open Forum on Countermeasures for Global Warming (which staff from business, research, and government sectors attended), the Joint Research Workshop on the U.K. Climate Policy (June 2001) with major think-tanks, and several brainstorming workshops with the Japanese business community (August–October 2001). Based on an analysis of current policy measures and issues to be addressed, various combinations of economic measures, command-and-control measures, and voluntary measures were recommended as part of a new institutional framework. Although further discussion is necessary in terms of the feasibility of a new institutional framework and its consistency with the existing framework, it must be noted that the formulation of such a draft by a non-governmental organisation (NGO) was a breath of fresh air into the system design and that it formed a solid basis for further discussions in Japan. The

report was presented in August 2002 at a meeting attended by nearly 250 participants from public and private organisations. It was accepted as the first recommendation for a comprehensive global warming countermeasure policy. A comparative study on energy policies of Japan and other developed countries, and a study on domestic policies including emissions trading systems, which formed the basis of this report, were published elsewhere.[1] Our researchers also co-authored a Pew Centre report on climate change mitigation in Japan, focusing on policy aspects.[2]

The IGES Open Forum on Countermeasures for Global Warming was held twice in 2001 and once in 2002, where issues for further development of domestic climate policy were discussed by the officials of concerned government agencies, researchers, and business personnel. The forums were especially appreciated because critical aspects for adjustments of domestic legislation in order to ratify the Kyoto Protocol were discussed and the differences among views and interests of various stakeholders were clarified. Indeed, discussions at these forums in 2001 served as an input to the comprehensive report published in 2002. All open forums drew wide attention, as evidenced by the high participation of diverse stakeholders. Summaries of the forums were posted on the IGES Web site for further feedback.

A report entitled "Technologies for the Reduction of GHG to Achieve the Goals of the Kyoto Protocol" was compiled by the project leader, who also served as chair of the Global Environmental Committee of the Ministry of the Environment. The report examined in detail the technologies to reduce GHGs in Japan and derived a GHG emission reduction cost curve. The report was used as the basis for preparation of the *Guidelines for the Prevention of Global Warming in Japan 2002*.

In order to inform the Japanese public of the progress in international negotiations in the abatement of global warming, post-Conference of the Parties (COP) seminars were held every year in association with the Global Industrial and Social Progress Research Institute (GISPRI). The presentations made by our researchers at these seminars were appreciated by people from all sectors of Japanese society, and the proceedings of these seminars were published and disseminated to various Japanese stakeholders.

Now that the Kyoto Protocol is close to coming into force (with the expectation that Russia will ratify it in mid-2004), how to achieve the GHG emissions reduction goal as promised in the first commitment period is an important challenge for Japan. The present policy, based on the Guideline of Measures to Prevent Global Warming, is to be reviewed in 2004. Since achieving the reduction goal by the current policy framework is regarded as unlikely, enforcement of more effective policy packages would be necessary from 2005. Therefore, policy research focusing on the design of a domestic system that complies with the Kyoto Protocol is in progress. A revised package of policy proposals is in preparation, and it includes both quantitative evaluation of policies using energy modeling approaches and qualitative evaluation such as through comparative studies on global warming policies among developed countries.

A comparative analysis of climate policy decision-making in the E.U. and Japan was conducted not only to find ways to design and implement effective climate policies appropriate to the Japanese context, but also to contribute to discussions on post-Kyoto issues by finding incentives for the E.U. to lead international negotiations. As voluntary approaches were used as the main instrument for addressing carbon dioxide (CO_2) emissions from the industrial sector in both Japan and the E.U., a comparative study of such approaches was undertaken in 2001 and 2002. Findings from this study were published in an academic journal[3] and a number of books[4] and used as inputs to the IGES proposal titled "Domestic Policies and Measures to address Climate

1 Matsuo, N. 2001. "Bonn Agreements as a New Business Opportunity: How to develop the new businesses under the carbon constrained world," Energy Forum, October (in Japanese).

2 Yamaguchi, K. and Matsuo, N. 2001. "Climate Change Mitigation in Japan" (chapter) pp. 132–147. In: Climate Change: Science, Strategies & Solutions, E. Claussen, V. A. Cochran, and D. P. Davis (eds.) Pew Center, USA.

3 Watanabe, R. 2002. Voluntary approaches in energy policy—A comparative study among four European countries and implications for Japan. *Journal of Environmental Law and Policy* Vol.5, Shojihomu kenkyukai (in Japanese).

4 Watanabe R. 2001. Voluntary Approaches. Environmental Management Handbook Sangyo Kanri Kyokai (in Japanese); Watanabe R. 2003. Voluntary Approaches. Environmental Law and Environmental Policy. Yumihiko Matsumura (ed), Sangyo Kanri Kyokai. (in Japanese);

Change Mitigation in Japan." A report on a comparison of voluntary approaches to curb global warming by two Japanese cities—Kitakyushu and Yokohama—was published by the Organisation for Economic Cooperation and Development (OECD).[5] In 2003, a more comprehensive analysis of Japanese and German climate policy decision-making processes was undertaken, and preliminary results were summarised and presented at a seminar at Bonn University.

