

# Report of the Fourth Phase Strategic Research

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June 2010

Institute for Global Environmental Strategies (IGES)



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## Foreword

The Fourth Phase strategic research of IGES started in April 2007 and eight research projects were implemented- Climate Policy, Market Mechanisms, Biofuels, Forest Conservation, Freshwater, Waste and Resources, Business and the Environment, and Capacity Development and Education.

IGES is conducting practical strategic research on global environmental issues to realise sustainable development in the Asia-Pacific region based on a three-year increment strategic research programme. In the First Phase (1998-2000), we made efforts to develop methods of strategic research and to create a basic network for research. For the Second Phase (2001-2003) and Third Phase (2004-2006), we implemented strategic research and at the same time concentrated on ensuring that our research results were reflected more effectively on policy-making, working in collaboration with international organisations and initiatives.

In the Fourth Phase of strategic research, each project carried out research to meet the policy needs of the Asia-Pacific region, while the Programme Management Office (PMO) coordinated the research activities of these projects and carried out cross-cutting studies. By continuing to build associations with diverse international fora and networks, IGES has come to play a leading role in an increasingly active international arena. On the occasion of our 10th Anniversary (2008), IGES proposed a development strategy based on consideration of the climate change issue in an IGES White Paper entitled, "Climate Change Policies in the Asia-Pacific: Re-uniting Climate Change and Sustainable Development" as a culmination of IGES's policy research in the previous years. In 2009, we newly launched the International Forum for Sustainable Asia and the Pacific (ISAP), to conduct wide-ranging discussions on key policy issues facing the Asia-Pacific region. In this manner, IGES has made maximum use of its research networks developed thus far to aggressively disseminate information and offer policy recommendations so that the institute can become actively involved in the dynamically developing area of policy formation related to sustainable development and the environment.

The role of the Asia-Pacific region is becoming more influential in promoting sustainable and low-carbon development. As of April 2010, IGES entered into the Fifth Phase of its strategic research. While further developing our partnerships with a broad range of stakeholders including national governments, local authorities, international organisations, businesses, NGOs, citizens and experts, we intend to dedicate ourselves to implementing multi-dimensional, interdisciplinary research that directly examines the actual problems of the Asia-Pacific region to promote the formation of policies that can contribute to realising sustainable development in the Asia-Pacific region through innovative and strategic policy recommendations.

Finally, I would like to express my sincere gratitude to the Directors, Trustees and members of the Research Advisory Committee for their guidance and advice on the IGES Fourth Phase Research. My heartfelt thanks also go out to all concerned parties for their understanding of and cooperation with our research activities.

June 2010

Prof. Hironori Hamanaka,  
Chair  
Board of Directors  
Institute for Global Environmental Strategies



# **Chapter 1**

## **Overviews of the Fourth Phase Strategic Research**



# Overviews of the Fourth Phase Strategic Research

IGES Secretariat

## 1. Foreword

The Institute for Global Environmental Strategies (IGES), established in 1998 with the support of the Japanese government and Kanagawa Prefecture, has been conducting practical strategic research with the aim of realising sustainable development on a global scale, and particularly in the Asia-Pacific region.

IGES strategic research is conducted based on a three-year research programme using a project method whereby researchers work as a team to conduct collaborative studies on practical research issues.

This report summarises the results of three years of research activities during the Fourth Phase of Strategic Research (2007-2009).

## 2. Fourth Phase Research Projects

Formulation of the Fourth Phase Strategic Research Programme was based on the results of reviews of the Third Phase Strategic Research – a peer review (evaluation by external experts) and an external review (evaluation by the Research Advisory Committee and organisations that are signatories to the IGES Charter). The draft programme was examined by IGES Directors and Trustees as well as by the Advisory Group (AG), which is mainly composed of domestic members of the IGES boards. The implementation of the Programme was then approved at the 21<sup>st</sup> Board of Directors meeting held in February 2007, and research activities were initiated in April of the same year.

In the Fourth Phase, eight projects\* were implemented – Climate Policy, Market Mechanism, Biofuels, Forest Conservation, Freshwater, Waste and Resources, Business and the Environment, and Capacity Development and Education. The Programme Management Office\*\* coordinated the research activities of these projects and promoted cross-cutting research, working steadily to ensure the achievement of anticipated outcomes. Through further building associations with diverse international fora and networks, IGES has come to play a leading role in an increasingly active international arena. We newly assumed the role of knowledge hub on groundwater management of the Asia-Pacific Water Forum's Network of Water KnowledgeHubs, and the secretariat of the International Research Network for Low Carbon Societies, and we have implemented the operation of the Asia Pacific Climate Change Adaptation Network and promoted international joint research related to the 3Rs topic. Further, we released an IGES White Paper that compiles research results to date and launched the International Forum for Sustainable Asia and the Pacific (ISAP). Through such activities, we have disseminated our research results to a broad range of stakeholders, such as policy makers in national governments, businesses, NGOs, citizens and experts. We have also provided highly effective policy recommendations and been actively involved in policy formation on sustainable development and the environment.

\* **Outline of each project in the Fourth Phase**  
(Extracts from *“Integrative Strategic Research Programme of IGES for the Fourth Phase”*)

***Climate Change Policy Area***

Climate change continues to be the highest IGES research priority. There are two research projects proposed in this area.

***(i) “Climate Change Policies in Asia in the context of International Climate Regime” (Climate Policy project)***

The first project is basically a continuation of the current climate change project. Clear focus will be placed on developing countries in the region. Policies to implement CDM (conducted by Market Mechanism Project from FY2008) and to facilitate adaptation to climate change will be examined. In addition, ways and means to enable the region to play a proactive role in designing a post-2012 climate regime will be identified, and measures to facilitate effective climate change policies by looking at co-benefits in key sectors will be analysed.

***(ii) “Sustainable Use of Biofuels in Transport in Asia: Policy Implications and Options” (Biofuels project)***

This project is new and will focus upon biofuels. In response to the recent increase in oil prices and continuous efforts to reduce greenhouse gas (GHG) emissions, many countries have taken, or are in the process of taking measures to promote biofuels. This research will propose innovative ways, both at national and regional levels, to promote environmentally sound production and consumption of biofuels in the region and analyse the extent to which GHGs could be reduced.

***Forest Conservation Area***

The proposed research, *“Forest Conservation, Livelihoods and Rights”* (Forest Conservation project), extends the current IGES research on forest management to include emerging issues in the region. The six components of this research cover forest regulatory regimes, alternative livelihood creation, forest certification seen from both the supply and the demand side, public timber procurement policies and enhancing the role of border control agencies to curb the illegal wood trade. Considerable effort has been made to secure external funds and to design and implement the research components with the collaboration of other research/developmental institutions that have complementary expertise.

***Water Resource Management Area***

The proposed research entitled *“Enhancing Access to Safe Water through Innovative Water Quality Management”* (Freshwater project) has two focuses. The first one is to address deficiencies of the current water quality management policy framework in urban areas of the region, and the second focus is the ground water quality management for increasing available safe water sources. The second component is an extension of what has been completed in the Third Phase.

***Urban Environment Management (Waste and Resources) Area***

The project proposed for this new area is *“Integrated Waste Management and Resource Efficiency”* (Waste and Resources project). There are four focuses. The first component will examine effective strategies to help formalise the informal waste management practices in developing countries. The second component will examine applicability of the eco-town approach to selected countries in the region. The third component will examine in detail how the Extended Producers Responsibility can be introduced in countries in the region in ways that have fully taken into account local social and economic conditions. The last component will examine how the precautionary principle can be adopted in developing countries in Asia and the Pacific, given the global initiative to promote sound chemicals management.

***Business and the Environment Area***

The proposed project, “Pro-active Policies and Business Strategies for Strengthening Corporate Environmental Management in Developing Asia” (Business and the Environment project), will examine how business needs to operate amid changing environmental demand, and what kind of policies would help strengthen corporate environmental management in developing countries in the region. This project will be conducted in close coordination with related components of other research projects. The related components are as follows. The Climate Policy project assesses the role of Asian businesses and industries, in terms of their meaningful participation in the global carbon market, not only under the current Kyoto regime but also under the post-2012 regime. Further, the Forest Conservation project will work with small forest enterprises in developing countries to assess the effectiveness of forest certification schemes.

***Capacity Development and Education Area***

The proposed project entitled “Capacity Development and Education for Sustainable Development” (Capacity Development and Education project) will detail the sequence of information and knowledge acquisition, people’s perceptual and behavioral changes, and their impacts on environmental performance. It gives particular focus to the elements that are expected to catalyse the enhancement of education and capacity development, namely (i) environmental education, (ii) access to information, and (iii) stakeholders involvement. This project will be also conducted in close coordination with related components of other research projects. The related components are as follows. The Freshwater project, for example, looks at the roles of relevant stakeholders in implementing conventional water pollution control systems, and investigates a system to motivate these stakeholders to take effective actions. The Climate Policy project aims to strengthen human and institutional capacity for effective implementation of CDM in selected Asian countries.

\*\* Please refer to p.115 for further details on the activities of Programme Management Office.