In July 2003 the directive on establishing an emissions-trading scheme within the E.U. was adopted. As the scheme will cover an increasingly large proportion of the total emissions regulated under the Kyoto Protocol, it is expected to bring in many changes in the policies and measures of member states. Voluntary approaches, most dominant so far in member states, would be forced to adjust to emissions trading. Furthermore, the birth of the first regional emissions-trading scheme would indirectly affect climate policies and measures in Japan. In order to examine the rationale for introduction of the emissions-trading scheme in the E.U. and the issues to be overcome for its introduction, one of our researchers conducted research on the directive-making process of the E.U.'s emissions-trading scheme, utilising the opportunity to stay as a visiting researcher at The World Conservation Union (IUCN) Environmental Law Center and Wuppertal Institute in 2003. The findings were published as an IGES working paper in Japanese[6] as well as in English. As part of the comparative studies on the characteristics of transport energy demand in the United Kingdom (U.K.) and Japan, and their implications for energy and climate policies, one of our researchers published a report in an academic journal.[7] Our researchers disseminated a report to Japanese policy-makers on domestic emissions trading in the U.K. as soon as the system was introduced there.

Since the U.S. is the world's biggest GHG emitter, its policies have wide implications on the stabilisation of the global climate. One of our researchers analysed the new administration's climate initiative and its long-term implications.[8] The issue of U.S. state and local climate policies was also the subject of studies by one of our researchers and an intern, and it was concluded that state-level initiatives deserve appreciation but do not meet the expectations of the global community and that there was a strong need for integrating such initiatives with those of the federal government. A preliminary report is in the process of being published in a Japanese journal.[9] At the request of Japan's Ministry of Environment (MOE), our researchers compiled various publications on domestic policies in the U.S. and submitted them at regular intervals. These reports were used as an information source for Japanese policy-makers. In cooperation with Resources for the Future (RFF), we held a one-day workshop sponsored by the MOE in Washington D.C. on domestic policies in the U.S. and Japan.

Insofar as the work on the role of Japanese businesses and industries in the abatement of global warming is concerned, our progress has been patchy. As explained earlier, several brainstorming workshops with the Japanese business community were held in 2001, but specific policy measures were not published due to lack of suitable human resources to follow up on such discussions. And a reshuffling of research themes among IGES projects also led us to reduce our focus on this sub-theme, in part for reasons such as the fact that it was chosen as a field of study by researchers at the Kansai Research Centre, and that some aspects of the role of Japanese businesses have also been taken up by the Environmental Industry sub-project of IGES' Long-Term Perspective Project (LTP). Another reason was that a researcher who had originally proposed to conduct research on prospects for long-term technological innovation left IGES to join a university.

Watanabe R. 2004. Climate policy in the Netherlands—Law and policy for addressing global warming. Tadashi Otsuka (ed), Showa-do, Sangyo Kanri Kyokai (in Japanese).

5 Imura, H. and Watanabe, R. 2002. Voluntary Approaches—Two Japanese cases: Pollution Control Agreements in Yokohama city and Kitakyushu city, Env/EPOC/WPNEP(2002)12, Paris, OECD.

6 Watanabe, R. 2003. Directive Making Process of EU Emissions Trading <http://www.iges.or.jp/ipkp/pdf/EU_watanabe.pdf>.

7 Hunt, L. and Ninomiya, Y. 2003. "Unravelling Trends and Seasonality: A Structural Time Series Analysis of Transport Oil Demand in the UK and Japan." *Energy Journal*, Vol. 24, No. 3, pp. 63–96, 2003.

8 Matsuo, N. 2002. "Analysis of the U.S.'s New Climate Initiative: The attitude of the Bush Administration towards Climate Change," *International Review for Environmental Strategies*, 3(1): 177–187.

9 Tamura, K. 2004. State-level mitigation policy in the USA. *Environmental Science* (in press) (in Japanese).

1.2.2. International cooperation

Asian countries are diverse in their interests on the issue of climate change. The CP Project examined the diversity of such interests by conducting policy dialogues and undertaking research collaboration with policy-makers and researchers in various Asian countries. The international cooperation component also helps Japan maximise its ability to meet the Kyoto commitments, contributes to global climate change objectives, and maximises opportunities for cooperation among policy-makers and business circles in Japan and developing countries.