# **Chapter 2**

## **Research Activities**



# Climate Policy Project

## 1. Adaptation

### 1.1 Objectives

The main objective of this component was to enhance the adaptive capacity of vulnerable communities through recommending ways to mainstream adaptation concerns in development planning of agriculture and water sectors at local and national levels.

### 1.2 Major Findings

#### ***Mainstreaming adaptation into development:***

- Effective mainstreaming of adaptation concerns into development happens through making available vulnerability assessments at scales where the mainstreaming has to happen.
- There is a considerable need for reforming the developmental governance through streamlining procedures and inter-agency coordination and changing the mindset from short-term planning to long-term endeavours, etc.
- Establishing a context is an essential prerequisite for mainstreaming. This could happen either through designing adaptation goals similar to developmental goals or establishing adaptation roadmaps at various levels and most importantly at the local level.
- Creating an environment for incentives is another important prerequisite for effective mainstreaming of adaptation concerns into development. The incentives can come in the form of risk insurance (the more it is mainstreamed the less the insurance premium) and the presence of international drivers (such as activities funded under UNFCCC).
- There are already experiences in mainstreaming (e.g. environment and disaster risk reduction) and learning from these experiences can expedite the process of mainstreaming.
- Ultimately, there is a considerable need for education and capacity building at all levels for stakeholders to understand and internalise the process of mainstreaming.

#### ***Adaptation metrics:***

- Adaptation metrics are useful in several ways, as they help to (a) identify the most promising adaptation options, (b) prioritise sectors, regions and locations for adaptation funding, and (c) monitor progress in responding to the adverse impacts of climate change. Metrics are also crucial to compare adaptation efforts across countries as well as to assess compliance, especially when such countries receive adaptation funds under the international climate regime. Allocation of adaptation funds by the Adaptation Fund Board may be easier if quantitative adaptation metrics can be developed quickly.
- Diverse perspectives of different stakeholders on adaptation and its components make it difficult to assess progress using a few indicators, especially at high spatial scales such as the

national level.

- There are many methodological challenges in the development of adaptation metrics. There is no consensus yet on whether approaches should be deductive or inductive, locally-specific or spatially-scalable, or based on past experiences or linked to future projections.
- An optimal mix of qualitative and quantitative metrics is perhaps more important than one type of measure. Qualitative indicators may be especially useful in data-poor regions.
- Adaptation metrics should be policy-relevant, scalable, transferable, context-specific and comparable. Metrics should also capture the multi-dimensional nature of adaptation.
- Metrics in the agriculture and water sectors could be complex due to the complex interaction of social, economic and environmental factors. Metrics should be used to measure the adaptive capacity of people as well as policies and institutions.
- Evidence from questionnaire surveys, field surveys and expert consultations showed that there is a great demand for adaptation metrics from a diverse range of stakeholders.
- Respondents to the IGES questionnaire noted that metrics are useful at various stages of adaptation planning, including design of adaptation policies (50 percent) and in ex-ante evaluation of adaptation options (27 percent). The majority of respondents expressed the need for measurable 'adaptation targets' in order for adaptation metrics to be useful (84 percent).
- Many stakeholders agreed that no single metric can capture the multiple dimensions of adaptation. Effective use of adaptation metrics requires that methodological challenges including data limitations are addressed, especially in developing countries. Further refinements of methodologies to develop metrics, including aggregation methods, are necessary.

### **1.3 Impacts Created: Inputs into Major Policy Processes**

Input to the COP/MOP processes under UNFCCC: The Institute for Global Environmental Strategies and the World Resources Institute (WRI) held an IGES-WRI side event entitled "Measuring the Effectiveness of Adaptation: Implications for Climate Negotiations" at UNFCCC COP14 & COP/MOP4 (5 December 2008, Poznan International Fair, Poznan).

Input to the Dhaka Declaration on food security and climate change: Prabhakar, S.V.R.K and Srinivasan, A. 2008. Metrics for Measuring Adaptation to Climate Change in Agriculture Sector. Paper presented at International Symposium on Climate Change and Food Security in South Asia, Dhaka, Bangladesh. 25-30 August 2008.

### **1.4 List of Publications**

- Nguyen, H., Prabhakar, S.V.R.K., and Shaw, R. 2009. Adaptive Drought Risk Reduction in Cambodia: Reality, Perceptions and Strategies. *Environmental Hazards* 8(4): 245-262.
- Prabhakar, S.V.R.K. 2009. Climate Change-Proof Disaster Risk Reduction: Prospects and Challenges for Developing Countries. In *Natural and Man-Made Disasters: Hazards, Preparedness and Mitigation*, edited by M.K. Jha. 22. Netherlands. Springer.
- Prabhakar, S.V.R.K. 2010. Promoting adaptation in the post-Kyoto Regime. In R. Shaw, J. Pulhin, and J. Pereira, (eds.), *Climate change adaptation and disaster risk reduction*, Emerald Publishers, UK.
- Prabhakar, S.V.R.K. and Srinivasan, A. 2008. "Climate change risk reduction: decision making in uncertainty." In R. Shaw and R.R. Krishnamurthy (eds.) *Disaster management: Global challenges and local solutions*, 159-183. Chennai, India. Universities Press India Limited.

- Prabhakar, S.V.R.K. and Srinivasan, A. 2009. Metrics for Mainstreaming Adaptation in Agriculture Sector. In *Climate Change and Food Security in South Asia*, edited by M. Lal. 25. USA. Ohio State University, World Meteorological Organization, and Springer Ltd.
- Prabhakar, S.V.R.K. and Md. Parwez, S. 2009. Participatory Information Management for Sustainable Disaster Risk Reduction. In *Natural and Man-Made Disasters: Hazards, Preparedness and Mitigation*, edited by M.K. Jha. 22. Netherlands. Springer.
- Prabhakar, S.V.R.K., Srinivasan, A. and Shaw, R. 2008. "Climate change and local level disaster risk reduction planning: need, opportunities and challenges." *Mitigation and Adaptation Strategies for Global Change*. 10.1007/s11027-008-9147-4.
- Prabhakar, S.V.R.K. 2007/11. Climate Change Implications for Sustainable Development: Need for Holistic and Inclusive Policies in Agriculture, Land, Rural Development, Desertification, and Drought. Bangkok. UNESCAP.
- Srinivasan, A and Prabhakar, S.V.R.K. 2009. Measures of Adaptation to Climatic Change and Variability (*Adaptation Metrics*). An IGES Research Report submitted to the World Bank. Institute for Global Environmental Strategies and the World Bank.
- Proceedings of "The Expert Consultation on Adaptation Metrics", Organised by The Institute for Global Environmental Strategies (IGES), in cooperation with the World Bank, in Tokyo (17-18 April 2008).

## 2. Post-2012 Climate Regime

### 2.1 Objectives

The main objective of this component was to engage Asian developing countries proactively in framing the future climate regime through identifying suitable means to reflect their concerns and developmental aspirations more adequately than before. A series of policy dialogues were held to make concrete recommendations for crafting an equitable and inclusive future climate regime that is aligned more closely with the development aspirations of countries in the region.

### 2.2 Major Findings

A series of policy dialogues and expert consultations were held to bring together a diverse range of stakeholders to key elements of the future climate regime. These themes included sectoral approaches, financing and governing adaptation, investment and financial flows, technology, Reducing Emissions from Deforestation and Degradation (REDD), co-benefit approach, biofuels in the future climate regime, inventories, governance of the post-2012 financial mechanism, and a "measurable, reportable and verifiable (MRV)" framework. For each theme, we arrived at four or five recommendations. The themes and their corresponding recommendations follow.

#### **Sectoral Approaches**

- Sectoral approaches should be associated with stringent and deep quantitative national reduction targets by developed countries and a concrete mechanism to support actions by developing countries.
- Given divergent views on sectoral approaches, sectoral actions should be initially piloted on a limited scale. For example, while sector-wide participation should be required in sectors with significant emission reduction potentials in developed countries, a sub-group of firms (for

instance, new and/or efficient ones or multinational enterprises) should be required to participate from developing countries.

- Additional and specific revenue streams should be established to support activities of developing countries' entities involved.
- Participating entities in developing countries should be allowed to make progressive improvements in technology uptakes and energy efficiency.
- Any agreement on technology standards under sectoral approaches should be notified to the WTO Agreement on Technical Barriers to Trade, to secure international transparency in adoption of standard systems.

### ***Financing and Governing Adaptation and Promoting Disaster Risk Reduction***

The future climate regime should:

- Make sure that adaptation concerns are mainstreamed into developmental planning at various levels and that adaptation should not be treated separate from development.
- Establish a framework that mobilises new and innovative financial resources, that goes beyond current proposals including private and public or that builds synergies among different sources of funds.
- Lead to funding mechanisms that meet criteria such as adequacy, predictability, additionality, and sustainability with vulnerable countries having larger stakes in its management and ownership.
- Establish a mechanism wherein countries are differentiated according to their vulnerabilities which could have favourable results in the future adaptation framework.
- Establish a governance mechanism that enforces measuring, reporting and verification of adaptation actions.
- Build synergies between the United Nations Framework Convention on Climate Change (UNFCCC) and disaster risk reduction initiatives by effective sharing of knowledge and resources.