Limited understanding of climate change issues is a major barrier in designing pragmatic policies. Our efforts were, therefore, first directed to enhancing dialogues among various stakeholders in developing countries. At first, with cooperation from the United Nations Environment Programme's (UNEP) Collaborating Centre on Energy and Environment (UCCEE, Denmark), the Energy Research Institute (ERI) of China, the Korea Economics and Environment Institute (KEEI) of South Korea, The Energy and Resources Institute (TERI) of India, the Thailand Environment Institute (TEI), the Environment Agency of Vietnam, and the Environment Ministry of Cambodia, bilateral workshops on the theme of "Climate Policy Dialogue in Asia" were held in China, South Korea, India, Thailand, and Vietnam. At each workshop, a detailed analysis of climate change issues was made, along with discussions on each country's specific needs to mitigate global warming and the common challenges facing policy-makers across Asian countries. The results from this series of workshops were published as a report entitled "Climate Policy Dialogue in Asia" (IGES, August 2002). It was widely distributed at international conferences such as the World Summit on Sustainable Development (WSSD) and COP8. The dialogues also served as a forum for preliminary discussions on the role of developing countries in future commitment periods. Side events were held at both COP7 and COP8 to discuss findings from the policy dialogues in Asia. Based on consultations in the above stakeholder dialogues, it was concluded that further efforts to promote information outreach in the region in the climate policy arena are critical. Country-specific climate policy fact sheets are considered a useful medium to fill this gap. A presentation on IGES climate policy dialogues and the utility of fact sheets was made at the World Climate Change Conference held in Moscow (29 September–3 October 2003).[10]

In addition to bilateral workshops, an international workshop titled "Climate Policy of Asia" was held to exchange information and conduct comprehensive and integrative discussions on climate change issues and policies in Asia. Many specialists and government officials from both within and outside Asia attended the workshop, and a wide range of issues such as the energy forecast of Asia, GHG emissions profile, and domestic climate policies were discussed. Extensive discussion was also held on challenges that a researcher or government representative will face in the next few years. A CD-ROM report, *Climate Policy of Asia*, was produced as a result of the conference and distributed on various occasions including COP8 and COP9.

In order to analyse the obstacles and opportunities for regional cooperation in implementing the Framework Convention on Climate Change by the four countries of the Northeast Asia Region (Japan, South Korea, China, and Russia), the CP Project conducted an international collaborative research programme entitled "Policy Design of Climate Change Collaboration in Northern Asia" with ERI, KEEI, the Russian Academy of Sciences, Asia Pacific Energy Research Centre (APERC), and other research institutes. In addition to conducting a qualitative analysis of the potential and outcomes of cooperation in Northeast Asia, the project completed a quantitative analysis using the IGES Greenhouse Gas Emission Models for Asia (GEMA). The research results (a final report and workshop proceedings) were published as a CD-ROM—*Policy Design of Climate Change Collaboration in Northern Asia* (March 2002). The report was also posted on the IGES Web site. The above-mentioned study on

10 Srinivasan, A., Nishioka, S., and Morishima, A. 2003a. Climate policy fact sheets for Asia and the Pacific: A new IGES initiative for climate information outreach. Abstracts World Climate Change Conference. 106–107.

———. 2003b. Climate policy dialogues and fact sheets: IGES initiatives for information outreach in Asia and the Pacific. Proceedings of the World Climate Change Conference. 12pp. (in press).

the potential of Northeast Asian regional cooperation was published as a research paper, which was acclaimed to be spearheading research in this field,[11] and as part of a book.[12]

Since the discussion on ways to implement the Kyoto Protocol was opened up following the adoption of the Marrakech Accord at COP7, the CP Project, in collaboration with Japan's Ministry of Foreign Affairs, held an informal international symposium in July 2002 to explore the role of international cooperation in climate policy. The symposium was recognised for its contribution to the promotion of Japanese diplomacy in the field of climate policy.

In December 2002, IGES hosted a workshop entitled "Energy Modelling for Climate Change Countermeasures" with the participation of energy modelling researchers from all over Asia to exchange information on energy policies, energy demand and supply models, possibilities for the development of an integrated energy model, and modelling techniques in Asia. This workshop was widely considered as a new attempt to focus on energy modelling that incorporated special characteristics of Asia. Participants of each country, therefore, expressed strong desire for such meetings to be held on a regular basis in the future.

At both COP8 and COP9, it was pointed out that promoting informal dialogue with developing countries is fundamental to achieving global participation. Our staff therefore examined concrete cases of win-win solutions in promoting knowledge/technology transfer in order to further enhance the dialogue between developed and developing countries. The CDM is considered a win-win strategy aimed at reducing GHG emissions while promoting sustainable development in developing countries. Our initial work in this phase focused on the methodological issues of the CDM, which was appreciated worldwide. An output of such work on the reality and development of the CDM baseline setting was posted on the IGES Web site as a working paper. We are also pleased to report that a project design document (HFCs decomposition project in Ulsan, Korea), prepared with the help of a former staff member (currently a visiting researcher), was accepted by the CDM Executive Board. As part of the IGES-Wuppertal Institute joint symposium, held in Berlin in October 2003, one of our researchers discussed opportunities for creating a market and enabling environment for the CDM in Asia.

Because the CDM is now entering the implementation phase, building the capacity of policy-makers, the private sector, and academia in Asia is vital. Building capacity can increase the chances for the transfer of clean technologies and finances to mitigate climate change, thereby contributing to a range of benefits, including reduced air pollution, improved natural resource management and, of course, the mitigation of climate change impacts. The success of the CDM, and therefore the ability of Japan to benefit from it, rests on the capacity of Asian developing countries to develop and screen CDM projects. At the request of the MOE, our researchers designed a framework for a new project on integrated capacity strengthening for the CDM that focuses on three sectors: waste management, biomass and renewable sources of energy, and small-scale integrated CDM projects. Various capacity-building activities were initiated in 2003 in Cambodia, Indonesia, India, and the Philippines, in collaboration with various local organisations (e.g., TERI, Winrock International and Development Alternatives in India, and Pelangi and YBUL in Indonesia) and national and international organisations (e.g., UNEP, UNDP, World Bank). In order to publicise this activity and build further networks with organisations sharing mutual interests in the CDM field, a side event entitled "CDM in Asia: Opportunities and Obstacles" was held at COP9 in Milan in December 2003. This event was successful both in terms of attendance and presentation contents. At this event, our researchers discussed "methodological and technological barriers for CDM implementation in Asia" and an "IGES initiative on integrated capacity strengthening for CDM in Asia." In addition, one of our researchers made a presentation at the Climate Technology Bazaar, held in Delhi, India, on Japan's policy to operationalise the CDM. Our staff also directed the work of an intern from Kyoto University, who examined various barriers for capacity building for the CDM in Asian countries and the ways to close the gap between Asia

11 Takahashi, W. and Asuka, J. "The Politics of Regional Cooperation on Acid Rain Control in East Asia," *Water, Air, and Soil Pollution*, 130: 1837-1842, 2001.

12 Takahashi, W. 2002. "Problems of Environmental Cooperation in Northeast Asia: The Case Study of Acid Rain" pp. 221-247. In: International Environmental Cooperation: Politics and Diplomacy in Pacific Asia, Paul Harris (ed.) University Press of Colorado, USA.

and Latin America in terms of CDM information outreach and implementation activities. A working draft of her work is nearing completion. A presentation on the capacity-building needs of Asian countries, based on missions to Indonesia, Thailand, Cambodia, and India, was made at the 13th Asia-Pacific Seminar on Climate Change in Miyazaki, Japan. In addition, a visiting researcher from the Energy Research Institute of China analysed CDM potential in China, investigated various barriers for CDM cooperation between China and Japan, and suggested measures to promote effective technology transfer. She pointed out that enhancing dialogue between the private sectors of Japan and China is vital for promoting CDM cooperation.

Photo 1. COP9 side event "CDM in Asia: Opportunities and Obstacles" (Milan, Italy, 5 December 2003)

Financing climate change mitigation projects in developing countries will continue to be an important area in climate policy. We focused some of our research in this area, especially in 2001. A report based on this work was published in an international journal.[13]

a. International cooperation in GHG inventory preparation

Starting from its first research phase, the CP Project attempted to improve the GHG inventories of various countries in Asia, as part of a three-year project (1999–2001) funded by Japan's Ministry of Environment. This activity was intended to support and contribute to the activities of the Technical Support Unit (TSU) of the Intergovernmental Panel on Climate Change (IPCC) National Greenhouse Gas Inventories Programme established at IGES in September 1999.

The Asia-Pacific region inventory researcher network, which is an outcome of our project in its first phase, was fully utilised in the second phase to promote experimental research and focus discussions on emission sources and sinks of high priority in various countries. Significant research results were obtained and several recommendations were made to the IPCC. For example, in the field of land use and forestry, researchers of three Southeast Asian countries (Thailand, the Philippines, and Indonesia) collaborated and collected various data on

13 Zhong Xiang, Z. and Maruyama, A. 2001. Toward a private-public synergy in financing climate change mitigation projects. *Energy Policy* 28/15, pp.1363–1377.

forest carbon, and then evaluated and improved the biomass volume (carbon stockpile) estimation model using allometric growth measurement formulae. In the field of agriculture, they examined recent research on estimation methods of GHG emissions from rice cultivation, and contributed to the discussions at the IPCC for further improvement of the estimation method.