### ***Investment and financial flows***

Climate negotiators should:

- Explore viable options for market-based, self-generating sources of revenue to scale-up finance, meeting the criteria of additionality, adequacy, predictability, appropriateness and equity.
- Seek all party contributions to scale-up based on the principle of "common but differentiated responsibilities".
- Explore and reach a consensus on the criteria for burden sharing; i.e. current circumstances, future potential growth, or historic responsibility.
- Implement various policy tools and regulations to incentivise private investment, including feed-in-tariffs, and subsidies to research and development (R&D) for clean, low carbon technologies.
- Establish and expand basic carbon market infrastructure to realise the full value of carbon.
- Improve capacity of the Global Environmental Facility (GEF) in responding to the diverse needs of developing countries, using the Adaptation Fund Board and its operating principles as a model for governance.
- Ensure coherence among external funds as well as with funds under the UNFCCC Framework.

## ***Technology Issues***

- A strengthened technology funding mechanism through scaling up of, and improvement in the access of funds is necessary. Developing country participants are of the view that new and additional funds for this mechanism should be secured from a combination of assessed contributions from Annex II Parties, and a levy on international transactions of carbon credits. Developed country participants on the other hand, have stressed the efficient use of funds—both existing and new. Effective governance of the proposed technology funding mechanism may be assured through a balanced representation of developed and developing country Parties, and a transparent operating procedure in coordinating all technology-related activities of developing countries.
- Participants broadly recognised a clearly defined role of governments as key catalysts of private investment and financial flows and as main drivers of technology transfer of environmentally sound technologies (ESTs). Domestic policies will be critical in creating and sustaining enabling environments for the transfer and diffusion of key ESTs. The “right” policy mix and incentives to support each stage of the technology transfer process will vary per country keeping in mind the diversity in socio-economic and political conditions, the sector involved, and the technology concerned.
- A more flexible IPR regime, which reflects a more balancing-of-rights approach supporting innovators on one hand, and facilitating the development and transfer of key climate-relevant technologies on the other, should be examined. At the same time, funding mechanisms that support EST transfer should look into strengthening national regulatory structures that will attract and channel investments into ESTs.
- Participants broadly agreed on the need for a set of uniform indicators for technology development and transfer. Key effective performance indicators of technology transfer through technology needs assessment (TNA) and actions undertaken by governments to enhance the enabling environments by recipient developing countries, as well as actions taken by developed countries, should be adopted. Based on those indicators, performance should be measured, verified and reported in the National Communications of both developed and developing country Parties.

## ***Reducing Emissions from Deforestation and Degradation (REDD)***

For developing Asian countries

- Explore piloting in different forest categories under different forms of management facing different drivers of deforestation and forest degradation, and at different scales, to maximise learning.
- Establish a regional forum to share lessons and experiences on national REDD preparations and pilots.
- Explore how flexible and transitional approaches could accommodate the interests and concerns of each country, while providing opportunities for other Parties to participate fully in REDD and maximising the potential of REDD to contribute to climate change mitigation.

For climate negotiators and the UNFCCC

- Provide fora for focused discussion on the three key issues – scope, level of implementation, funding – to facilitate decisions on these issues.
- Organise workshops with the intergovernmental forest organisations – United Nations Forum

on Forests (UNFF), Food and Agriculture Organization of the United Nations (FAO), International Tropical Timber Organisation (ITTO) – and other key stakeholders with the objective of clarifying the roles of each organisation, to avoid duplication of effort and to maximise synergies with respect to forests and climate.

- Pay greater attention to designing an international REDD mechanism that requires informed multi-stakeholder participation in the development and implementation of national and local REDD strategies.

### ***Co-benefit approach***

In the short-term (post-2012), climate negotiators should consider:

- Expanding the scope of the CDM (with due concern for environmental integrity).
- Simplifying CDM approval requirements for development-friendly actions.
- Adopting a list of development-friendly actions and/or developing countries qualifying for preferential treatment.
- Strengthening the capacity of the CDM Executive Board to coordinate ODA and carbon finance.

In the long-term (post-2020), climate negotiators should consider:

- Graduating some major developing countries to firmer pledge-based commitments.
- Creating multiplication factors for actions with co-benefits.
- Standardising co-benefits criteria to determine which actions qualify for preferential treatment.
- Using standardised criteria to determine which actions qualify for ODA, carbon finance, or both.

### ***Biofuels in the future climate regime***

The future climate regime should:

- Create incentives to promote only those biofuel projects and programmes that provide net positive energy, environment, and developmental benefits.
- Institute necessary safeguards including mandatory Life Cycle Assessments (LCAs) for sustainability impact of biofuels from production to consumption with the boundary extended to include impacts on water, forests, and biodiversity.
- Develop additional methodologies for promoting future biomass programmes under CDM and REDD schemes.
- Mobilise financial and technological resources for the production and consumption of second generation biofuels.
- Establish a mechanism for coordinated energy policies that brings together the developed and developing countries.

### ***Inventories***

- All Parties should routinely produce inventories. Enhanced opportunities for capacity development and information sharing at the regional level additional to the existing support scheme, exemplified by the Workshop on Greenhouse Gas Inventories in Asia, are steps towards this goal.

- An external review process should be provided for in non-Annex I Parties. A progression from voluntary regional cross-checking to a regular external review for non-Annex I Parties should be considered over time.
- Both Annex I Parties and non-Annex I Parties should report the same gases. To do so, capacity building and technical cooperation for data provision and collection for HFCs, PFCs and SF6 for non-Annex I Parties should be provided.
- The mandate and TOR of the Consultative Group of Experts should be revised with focus on a more substantive role for national communications of non-Annex I Parties.

### ***A “measurable, reportable and verifiable (MRV)” framework***

- The existing GHG inventory system and the National Communications could form the basis for a new framework for measuring and reporting developing countries’ Nationally Appropriate Mitigation Actions (NAMAs) under the future climate regime. Differentiating reporting frequency and content requirements for developed countries, emerging economies, and developing countries should be considered when constructing this new framework.
- To establish a comprehensive verification system and build trust among countries, all GHG reductions from developing country NAMAs should be verified quantitatively. Introducing third-party verification, such as a peer-review system by neighbouring developing countries, could provide a more flexible verification system than the review process used for Annex I Parties. In the interim, developing low carbon, sustainable development strategies would help mainstream climate policies into national development plans and facilitate the monitoring and verification of unilateral NAMAs.
- Building a comprehensive information sharing scheme that improves access to information and registers information on bilateral and multilateral financial aid flows could reduce fragmentation of financial assistance and improve aid effectiveness.
- Strengthening a framework for South-South cooperation, such as exchanging human resources and sharing best practices for NAMAs, is also crucial for developing a comprehensive, effective information sharing scheme on NAMAs and international support. Developing a regional registry for NAMAs would facilitate regional cooperation, and build trust at the regional level through the exchange of best practices and lessons learned.

### ***Governance of the post-2012 financial mechanism***

- Proposals for governing a post-2012 financial mechanism should be evaluated along four criteria: engagement, effectiveness, efficiency and expertise.
- A regional registry system should be established to help administer the matching of NAMAs supported by technology, financing and capacity building, in an MRV manner as defined in the Bali Action Plan (BAP).
- The regional registry could partner with regional development banks such as the Asian Development Bank (ADB) and make use of existing technical networks to facilitate the matching of climate actions and finance.
- The operational entity of the financial mechanisms under the COP to the UNFCCC should oversee and monitor financial flows from regional registries and recommend reforms on issues such as interregional funding imbalances.

## ***Sustainable Low Carbon Development in Asia***

In 2009 we began a new three-year research project on the opportunities, potential and limitations for taking a sustainable low carbon development pathway in developing Asia. The first year of the project focused on these opportunities, potential and limitations in Indonesia. As seen in its leadership role in pledging voluntary emissions reduction targets, Indonesia has exhibited a growing interest in climate actions. Many factors have contributed to this interest, including growing concerns over energy security, awareness of the negative impact of climate change, and a future climate regime that provides financial, technological and capacity building support for REDD+ and NAMAs. It should also be noted that Indonesia has a solid domestic foundation to support climate actions. Key elements of this foundation include the leadership by the Yudhoyono administration; a decentralisation process enabling local governments to introduce innovative policies and actions compatible with local needs; the presence of social entrepreneurs and local research institutions; and the existence of indigenous values and practices to anchor sustainable livelihoods. This foundation also provides Indonesia with a sound basis for absorbing and deploying low carbon technologies. However, there remain various limitations and challenges, such as limited coordination among various stakeholders, fossil fuel subsidies, rich endowments of domestic coal, and the necessity to ensure the food security of a growing population. The chapters in our report on sustainable low carbon development in Indonesia organises the country's potential, opportunities, and limitations to pursue sustainable low carbon development into key sectors—i.e. forestry, transport, energy and agriculture. Each chapter provides possible solutions to overcome important barriers. Traditional values and practices are also examined. Table 1 provides a summary of the argument. Overall the results from the first year of this study suggest that Indonesia is in a good position to achieve sustainable low carbon development, though challenges remain.

### ***2.3 Impacts Created: Inputs into Major Policy Processes***

The outputs of the CP project contributed to a series of Asia-Pacific Dialogues on the Future Climate Regime and the U.S.-Japan workshops on climate change, where the CP played major roles. Other major policy processes to which the outputs of the CP project were useful included international negotiations under the auspices of UNFCCC through holding side events, and the MOE Working Group on the future climate regime, through making our policy-focused assessment of the future climate regime issues available to domestic policymakers. The policy consultation for low carbon development, held in Indonesia, also raised the profile of low carbon development issues among Indonesia policymakers and experts. We also publicised our research outputs to senior Japanese policymakers including the Minister of the Environment.

### ***2.4 List of Publications***

- Fukuda, K. and Eggleston, S. 2008. GHG Inventories. *IGES Briefing Notes on the Post-2012 Climate Regime*. Issue No. 8. Institute for Global Environmental Strategies, Hayama, Japan. pp 1-8.
- Fukuda, K. 2008. Investment and Financial Flows for the Future Climate Regime. *IGES Briefing Notes on the Post-2012 Climate Regime*. Issue No. 3. Institute for Global Environmental Strategies, Hayama, Japan. pp 1-8.
- Fukuda, K. 2009. A "Measurable, Reportable and Verifiable (MRV)" Framework for Developing Countries. *IGES Briefing Notes on the Post-2012 Climate Regime*. Issue No. 10. Institute for Global Environmental Strategies, Hayama, Japan. pp 1-8.

**Table 1: Potentials, opportunities, limitations and solutions for Indonesia's sustainable low carbon development**

	Potentials and Opportunities	Limitations and challenges	Solutions
Forest	<ul style="list-style-type: none"> <li>• Significant mitigation potential</li> <li>• Financial and technical assistance through REDD+</li> </ul>	<ul style="list-style-type: none"> <li>• Technical issues (esp. establishment of realistic reference levels)</li> <li>• Cross-sector policy coordination</li> <li>• Poor forest governance</li> </ul>	<ul style="list-style-type: none"> <li>• Broad reforms to institutional arrangements and strong policy coordination</li> <li>• Involvement of well-informed local actors</li> </ul>
Transport	<ul style="list-style-type: none"> <li>• Policy innovations and experimentation under decentralisation</li> <li>• Co-benefits from low carbon transport policy</li> <li>• International assistance under NAMAs</li> </ul>	<ul style="list-style-type: none"> <li>• Limited financial resources</li> <li>• Lack of coordinating bodies between national and city levels</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening central-local budgeting mechanisms</li> <li>• Creating provincial level transport agencies to promote policy coordination</li> <li>• Capacity building through NAMAs assistance</li> </ul>
Energy (clean coal technology)	<ul style="list-style-type: none"> <li>• Expected changes in primary energy supply</li> <li>• Mitigation potential</li> <li>• Good foundations for a national system of innovation (NSI)</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid expansion of coal use</li> <li>• Lack of coordination among key stakeholders</li> <li>• Lack of financial resources</li> </ul>	<ul style="list-style-type: none"> <li>• Further effort to create functional NSI through better coordination, the provision of incentives and the identification of priority technologies</li> </ul>
Energy (renewable energy: RE)	<ul style="list-style-type: none"> <li>• Rich endowments of renewable energy resources</li> <li>• Underdevelopment of centralised power generation system</li> <li>• Growing concern over energy security</li> <li>• Presence of social entrepreneurs and local research entities</li> </ul>	<ul style="list-style-type: none"> <li>• Financial barriers (relative price competitiveness and access to finance)</li> <li>• Institutional barriers (complexity of permit acquisition and regulatory uncertainty)</li> </ul>	<ul style="list-style-type: none"> <li>• Subsidisation of RE technologies</li> <li>• Assessment and identification of appropriate RE technologies</li> <li>• Education and training facilities</li> <li>• Enhanced information dissemination and award system</li> </ul>
Agriculture	<ul style="list-style-type: none"> <li>• Existence of low and negative cost mitigation technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Need to ensure food security of the growing population</li> <li>• Lack of proper incentives for wider deployment of low carbon technologies</li> <li>• Lack of awareness/ capacity of farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Carbon credits for the agriculture sector</li> <li>• Expansion of climate field schools and farmer field schools</li> <li>• Marginal abatement cost-based decision-making</li> <li>• Subsidising key low carbon technologies</li> </ul>
Values and practices	<ul style="list-style-type: none"> <li>• Existence of indigenous values and practices to anchor sustainable livelihoods</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid economic development and modernisation</li> </ul>	<ul style="list-style-type: none"> <li>• Revitalising local and indigenous values and practices</li> <li>• Carefully examining the applicability of values and practices to the modern context and different localities</li> </ul>

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- Proceedings of "The IGES Policy Forum on Integrating Asia's Concerns on Energy Security into the Post-2012 Climate Regime", Organised by the Institute for Global Environmental Strategies (IGES), co-sponsored by Keimyung University, Republic of Korea and Asian Institute of Technology (AIT), Thailand, in Bangkok (7-8 August 2008).
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### **3. Co-benefits**

#### **3.1 Objectives**

The main objective of this component was to maximise development co-benefits of GHG mitigation policies in key sectors, especially focusing on transportation, agriculture and waste management.

## 3.2 Major Findings

### *Methodological and Socio-political Barriers*

- Programmes supporting the estimation of co-benefits have begun to have an effect on air pollution policies, programmes, and projects in Asia. However, the impacts are still most pronounced in strengthening the capacity of research institutions and universities to generate co-benefit estimates.
- The systematisation of internationally recognised estimation measures and methods is a necessary first step to establish a uniform baseline to compare co-benefit policies. Once such a baseline is established, co-benefit estimates can be tailored to local needs—provided these refined estimates are themselves derived from internationally recognised measures and methods.
- Though cost-benefit analysis is the most frequently used co-benefit estimation technique, it is not the only useful approach; checklists and multi-criteria analysis may be easier to use and less data intensive.
- Since Asia's local governments are becoming more responsible for implementing measures with co-benefits, alternative quantification methods may be needed to complement the data and time-intensive estimation techniques employed in much of the co-benefits literature. Compiling these methods in the form of policy guidelines would enhance their usability for local level policymakers.
- A clear understanding of the system boundaries differentiating local, national, and international benefits will prove helpful in generating consistent and credible co-benefit estimates.
- Future projects on co-benefits should pay attention to on-the-ground realities, including environmental as well as socio-economic benefits that are frequently excluded from co-benefits analyses, and present cost information along with benefit estimates.

### *Transport Co-benefits*

- Developing Asia will need to pursue a low carbon transport (LCT) path that deviates significantly from the two-fold increase in transport related CO<sub>2</sub> projected in most business-as-usual (BAU) scenarios.
- For much of the region this path will incorporate land use, public transport, clean fuel and advanced vehicle technologies into a comprehensive suite of low carbon transport (LCT) measures. This suite of policies and measures will not only need to mitigate GHGs but also reduce air pollution, strengthen energy security, curb congestion and deliver other developmental co-benefits.
- LCT strategies for optimising co-benefits require integrating climate concerns into transport policies and transport concerns into climate negotiations and development assistance programmes.
- The synergies and conflicts between climate actions and local development priorities merit attention in the design of transportation policies, especially for fuel switching measures such as switching from diesel to compressed natural gas (CNG).
- In the short-term, regulating particulate matter (PM) from diesel can offer significant co-benefits. Reducing PM can improve public health and mitigate black carbon, which is a short term warming agent with a high global warming potential (GWP). This will be especially important in Asia's freight and logistics subsector and in countries promoting light duty dieselisation such as India.

- In the medium term, strategies focusing on reducing travel demand have the greatest potential to deliver climate and developmental co-benefits. These strategies will require significantly more financial and capacity building support than is currently being provided domestically and internationally.
- Institutional barriers are particularly evident during the implementation of transport demand issues. Institutional difficulties such as interagency coordination problems are more difficult to overcome than policy design issues.
- Involving the private sector can help overcome some of the financial barriers to LCT strategies with co-benefits in Asia. This is especially important for financing public transport solutions through public and private partnerships.
- To enhance the implementation of LCT strategies with co-benefits, policymakers should seek to minimise adverse impacts on affected groups. Interest groups can often undermine the implementation of these policies if there are not well-defined compensation schemes.
- The future climate regime will need to incentivise a co-benefit approach in the transport sector. Since CO<sub>2</sub> reductions alone are not enough to influence transport policymakers in developing countries, the future climate regime must consider local developmental co-benefits.
- Reforms to the future climate regime that could stimulate a co-benefits approach in the transport sector include creating a transport window in the future climate regime's Copenhagen Climate Green Fund that makes developmental co-benefits one of the eligibility criteria for supported transport-related nationally appropriate mitigation actions (NAMAs).

### **3.3 Impacts Created: Inputs into Major Policy Processes**

The outputs of the CP project contributed to a series of scoping meetings and workshops on co-benefits, including the US-Japan Workshop on the Co-benefits of Climate Policies (2007 and 2008), Better Air Quality Workshop (2008), the International Forum for Sustainable Asia and the Pacific (ISAP) (2009) and a Network Meeting: A Co-benefits Network for Asia and the Pacific (2009). The above Network Meeting was used to support the creation of a Co-benefits Network for Asia that is intended to share information and experiences between organisations and other stakeholders conducting work on co-benefits in Asia. Researchers are also collaborating with a team from Nihon University to develop a manual that includes guidelines and practical examples of how to quantify co-benefits.