An international workshop on GHG inventories was held at IGES (Hayama, Kanagawa Prefecture) on 17–18 January 2002 to summarise the activities of the three-year project (1999–2001). At this workshop, besides presenting the research results of three years and sharing knowledge with inventory specialists from Asian countries, topics were discussed such as "The Application of Good Practice Guidance and the Priorities for Future Research," "Challenges to Create a GHG Inventory from the Standpoint of the Institution, Methodology and Organisation," and "The Role of the Specialist Network Now and in the Future (The importance of Asian initiatives and the active participation of specialists from Asia)." The workshop greatly contributed to the diffusion and exchange of useful information and knowledge on the improvement of GHG inventories in Asia. Research outcomes of various participants were published in academic journals, and their papers were compiled as a report of the workshop.

The need to develop and strengthen local know-how and expertise in GHG inventory preparation on a continuing basis is critical in developing countries. As part of this project in this phase, we hosted a Cambodian researcher and trained him in various aspects of GHG inventory preparation. We are glad to report that his training at IGES helped him in part to reach an important position within Cambodia's Ministry of Environment. Additional work on GHG inventories was stopped largely because the Technical Support Unit of the IPCC at IGES and the National Institute for Environmental Studies (NIES) took over this function.

1.2.3. Vulnerability and governance issues

COP6 and COP7 of the UNFCCC established the Adaptation Fund, Special Climate Fund, and the LDC Fund for National Action Plan for Adaptation (NAPA) and delegated the management of these funds to the Global Environment Facility (GEF). The GEF has been working with its implementing agencies (UNEP, UNDP, World Bank) on the formulation of investment strategies and has been requesting advice on technological issues from the Scientific and Technical Advisory Panel (STAP). The leader of the CP Project was appointed to be the chief of the adaptation policy study at STAP, and he chaired the brainstorming sessions and workshops which gathered together experts, including the chairman of the UNFCCC Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technological Advice (SBSTA) at that time. The report of the workshop was submitted to the GEF.

In December 2002, the project organised a capacity-building workshop that included adaptation policy for developing countries, and conducted a training programme for policy-makers from Cambodia, Laos, and Vietnam. Since adaptation to climate change is often site-specific, the importance of local knowledge in designing relevant adaptation policies can't be overstated. Initial research along these lines on ways to shift the paradigm of adaptation policy from the present "top-down approach" to the "bottom-up participatory approach" was presented at the 12th Asia-Pacific Seminar on Climate Change (Bangkok, Thailand, July 2002).

A field survey was conducted in Bangladesh in July and August 2003 to examine the utility of local assessments of vulnerability and identify ways to integrate indigenous knowledge in climate change adaptation plans. Findings from this survey were recently presented at the Open Meeting of the International Human Dimensions Programme (IHDP) held in Montreal in October 2003. A summary of the presentation was published in a recent *IHDP Newsletter* (04/2003). As mountain ecosystems are one of the highly vulnerable regions affected by climate change, an international workshop entitled "Adaptation to Climate Change in Mountain Ecosystems: Bridging Research and Policy" was held in March 2004 in Kathmandu, Nepal. Our researchers made a presentation on approaches to integrate local knowledge into adaptation policies. As part of collaboration with IGES' RISPO (Research on Innovative and Strategic Policy Options) sub-project of the LTP (Long-Term

Perspectives and Policy Integration), several indigenous practices aimed at enhancing adaptation to climate extremes (droughts, floods, and sea level rise) were identified.

In the later part of the second phase, our researchers began to look at governance issues.[14] For example, one of our visiting researchers looked at the global climate change regime building process and its relation to domestic capacity and regional organisation, and a report based on his work was published in a book.[15] As per COP guidelines, discussions on the creation of an international framework applicable after the Kyoto Protocol are supposed to start in 2005, and many people have already started such research. Although this issue will be the main research theme for the third phase, basic research was initiated in fiscal year (FY) 2003. We conducted an open symposium for Japanese stakeholders and an informal expert consultation on post-Kyoto issues in Tokyo in October 2003. The symposium was well attended by over 300 participants representing various sectors of society. In order to publicise our research and establish a cooperative research framework with various organisations, we organised a side event at COP9 in Milan entitled "Climate Regime beyond 2012: Incentives for Everyone." At this event, we released a preliminary publication on the incentives for global participation in collaboration with NIES.[16] Six out of eight reports in this publication were prepared by our researchers. Our researchers, in collaboration with NIES, published a summary report on important side events related to post-Kyoto discussions held at COP9.[17] As part of our discussions with U.S.-based think tanks (e.g., Resources for the Future), we jointly organised a U.S.–Japan workshop on post-Kyoto issues in February 2004. At the request of Japan's MOE, our researchers provided relevant data, information digests, and other summary reports as a base for discussions on post-Kyoto issues by the Global Environmental Committee of the Central Environmental Council.