### **3.4 List of Publications**

- Tamura, K. "Public Nuisance and Climate Change: Improving Together" *Asahi Shinbun* 14 January 2009. [in Japanese]
- Uchida, T., and Zusman, E. Reconciling Local Sustainable Development Benefits and Global Greenhouse Mitigation in Asia: Research Trends and Needs. *Studies of Regional Policy*, Vol. 11, No. 2008. pp. 57-74.
- Zusman, E. et al (eds) (forthcoming) *Low Carbon Transport in Asia: Strategies for Optimising Co-benefits*. London: Earthscan.
- Proceedings of the "Better Air Quality 2008 Pre-Event on Climate-Friendly Transportation Strategies in Asia: Overcoming Obstacles to Co-benefits", Co-organised by the Ministry of the Environment Japan (MOEJ), and the Institute for Global Environmental Strategies (IGES), in Bangkok, Thailand (11 November 2008). [in Japanese]
- Proceedings of the "United States-Japan Workshop on the Co-benefits of Climate Actions in Asia",

Co-organised by the Ministry of the Environment Japan (MOEJ), the United States Environmental Protection Agency (US EPA), and the Institute for Global Environmental Strategies (IGES), in Bangkok, Thailand (22 April 2008).

Proceedings of the “United States-Japan Workshop on the Co-benefits of Climate Actions in Asia”, Co-organised by the Ministry of the Environment Japan (MOEJ), the United States Environmental Protection Agency (US EPA), and the Institute for Global Environmental Strategies (IGES), in Bangkok, Thailand (22 April 2008). [in Japanese]

#### 4. All IGES activities

Contributions to the draft Third White Paper:

Muzones, M.D., Zusman, E., Ling, F.H., Kimura, H., Kobashi, T., Watabe, A., and Otsuka, T., “Sustainable, Low Carbon Buildings and Transportation: Climate Imperatives in Urbanising Asia” [DRAFT]

##### *Salient points*

1. Managing the consumption of energy services in the buildings and transport sectors will be key for sustainable consumption and low carbon growth in Asia.
2. Government support through subsidies and informational campaigns can help to accelerate deployment and drive economies of scale for energy efficient technologies and practices in the buildings sector.
3. Public works like bus rapid transit (BRT) and district heating and cooling (DHC), which can only be carried out by the government, are critical to energy and fuel efficiencies.

Prabhakar, S.V.R.K., Sano, D., and Srivastava, N., “Food Safety in the Asia-Pacific: Current Status, Policy Perspectives, and Way Forward” [DRAFT]

##### *Salient points*

1. Food safety is an important issue requiring equal attention as that of food quantity and access issues for holistic food security in the Asia-Pacific region.
2. Food safety is an issue of sustainable production and consumption in agriculture since both are linked through a web of feedback connections.
3. Organic agriculture provides an important opportunity to promote food safety while it cannot be a sole answer to the problem due to several limitations.
4. A combination of policies and actions, including harmonisation of food safety standards, policy coordination across relevant ministries, life cycle approaches that bring together various stakeholders, and producer and consumer capacity building, can bring the necessary food security to the region.

#### 5. Self-evaluation

Based on our research and outreach activities over the past twelve years, the Project has established itself as one of the few active research groups focusing on climate policy issues in Asia. An evaluation of the project outcomes against the criteria of policy relevance, effectiveness and efficiency follows below.

### ***(1) Relevance***

Our efforts and outputs made in Phase IV were consistent with the IGES mandate – to provide strategic and pragmatic policy options for sustainable development in the Asia-Pacific. Our foci were on emerging, contentious issues with significant implications for sustainable development in the region, including adaptation, the future climate change regime, and a co-benefits approach. To address these issues, we took into account not only rapidly changing trends and developments in international climate policy, but also a wide range of priorities, interests, and concerns, which were expressed by stakeholders at, for example, our policy dialogues and expert consultations. In terms of inclusion of stakeholders, although our target audience has been primarily policymakers, we made a deliberate effort to consider the views of the private sector, NGOs and academia. These efforts helped to make the Project's activities relevant to the policy needs of various shareholders in the region.

Since climate policy in Japan, the region and the world is rapidly evolving and new issues are emerging daily, it will be necessary to continue strengthening the Project's capability and structure to respond to emerging issues in a timely manner.

### ***(2) Effectiveness***

Despite a high staff turnover during the fourth phase, the Project achieved most of the objectives set out in various components of the Phase IV plan. The project was quite effective in promptly providing practical information for policy formulation on cutting-edge and sometimes controversial issues. It should be noted that the uniqueness of our approach, through which we tried to reflect the interests and concerns of Asian developing countries and reconcile Asian interests with global interests, strengthened the effectiveness of our activities. With regard to the future climate change regime, for example, we selected more than ten important themes, ranging from adaptation to sectoral approaches to financial mechanism to technology transfer to nationally appropriate mitigation actions (NAMAs) to measuring, reporting and verification (MRV) systems. Under each theme, we identified four or five contentious issues, documented various, sometimes conflicting, perspectives on those issues, and made recommendations for reconciling those perspectives. In so doing, we sought to provide policy-relevant solutions that could advance post-2012 climate negotiations. For example, in the case of sectoral approaches, we raised issues such as the implications for trade and technology choices and consistency with the principles of UNFCCC and other Multilateral Environmental Agreements. These issues have not been sufficiently addressed in Asia.

The main feature of our project's research was its action-oriented research style, which included several events and networking. Our efforts in raising the profile of climate policy in Asia through holding multi-stakeholder consultations and information outreach sessions have been widely appreciated. However, one drawback of our action-oriented research is the lack of time and opportunities to generate research outputs meeting high academic standards. We wish to improve upon this area in the next phase, if resources permit.

### ***(3) Efficiency***

The project used all available human and financial resources in an efficient manner. It is important to note that the project suffered from a high staff turnover including the loss of a project manager

during this phase. The Project made great efforts to mobilise existing staff members to come up with the objectives for this Phase as well as recruit talented staff to fill vacancies. In terms of utilisation of financial resources, the Project adopted many cost-cutting approaches without adversely affecting the quality of our research. The Project staff also made several efforts to raise external funds from various domestic and international organisations with a view to reduce our dependence on core funding. However, we realise that further efforts to attract external funding in the future are necessary to maintain momentum from this phase.

#### ***(4) Outputs and Impact Created***

With regard to research outputs on the future climate regime, we published 11 IGES issue briefs on contentious elements of the post-2012 regime, such as MRV, REDD and so on. We also published one commercial book on financial mechanisms for the post-2012 climate regime, and one report based upon our Asia Pacific dialogues on the future climate change regime. Other outputs include more than fifteen book chapters, journal articles, and newspaper articles. We also plan to publish another edited book on low carbon development in Asia. On adaptation, we authored a scoping report on adaptation metrics for the World Bank. The report identified concerns and challenges in measuring adaptation, and provided a way forward for measuring adaptation and for operationalising metrics. We also have three peer-reviewed articles. One discussed the need for adaptation metrics in the agriculture sector and provided a framework for measuring adaptation in that sector. Another provided a framework through which local level climate risk reduction planning could be done in the absence of dependable climate forecasts, and the other set the background for climate risk reduction and reviewed the existing risk reduction mechanisms. The project also published four book chapters and one background paper for the Commission on Sustainable Development. On a co-benefit approach, the project is going to publish one edited book on co-benefits of transportation policies in Asia. The project also had one non-peer-reviewed journal article, which examined the methodological and institutional barriers to integrating co-benefit estimates into policies in developing Asia, and concluded that rapid analytical assessment methods could make co-benefits more policy-relevant. The project also provided advisory services to the Asian Development Bank (ADB) Mini-Stern Review, and UNEP ROAP and the Asian Environmental Compliance and Enforcement Network, Strengthening the Rule of Law to Address Climate Change. In terms of areas for improvement, it will be necessary to evaluate our research outcomes in academic circles to strengthen the quality of our work and the capacity of our staff, and we will need to produce policy papers in a timely fashion.

In terms of impact at the international and regional levels, the Project used an influence strategy of conducting a series of regional and international policy dialogues as well as UNFCCC side events in which we played a major role, and our research outputs contributed to discussions and documents. Our efforts in raising the profile of climate policy in Asia, as well as international climate negotiations, through holding multi-stakeholder consultations and information outreach have been highly appreciated. It is also important to note that conducting dialogues helped us to build a network of regular contributors, including high-level officials such as Ambassador Rae Kwon Chung (Republic of Korea) and Ambassador Adrian Macey (New Zealand). Our expertise based upon the research outputs also contributed to our advisory services to international organisations, such as the World Bank and the ADB, as well as Japan's International Climate Change Programme Loan to Indonesia. At the domestic level, some of the project's staff served as members of the MOE Working Group on the future climate regime and the MOE Study Group on MRV, and their participation made our policy-based assessment of the future climate regime available to domestic policymakers. We also

contributed to an IGES presentation on the Hatoyama Initiative for the Minister of the Environment, Japan and Vice-Ministers, and held a briefing session on financial mechanisms to a Counsellor of the Cabinet Office, who is involved in the UN High-Level Committee. Project members have also been involved in the creation of a “Co-benefit Forum for Asia” and the “Asia Pacific Adaptation Network”.

## 6. Conclusion

Despite high staff turnover during this phase, the project achieved several objectives set out initially through effective and efficient management of available human and financial resources. Our attempt to develop Adaptation Metrics through gathering researchers and experts from Asia and the world was widely appreciated by several stakeholders. Our efforts to find options for integrating adaptation concerns into local and national plans and to enhance the focus of discussions on adaptation at the international level from an Asian perspective were also commended. Our attempts to ascertain Asian concerns and priorities for strengthening the future climate regime and our efforts toward developing a climate regime that adequately reflects Asian interests were highly appreciated by the international community. Likewise, our efforts to identify and promote ways to maximise development co-benefits of GHG mitigation policies in the transportation sector received considerable attention and led to possible collaborations with various other like-minded initiatives.

Based on the above achievements and through active involvement in operations of the IGES Programme Management Office, we contributed to the development of our Phase V plan. The fundamental focus of our Phase V activities is to look into how the basic needs of developing countries in Asia can be appropriately dealt with, while simultaneously promoting low carbon and sustainable development. Specific focuses include: (i) sustainable, low carbon development in Asia, (ii) the post-2012 climate regime, (iii) the institutional design of an MRV (Measuring, Reporting and Verification) system, (iv) a co-benefits approach in Asia; and (v) the International Research Network on Low Carbon Societies (LCS-RNet). It is also important to note that all activities are designed to be linked to important international policy processes with a view toward generating significant policy impacts.

# Market Mechanism Project

## 1. Reforming the CDM to Contribute to Sustainable Development

### 2. Objective

The clean development mechanism (CDM) established under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) is one of the market mechanisms to assist developed countries in complying with their emission reduction targets, as well as to assist developing countries in achieving sustainable development. Since adoption of the Kyoto Protocol at the COP3 in 1997 and enforcement of the Kyoto Protocol in 2005, tremendous efforts have been made to operationalise the CDM by establishing concrete rules and procedures with frequent revisions.

Owing to such efforts, the CDM has made remarkable successes in that it has brought about more than 2,000 CDM projects all over the world, which have been registered by the CDM Executive Board (CDM-EB). These registered CDM projects are expected to bring more than 1.7 billion t-CO<sub>2</sub> equivalent of emission reductions by 2012. However, many criticisms and dissatisfactions have been raised by different stakeholders involved.

For example, unequal geographical distribution of the CDM projects has been observed. In fact, almost 76 percent of CDM projects are hosted in China, India, Brazil, Mexico and the Republic of Korea in terms of number, and almost 84 percent of emission reductions by 2012 will be achieved only by those countries. In comparison, just 0.7 percent of CDM projects are hosted in the Least Developed Countries (LDCs) in terms of number, and emission reductions from these by 2012 accounts for only 0.2 percent.

In addition, some also criticise that CDM projects do not fully assist developing countries in achieving sustainable development. Issues relate to the current CDM governance as well as modalities and procedures of the CDM under the UNFCCC.

Taking into consideration the current circumstances of the CDM, the major objective of this research is to contribute to proposing effective policy through utilising IGES expertise and capabilities for policy proposals as a strategic policy research institute to convey perspectives of those affected by policies to policy makers. In addition, our research aims at identifying the reasons why the current CDM does not contribute enough to sustainable development for developing countries, and proposing policy inputs for revision of the current rules and procedures of the CDM to the UNFCCC process in order to strengthen its function of achieving sustainable development.

### 3. Major Findings

Based on our research on more than 2,000 registered CDM projects from our CDM databases, we

have found that there is an increasing tendency in the length of CDM procedures until CDM projects get registered by the CDM-EB. CDM projects have to be validated by the operational entity authorised by the CDM-EB before the projects apply to be registered. The projects which were registered between October and December 2004 took approximately 230 days from the start of validation until registration, while the projects which were registered between October and December 2009 took approximately 519 days for the same process.

One of the major reasons for such recent lengthened CDM procedures is that more CDM projects tend to be reviewed by the CDM-EB before registration. According to the current modalities and procedures for the CDM, CDM projects once submitted for registration have to pass through an eight-week period of receiving comments from the host country or the members of the CDM-EB, whether or not there are any doubts about the projects. If the host country or members of the CDM-EB judge that a project is not eligible for the CDM and does not satisfy all necessary requirements, they can claim this and suggest to the CDM-EB to consider the appropriateness and eligibility of the project. Once the CDM-EB admits that there is a need to further investigate project eligibility as the CDM, the CDM-EB organises a special team for further investigation and asks this team to report results to the meeting of the CDM-EB again. Therefore, once a project is being reviewed by the CDM-EB, or under consideration for review during a meeting of the CDM-EB, registration of the project will be crucially delayed. If the project participants cannot correspond to inquiries from the CDM-EB well, the project can be rejected or asked for further clarification.

In fact, the probability of review is increasing. In 2004, 12.2 percent of registered projects were requested to be reviewed, and 1.5 percent of them underwent review, while in 2009, 52 percent of registered projects were requested to be reviewed and 30 percent of them underwent review. Projects which have been rejected by the CDM-EB are also increasing. In 2006, only 2 percent of projects were rejected by the EB, but during 2007-2009, the probability of rejection for registered projects was around 8-10 percent. During 2008-2009, many projects were rejected due to issues associated with using the investment analysis. It must be kept in mind that projects submitted for registration have already been approved by the governments of the host countries and their eligibility for the CDM validated by the designated operation entity (DOE), which has been authorised by the CDM-EB and conducts specific assessment of validation of projects.

Most reasons why these projects have been reviewed are mainly additionality of the projects and issues related to the calculation of emission reductions. Comments were related to additionality 62 percent of the time, where 30 percent of comments were on calculation of emission reductions. Additionality is one of the key elements for the CDM, and it was defined in a rule that a CDM project activity should be additional if greenhouse gas (GHG) emissions are reduced below those that would have occurred in the absence of the registered CDM project activity. However, it was also found that the judgment of additionality – its criteria and methods – is case specific and quite subjective depending on who evaluates the projects. Because of this requirement, uncertainties for project development are increased, which eventually increases the risk factor for project investment. Therefore, the proof of additionality has discouraged projects to be realised as CDM. In other words, project participants cannot rely on the revenue from the CDM because of the additionality requirement. Therefore, it is imperative that the methodology of the CDM be revised while reflecting the lessons learned from past experience so that the rules and criteria should be more clear and straight forward and easy to understand for project developers.

In addition to the proof of additionality issue, it was found that the current CDM transaction cost also gave disincentives to project participants. Project participants have to go through a process of

verification and issuance after registration in order to get monetary and tradable certified emission reductions (CERs) from the registered CDM projects. Until they receive these CERs and sell them to buyers, they will never receive any actual income from the CDM projects, excepting those who receive advanced payment from the contracted buyers. Participants have to bear the cost for each verification and issuance process, which means that capacity of the CDM projects to generate CERs directly affects how much they can afford to undergo the process of verification and issuance. For example, large-scale CDM projects generate an average 126,000 CERs per issuance with a 402-day monitoring period, while small-scale CDM projects generate an average 37,000 CERs per issuance with a 580-day monitoring period. This means that the small CDM projects cannot rely on frequent actual income from CERs as larger CDM projects do. This is a kind of paradox for the current CDM under the current rules and procedures for additionality. The smaller the CDM projects become, the more difficult it is to rely on the help of the CDM such as “additional” income from CERs. What makes matters worse is, the average annual emission reduction of CDM projects continues to decline, with the 450,000 t-CO<sub>2</sub> equivalent of the annual average emission reduction at the end of 2005 decreased down to 170,000 t-CO<sub>2</sub> equivalent in January 2010. This also indicates that the time required for the issuance of CERs from the registered CDM projects has become longer, and the project participants will receive less income from less CERs over a longer period than before.

In short, the current lengthened CDM modalities and procedures, which are caused mainly by complicated processes for proof of additionality, provide only disincentives to the project participants and do not allow further promotion of CDM project activities. In order to improve the current difficult circumstances for registration of CDM projects, the IGES Market Mechanism Project has taken immediate action to submit a variety of policy proposals to the CDM-EB. For example, we proposed that some types of renewable energy projects such as photovoltaics (PV), wind, and geothermal, which have obvious additionality without showing complicated and documented evidence, should be exempted from the proof of additionality under current CDM procedures. In addition, we have proposed a simplification of the procedures for assessment of CDM registration and a shortening of its procedures. Since the nature of the CDM is a market driven mechanism, the streamlining and shortening of procedures plays an important role in incentivising more project participants to participate in the CDM and promote sustainable development through its implementation.

#### **4. Impacts Created: Inputs into Major Policy Processes**

In assisting the CDM in countries in Asia during the course of CDM capacity building activities, we have faced various kinds of difficulties and barriers. Based upon such experience gained through dealing with real projects in the real process, we have made specific proposals and proposed these directly to the CDM-EB.