Photo 2. COP9 side event "Climate Regime beyond 2012: Incentives for Everyone" (Milan, Italy. 3 December 2003)

14 Kanie, N. 2003. "Johannesburg Summit and Governance for Sustainable Development." *Environmental Research Quarterly*, Vol. 128, pp.37–44; Kanie, N and Haas, P.M. eds. 2004 (in press). Emerging Forces in Environmental Governance. United Nations University Press: Tokyo.

15 Kanie, N. 2003. "Domestic Capacity, Regional Organization and Global Climate Change Regime Building Process," in Michael Faure, Joyeeta Gupta and Andries Nentjes eds., *Institutions and instruments to control climate change: Kyoto and after*. Edward Elgar: U.K.

16 IGES-NIES. 2003. Climate Regime beyond 2012: Incentives for global participation.

17 Kameyama, Y. and K. Tamura (eds.) 2004. Summary report on COP9 side events related to post-Kyoto climate policy architecture. 16pp. (in Japanese).

Significant progress was also seen in terms of strengthening partnerships with other institutions working on post-Kyoto issues. For instance, our researchers participated in discussions led by the Stockholm International Institute (SEI) and contributed to a joint proposal on post-Kyoto issues submitted by 15 organisations to the Swedish Ministry of Environment.

1.2.4. Others

Several commissioned works were undertaken at the request of various ministries in Japan.

Compliance issues: Despite the adoption of the Bonn Agreement and Marrakech Accords, which both include compliance mechanisms and procedures, parties have different views on the nature of compliance mechanisms and procedures (legally binding or not). Since the definition of legally binding compliance procedures is diverse even among international law scholars, Japan's Ministry of Environment (MOE) requested IGES to prepare a report in order to help Japanese policy-makers negotiate better on this issue, and the findings of the work were summarised in a report.[18]

Environmental information disclosure: On 30 October 2001, the Aarhus Convention on access to information, public participation in decision-making, and access to justice on environmental issues came into force. It would result in a change of information disclosure laws on environmental issues in countries ratifying the Convention. Responding to the awareness on information disclosure on environmental issues raised by the Aarhus Convention (UNECE Convention), the MOE requested IGES to examine the current information disclosure laws in major countries, including the United States, Germany, and Japan, and the findings of the work were summarised in a report.[19]

In addition, at the request of the MOE, several reports were compiled to assist Japanese policy-makers (e.g., Framework for Creation of a National Registry in Japan under the Kyoto Protocol [2002]; Achievements of WSSD with Regard to Climate Change [March 2003]; Prospects of Domestic Climate Change Policy in Japan, [March 2003]; Current Status of International Negotiations on Climate Policy: UNFCCC Achievements [March 2003]). At the request of the Ministry of Agriculture, Forestry and Fisheries of Japan, training course materials on the CDM related to afforestation/reforestation were prepared. And as part of the commissioned work from the Ministry of Education, Science and Technology, our researchers prepared a comprehensive review of domestic emissions trading in the U.K.

1.3. Degree of attainment of the objectives

Most of the objectives set at the beginning of this phase were accomplished in all sub-themes. However, progress was inadequate in areas such as the role of Japanese businesses and GHG inventory aspects. Reasons for the inadequate progress were already discussed in Section 1.2. In some areas such as post-Kyoto issues, however, progress was beyond original expectations—leading to the creation of a sound framework for further research in the third phase.

2. Self-evaluation of the project

2.1. Evaluation of achievements

2.1.1. Impact on the policy formulation process

The CP Project disseminated its research outputs and outcomes and influenced policy both directly and indirectly through various domestic and foreign channels in different ways. The research was reported to an academic

18 A report of study group concerning compliance procedures and mechanisms for the Kyoto Protocol (2003) Ministry of Environment.

19 A report of study group concerning environmental information disclosure (2003) Ministry of Environment.

audience via papers in relevant journals and to a stakeholder audience via reports, workshops, and contacts with policy-makers. One major opportunity for the CP Project to influence policy research in Japan is through Prof. Akio Morishima, the Chair of the IGES Board of Directors, and Shuzo Nishioka, CP Project Leader. Prof. Morishima is also the chairman of the Central Environment Council and plays a leading role in formulation of Japan's climate policy. Based on thorough discussions with our research staff members at regular intervals, both the chair and the project leader not only direct research of our members but also convey specific outcomes of our research to various policy discussions held in Japan and internationally. Both of them attend not only the IGES Climate Policy Dialogues held in various Asian countries but also important international conferences held by organisations such as the UNFCCC, Association of Southeast Asian Nations (ASEAN), United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), and the Asia-Pacific Forum for Environment and Development (APFED). Through such activities, the outputs of our research are strongly reflected in policy decisions.