On 9 November 2007, IGES, together with the Ministry of Environment of the Royal Government of Cambodia (MOE-C) sent the “proposal regarding procedures for registration of CDM project activities in Least Developed Countries (LDCs)” to the CDM-EB. The proposal aimed to reduce financial burdens for potential CDM projects in LDCs. The proposal was reflected into real modification of the CDM rules and procedures, and the UNFCCC secretariat sent letters to both IGES and the MOE-C regarding their acknowledgment of our proposal.

IGES itself also sent the “proposal for the revision of the tool to calculate the emission factor for an electricity system” to the CDM-EB on 8 February 2008.

On 29 October 2008, IGES and MOE-C also sent the “proposal regarding procedures for review of registration of CDM project activities in LDCs,” to the CDM-EB, followed by the “proposal regarding amendment of procedures for requesting changes to the start date of the crediting period for CDM project activities in LDCs”, which was also sent to the CDM-EB on 29 September 2009. Recently, on 13 January 2010, the UNFCCC sent their acknowledgement letter to both IGES and MOE-C again, and the CDM-EB will consider the latter proposal in its 52<sup>nd</sup> meeting in February 2010.

Also, the CDM-EB approved the work on strategic CDM improvements and in this regard, the CDM-EB launched a public call for inputs on efficiency in the operation of the CDM and opportunities for improvement. The call invited inputs between 30 March 2009 and 4 May 2009. On this occasion, the UNFCCC secretariat contacted IGES to request we submit a proposal to that public call for inputs. To respond to this request, we proposed “views on efficiency in the operation of the CDM and opportunities for improvement”, on 1 May 2009. The proposal suggested using ready-made emission reduction calculation excel sheets, which IGES already has published on its website.

In addition to direct inputs to the CDM-EB, we have made strategic policy proposals for the CDM and conducted outreach efforts on various kinds of occasions. One such strategic policy proposal was to remove the additionality test for specific types of CDM projects, such as renewable energy projects. To disseminate and justify the proposal, we organised a side event at COP13 in Bali, Indonesia, and explained why such a proposal is effective, especially to promote sustainable development in developing countries, as well as to facilitate additional emission reductions by the CDM. After that side event, we also organised a series of side events, including UNFCCC official side events at COP14 in 2008 in Poznan, Poland, SB28 in 2008 and SB30 in 2009 in Bonn, Germany, and the IGES CDM capacity building general assembly meeting in 2008 in Kyoto. We also wrote a short article in the CDM & JI Monitor, Vol. 6, Issue 23, published by Point Carbon, entitled, “The paradox of additionality in the CDM”.

We believe, partly due to these continuous efforts made by IGES, the Conference of the Parties, serving as the meeting of the Parties to the Kyoto Protocol, decided at its 5<sup>th</sup> session in Copenhagen, to establish simplified modalities for demonstrating additionality for project activities up to 5 megawatts that employ renewable energy as their primary technology. We think our activities impacted the international CDM rules and procedures.

## 5. List of Publications

(For publications continuously updated, only the newest versions are listed.)

Mizuno, Y. (2009) CDM in CHARTS (version 8 and 9), IGES

Mizuno, Y. (2009) Zukai Kyoto Mechanisms (Japanese)(Version 11), IGES

Mizuno, Y. (2009) GHG Emissions Data (updated continuously), IGES

Okubo, N. (2009) Registry Data (updated continuously), IGES

Urayama, C., Takahashi, K. and Okubo, N. (2009) Options on the Future Market Mechanisms under the International Negotiation (updated continuously), IGES

Iyadomi, K. (2009) CDM Project Database (updated continuously), IGES

Iyadomi, K. (2009) CDM Project Data Analysis (updated continuously), IGES

Koakutsu, K. (2009) CDM Review and Rejected Project Database (updated continuously), IGES

Koakutsu, K. (2009) CDM Review and Rejected Project Data Analysis (updated continuously), IGES

Takahashi, K. (2009) CDM Investment Analysis Database (updated continuously), IGES

Urayama, C. (2009) CDM Programme of Activities (PoA) Database (updated continuously), IGES

- Okubo, N. (2009) JI Project Database (updated continuously), IGES
- Iyadomi, K. (2009) CDM Country Fact Sheet: Cambodia (updated continuously), IGES
- Iyadomi, K. (2009) CDM Country Fact Sheet: China (updated continuously), IGES
- Okubo, N. (2009) CDM Country Fact Sheet: India (updated continuously), IGES
- Takahashi, K. (2009) CDM Country Fact Sheet: Indonesia (updated continuously), IGES
- Iyadomi, K. and Urayama, C. (2009) CDM Country Fact Sheet: Lao PDR (updated continuously), IGES
- Koakutsu, K. and Urayama, C. (2009) CDM Country Fact Sheet: the Philippines (updated continuously), IGES
- Okubo, N. (2009) CDM Country Fact Sheet: Thailand (updated continuously), IGES
- Iyadomi, K. (2009) Emission Reductions Calculation Sheet: Grid Emission Factors (updated continuously), IGES
- Iyadomi, K. (2009) Emission Reductions Calculation Sheet: ACM0010 Version 5 (Consolidated methodology for GHG emission reductions from manure management systems), IGES
- Takahashi, K. (2009) Emission Reductions Calculation Sheet: ACM0012 Version 3.2 (Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects), IGES
- Iyadomi, K. (2009) Emission Reductions Calculation Sheet: ACM0014 Version 3.1 (Mitigation of greenhouse gas emissions from treatment of industrial wastewater), IGES
- Iyadomi, K. (2009) Emission Reductions Calculation Sheet: AMS-III.H. Version 13 (Methane recovery in wastewater treatment), IGES
- Iyadomi, K. (2009) Emission Reductions Calculation Sheet: AMS-III.D. Version 15 (Methane recovery in animal manure management systems), IGES
- Koakutsu, K. and Mizuno, Y. (2009) "The clean development mechanism (CDM): Principle and Current Status (in Japanese.)," *Japan Society of Material Cycles and Waste Management*, Vol. 20, No.4, pp. 149-157
- De Lopez, T., Tin, P., Iyadomi, K., Santos, S., and McIntosh, B. (2009) "Clean Development Mechanism and Least Developed Countries: Changing the Rules for Greater Participation," *Journal of Environment and Development*, 18(4), pp. 436-452
- Mizuno, Y. (2009) "Brief overview of the clean development mechanism," *ecoBRAIN Gazette*, January 2009, DAI-ICHI HOKI
- Iyadomi, K. (2009) "Current situation of the CDM in China," *ecoBRAIN Gazette*, January 2009, DAI-ICHI HOKI
- Okubo, N. (2009) "Current situation of the CDM in India," *ecoBRAIN Gazette*, March 2009, DAI-ICHI HOKI
- Koakutsu, K. (2009) "Current situation of the CDM in the Philippines," *ecoBRAIN Gazette*, July 2009, DAI-ICHI HOKI
- Okubo, N. (2009) "Current situation of the CDM in Thailand," *ecoBRAIN Gazette*, September 2009, DAI-ICHI HOKI
- Iyadomi, K. (2009) "Current situation of the CDM in Cambodia," *ecoBRAIN Gazette*, November 2009, DAI-ICHI HOKI
- Mizuno, Y. (2008) "The paradox of additionality in the CDM," *CDM & JI Monitor*, Vol.6, Issue 23, p.7, Point Carbon
- Mizuno, Y. (2008) "Involving major developing countries in a global sectoral approach to emissions cuts," *CDM & JI Monitor*, Vol.7, Issue 42, p. 7, Point Carbon
- Mizuno, Y. (2008) "The past, present and future of the clean development mechanism," *Jurist*, Vol. 1357, pp. 87-94
- Mizuno, Y. (2008) "European Union Emissions Trading Scheme," *Nikkei Business Special Edition*, pp. 16-17
- Mizuno, Y. (2007) "International situation on emissions trading scheme," *Journal of Resources and*

*Environment*, Vol. 43, No.15, pp. 34-38

## **6. Self-evaluation**

### **(1) *Relevance***

Although the CDM has been deemed a success in terms of numbers, there have been accumulating criticisms and frustrations with the CDM. The project strived to improve this situation by analysing the situation quantitatively and proposing possible solutions based upon such data. This kind of approach as well as subject setting is most relevant to a strategic policy research institute, like IGES.

### **(2) *Effectiveness***

The electronic publications created by the project were downloaded from IGES website for a total of 240,000 files during the Fourth Phase, which makes up 60 percent of total files downloaded from IGES website. We acknowledge that this number demonstrates the effective outreach of our expertise to the world.

Also, another fact that shows the effectiveness of our activities is that the project concluded Memorandums of Understanding (MoUs) for implementing CDM capacity building, directly with CDM authorities in countries in Asia, namely the Ministry of Environment of the Royal Government of Cambodia, Indonesian Ministry of Environment, Water Resources and Environment Administration of Lao PDR, Environment Management Bureau of Department of Environment and Natural Resources of the Philippines and the Thailand Greenhouse Gas Management Organisation. The project also concluded an MoU for CDM data exchange with the UNFCCC secretariat. Without the effectiveness of our activities, these authorities and organisations might not have agreed to conclude MoUs directly with IGES.