As a member of the Central Environment Council, Dr. Shuzo Nishioka, Climate Policy Project Leader, also actively makes recommendations to its Earth Environment Sub-Committee based on IGES research. He chaired the Sub-Committee for the Investigation of Greenhouse Gas Reduction Scenario and analysed the technical potential of Japan to achieve the Kyoto Protocol's target, which became the basis of another report entitled "Re-examination of Guidelines of Measures to Prevent Global Warming" (2002). Dr. Nishioka gave a private one-hour briefing to Japanese Prime Minister Mr. Koizumi, prior to his meeting with U.S. President George Bush, on scientific and policy aspects of global warming and the stance that Japan should take in future. After his meeting with the president, the prime minister stated in an interview that he was able to clearly explain Japan's stance to President Bush. As chief of the policy research group of Climate Change Research Initiatives, which was set up under the Council for Science and Technology Policy, where Prime Minister Koizumi serves as chairman, Dr. Nishioka organised a dialogue between policy-makers and researchers. At the international level, Dr. Nishioka took the lead in designing climate change adaptation policies as a member of the Scientific and Technical Advisory Panel (STAP) of the GEF, and contributed to discussions on effective ways to use the International Environmental Funds. These activities were partly based on our research.

Research by the CP Project is action-oriented, in that it not only promotes research but also uses research outcomes to actively participate in decision processes to prevent global warming and to promote formulation of appropriate policies. For instance, our project staff participated in a number of research committees of the Ministry of Environment, Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, Ministry of Agriculture, Forestry and Fisheries, and research groups hosted by industrial circles, where they presented their research.

The project regularly holds a seminar after COP meetings and publishes an interim analysis of international climate policy. Moreover, the IGES Climate Policy Open Forum, which always receives over 150 participants, including policy-makers, researchers, industrial circles, and non-profit organisations, is now recognised as an established forum in Japan to exchange diverse views on climate policy.

At the request of Japan's Ministry of Foreign Affairs, the CP Project organised an informal meeting of climate change experts in 2002, using its close network of researchers and policy-makers. Our presentations and discussions at the workshop were highly valued by one and all. Internationally, too, the CP Project held five policy dialogues targeting various Asian nations and deepened the understanding of policy-makers in developing countries toward climate change, thereby contributing to capacity building in the region. Many researchers and policy-makers in the region informed us that the discussions at these dialogues were helpful in formulating their own domestic policies. For example, we understood that our dialogues in Korea helped their negotiators fully examine the implications of unilateral CDM and prospects for setting dynamic targets for developing countries.

Our researchers participated in discussions on post-Kyoto issues with several policy-makers. Although research on these issues will be mainly conducted in the third phase, our staff provided concrete suggestions on ways to

engage various countries in different ways in order to ultimately achieve global participation in the climate regime. As the CDM is now entering the implementation phase, our researchers have recently designed a framework for a three-year capacity-building programme for the CDM in Asia at the MOE's request. Many international organisations and institutes in Asia expressed interest in collaborating on this initiative. The CP Project thus disseminated its research and influenced policy through various foreign and domestic channels in different ways.

2.1.2. Response to research needs

The CP Project conducted several side events at each COP meeting of the UNFCCC and these events were well attended by policy-makers, negotiators, and researchers. Our staff also contributed to discussions of associations such as RINGO, of which IGES is a member. This project has promptly provided useful and practical information for policy formulation by tackling cutting-edge issues in cooperation with various organisations. Internationally, the project follows the discussions at COP/SBSTA/SBI meetings, and always sets up future-oriented research topics (e.g., post-Kyoto issues) in close collaboration with policy-makers. At the request of the Japanese government, the project researchers served as members of the Japanese delegation at COP and took charge of some UNFCCC negotiations as representatives of the country. The researchers also disseminated their knowledge on climate policy in response to the needs of business circles or local governments and held talks regularly with MOE policy-makers, and they established a system that can conduct research on priority issues at any time. As well, a system to facilitate quick action in response to research needs was firmly established.

2.1.3. Originality, creativity, and effectiveness

The main characteristic of the CP Project's research is its integrative, strategic, and action-oriented research style, which takes into account the rapidly changing trends and developments in international climate policy. The research targets of the project are set in accordance with the COP schedule. The project also promotes activities to advance policy formulation and identify new research needs through organising various interactive meetings and workshops.

The merit of an independent research organisation such as IGES is its ability to promote interdisciplinary research and make recommendations that can integrate the policies of individual government agencies (for example, the package proposal on domestic policy measures is one form of its research outcomes). The CP Project has thus established a niche and comparative advantage as one of the major environmental policy research units in Asia.

2.2. Evaluation of project management

During this phase, the project made headway in all five critical aspects of project management: team competence, project effectiveness (in terms of cost, time, and quality), implementation planning, end-user satisfaction, and risk management. One of the characteristics of our team members is diversity of expertise and adequate representation of both natural and social sciences. Team formulation, alignment, and coordination to achieve the project goals have been satisfactory. Discussions with various stakeholders of our research indicated that most stakeholders were satisfied with our achievements. The strong interest expressed by various organisations both in Asia and other continents to collaborate with us is an indication of their satisfaction. The project also made progress in terms of creating a project management framework that yields high performance with a quality service to its stakeholders in the long run.

The CP Project seems to have met up to 80 percent of its original objectives. It initially planned to undertake research on the promotion of policies for the business/industry sectors for prevention of global warming, but could not complete it due to lack of suitable manpower. IGES' Kansai Centre is now taking up this research by focusing on environmental management in business enterprises.

Human resource efficiency was about 90 percent. Personnel changes were severe during this phase, as one researcher joined the United Nations Environment Programme (Paris), another took up a position at a university, and a leading senior researcher became an independent consultant in the middle of the phase. However, a few new researchers were hired later in the phase, and they are performing well and producing good results.

Regarding results from an academic viewpoint, the research performance was not adequate. The submission of one or two papers to academic journals in a year is usually encouraged; but activities such as workshop presentations kept everyone busy, so few results were put into paper form. On the other hand, in regard to our contributions to policy promotion, the accomplishment rate was 90 percent.

The CP Project made intensive efforts to acquire external funding in this phase. In total, the project received nearly 105 million yen from external sources out of a total budget of 401 million yen for the entire phase. For example, the project received a research grant from Japan's Ministry of Education, Culture, Sports, Science and Technology (about 8 million yen each year from 2000–2003, Design of Kyoto Mechanisms), the Asia-Pacific Network for Global Change Research (APN) (about 6 million yen each year for 2000 and 2001, North Asia Regional Cooperation), and the Ministry of Environment (about 8 million yen each year from 1999–2001, Asia GHG Inventory). In 2003, we received another three-year competitive grant from the MOE for joint IGES-NIES research on post-Kyoto issues (IGES allocation is about 7 out of 26 million yen each year). There are many other research grants for IGES on climate change besides these research funds, and they are managed by the General Affairs Department. For example, IGES received funding from the Ministry of Foreign Affairs for organising the "Informal Meeting of Climate Change Experts."

In addition, many other joint outreach activities (e.g., climate policy dialogues, capacity-building workshop in Cambodia, workshops on climate change and sustainable development held in Korea) were supported by funds from other organisations such as UNEP-RISO, Korea Environment Institute (KEI), and others. These contributions were not reported, as they were mainly for joint activities in other countries. In-kind contributions from several developing country institutions in Asia were also received, but these are difficult to valuate in pure economic terms.

All in all, it is no idle boast to claim that the CP Project may be considered as IGES' "flagship" project. During this phase, the CP Project's profile has grown significantly in Japan and in the international community, particularly in the areas of climate policy dialogues and international cooperation. Our staff successfully provided policy inputs to both domestic and international climate policy discussions on various matters; for instance, Japan's domestic policies, the technical and methodological issues related to the Kyoto Mechanisms, international cooperation, and capacity building. Gradually, our staff members are getting involved in proposing joint initiatives with partners in other institutions around the world.

3. Conclusion

The main purposes of our work in this phase were to propose a coherent and comprehensive policy mix for Japan to attain the Kyoto targets, identify effective measures for promoting international cooperation in Asian climate policy, and lay the foundation for further work on post-Kyoto issues and adaptation policies. Substantial progress was made in meeting all these goals. Our research showed that Japan needs to implement a broad portfolio of measures and policies step-by-step to achieve both cost effectiveness and environmental efficiency. In terms of international cooperation, our work showed that further work on implementation issues of the CDM, including capacity building, is critical. Through conducting a number of workshops and policy dialogues, our project was successful in raising the general awareness and knowledge among planners and policy-makers on climate change-related issues in the region and, subsequently, a regard for such issues in policy-making and development planning of the various sectors. Besides stimulating discussions among policy-makers, industry, the general

public, and other stakeholders, our workshops contributed to promoting public knowledge of policy issues and options in Asia.

Our work on vulnerability issues showed that several policy options could be built with bottom-up approaches, wherein local knowledge could be integrated with adaptation policies. The work on post-Kyoto issues demonstrated the urgency and need for identifying critical incentives necessary to achieve global participation in the future climate regime. Our work also strengthened the existing collaborations and institutional networks, and contributed to both institutional and individual capacity building in the region. A self-assessment of key performance indicators of the project (timeliness, response to stakeholder needs, completion of planned activities, attainment of outputs, impacts on local and international policy, and cost performance) showed that the CP Project made satisfactory progress in all areas. The long-term nature of the challenge of climate change indeed requires long-term efforts to design coherent and durable policy options that can maximise environmental protection and sustainable development in Asia. Building on our accomplishments and progress so far, our project is well positioned to contribute to meeting this challenge in future.