### **(3) *Efficiency***

The project organised sixty workshops during the Fourth Phase, which means we conducted a workshop almost once every two weeks. The project members made 150 presentations in total during the Fourth Phase, which means someone in the project spoke in front various kinds of audiences every week. The project publicised 150 publications in total, including updates, during the Fourth Phase, which means we created some outputs every week. These figures show the efficiency of our research.

### **(4) *Outputs and Impacts Created***

As stated above, we have accomplished a large number of activities and created a large number of outputs, which reached relevant people in the world. Through such activities and outputs, our policy proposals regarding improving the CDM were reflected onto the international rules of the CDM. We understand that this is one of the real impacts created by us.

## **7. Conclusion**

The project intended to contribute to effective CDM policy-making through utilising the expertise and advocacy skills we possess as an institute for strategic policy research and conveying perspectives of those affected by policies, and to promote action on the part of the affected entities by clearly informing them about adopted policies. The project also intended to contribute to solving barriers to the CDM as much as possible by thoroughly engaging in policy-making processes as a catalyst for smooth construction of mutual relationships between different entities. Thus, our activities during the Fourth Phase have achieved much in line with these aims.



# Biofuels Project

## 1. Sustainable Use of Biofuels in the Transport Sector in Asia: Policy Implications and Options

### 1.1. Objectives

This project aims to assess the benefits and costs of biofuel use in Asia, and by putting special focus on the transport sector, it hopes to propose policy options that optimise the application of biofuels in an environmentally sustainable manner. The project planned to first identify the overall advantages and disadvantages of various forms of biofuels currently produced and used in Asian countries. Next, it planned to assess current policies affecting the use of biofuels in transport in the Asian region and the potential environmental, social and economic impacts of biofuel trade in Asia. Finally, it planned to formulate policy options for optimal biofuel use in transport in Asian countries.

This research has been conducted in collaboration with universities and other research institutes and funded by two research grants. The 'Biofuel Utilisation Strategies for Sustainable Development' (BforSD) project is funded by the Ministry of the Environment of Japan for FY2008 to FY2010 and led by the University of Tokyo. The other project, led by Keio University, was funded by the Japan Science and Technology Agency (JST) from FY2007 to FY2009 (conducted by PMO-EA). The final output of this project from the Fourth Phase is expected to be the preliminary results of the analysis conducted in the Asian region on biofuel policies and their impacts.

### 1.2. Major Findings

#### a. Overall Findings

There is no general consensus regarding the best policies for biofuels. Overall, waste-to-biofuels or so-called second generation biofuels based on cellulosic biomass have considerably more potential than first generation biofuels and are more consistent with sustainable development principles; however, technologies for commercial-scale second generation biofuel production are still under development and overall impacts based on life-cycle assessment (LCA), related to which decisions would be made, are still widely unknown. It appears theoretically possible to produce first generation biofuels sustainably in Asia, especially as long as the issue of land use change is addressed. In addition, biofuels could contribute to GHG reduction, energy security, and poverty reduction, at least to a limited extent. However, there are strong economic incentives found in Asian countries to produce biofuels unsustainably. Until there is reasonable assurance that biofuels can be sustainably produced, it would be better to adopt a cautious approach. These overall issues and trade-offs identified were summarised in an IGES White Paper chapter (Elder et al., 2008). In addition, it is important to recognise the diversity of conditions in countries and to tailor appropriate policies in each country that are comprehensive across sectors (such as energy, environment, agriculture, and transport), durable under uncertainties (such as oil price changes and technological development), and have longer-term perspectives (such as R&D). These findings were highlighted and presented at various conferences and occasions including the ISAP 2009.

## ***b. Specific Findings***

To comprehend the complex issues of biofuel utilisation and to formulate more concrete policy options, qualitative studies (four case studies at the country level in China, India, Indonesia and Japan, and one study at the regional level) and a quantitative study (modeling analysis) were conducted.

The case studies confirmed that particular emphasis was placed on larger-scale production from a few dominant feedstocks in these developing countries in the initial stages of biofuel promotion, but growing concerns about potential food-fuel conflicts and negative environmental impacts from land use change caused a reconsideration of the policies. In some instances, this led to the implementation of policies to limit biofuel production from food crops (China and India) and the formulation of more measured and less ambitious promotion policies (India and Indonesia). High production costs and difficulties in shifting production from alternative feedstocks were commonly found in these case study countries. Japan has devoted significant efforts to develop second generation biofuels; however, technological advances were still insufficient for commercial production. Major points found in each study are summarised below.

In the case of China, biofuels should be viewed in the context of China's overall policy on renewable energy. China has placed a very high priority on expanding the use of renewable energy as its demand for energy rapidly increases. The Renewable Energy Law enacted in 2005 mandates an increase in use of renewable energy, including biofuels, to a 15 percent share by 2020 from eight percent in 2006. China quickly acted to stop approving new projects using food-based ethanol in May 2007 for fear that expanding food-based ethanol production would cause food prices to rise significantly. Although China's biofuel production reached a significant scale (the third largest bioethanol producer in the world), blending mandates for bioethanol were introduced in ten provinces/autonomous regions, and thus the government is seeking alternative feedstock to expand biofuel production from non-food sources. Bioethanol production from cassava (non-food purpose) and biodiesel production from jatropha on non-arable land have been identified as potential options. Regarding biodiesel production from jatropha, results of field survey data conducted in Yunnan province in 2008 indicate that although direct food-fuel conflict in farmland was seemingly avoided per the policy of "no fuel crops on farmland", indirect impacts on food production could arise if more labour is absorbed by jatropha production. Labour availability may become a critical factor once full-scale harvest, which is considered rather labour intensive, starts. Labour availability could become scarcer as the agricultural population is decreasing in China. In addition, the future market is uncertain, and risk-averse farmers have adopted a wait-and-see attitude in spite of the government-led promotion. In this sense, economic viability may be the most significant limiting factor for sustainability, rather than resource availability in the rural context at the moment (Sano and Romero 2010a). Currently the field survey data of bioethanol production from cassava collected in Guaxi province in 2009 are being analysed.

In the case of India, the country's rapid economic expansion continues to drive up its energy demand, boosting the country's share of global energy consumption. To counter the rapid domestic energy demand and increasing dependency on imported fossil fuels, India is now increasingly looking for indigenous and renewable energy resources. In the process of doing so, ethanol is playing a modest role. High hopes and much effort have been placed on biodiesel, although little progress has been made so far. India's policy has emphasised efforts to use non-food crops like jatropha on wastelands. However, there is considerable controversy regarding exactly what a wasteland is and how much wasteland actually exists. Many wastelands are already being used by poor people or are

performing ecosystem services. India may not have enough resources like land, capital, and even labour (both skilled and unskilled), as well as other farm inputs sufficient to produce the approximate eight million tons of biodiesel and 900 million litres of bioethanol per annum that would be necessary to reach blending targets. In FY2009, we primarily focused on the issues of resource constraints on production of the required amount of biofuels in the country, along with production cost issues. We have been conducting two separate studies on India toward the following aims:

- 1) To estimate the optimal level of bioethanol production from sugarcane in India given the constraint of groundwater availability for irrigation. Bioethanol is the only biofuel which has been produced nationally on a significant scale in India so far. Biodiesel is yet to be produced and distributed on a national scale.
- 2) To estimate the energy balances of the planned feedstocks for biofuel production in India and to compute their cost benefits.

Initial findings indicate that the Indian bioethanol target may be too ambitious under the current conditions of groundwater availability. The current level of sugarcane production is very unsustainable, as it is over exploiting groundwater resources. As a consequence, groundwater is being excessively depleted, and therefore, long term ethanol production, including for biofuels, is in jeopardy. The initial findings in the second study are negative in the sense that most of the major feedstocks for biofuel production identified in India are energy negative along their life cycle path. It is therefore important to identify certain less specific energy consuming feedstocks for biofuels which might be possible only from cellulosic sources or even from third generation algae (Conducted by PMO-EA).

In the case of Indonesia, Indonesia has been a net oil importer since 2004, but in 2007 it overtook Malaysia as the world's largest palm oil producer. Biofuel development became an integral part of Indonesia's national energy diversification programme. The issuance of Presidential Instruction No.1/2006 was aimed to accelerate biofuel utilisation as a fossil fuel substitute. This was followed by Presidential Decree No. 10/2006 establishing the National Team for Biofuel Development for poverty and unemployment alleviation, mandated to draft the national blueprint for biofuel development. The road map of biofuel development in Indonesia identified crude palm oil (CPO) and jatropha curcas as the main feedstocks for biodiesel and sugarcane and cassava as the main feedstocks for bioethanol. The Indonesian government has set blending mandates at ten percent for biodiesel, effective from 2010, and 20 percent for bioethanol starting in 2015, with the target of producing 29 billion litres of biodiesel and 17.3 billion litres of bioethanol by 2025. In the short run, biofuel development is expected to enhance the rural economy, job creation, and poverty alleviation (pro-growth, pro-job and pro-poor). In the long run, the generation of energy from local available renewable sources through the Energy Self Sufficient Village (ESSV) programme and the Special Biofuel Zone (SBZ) by encouraging each region to develop its biofuel potential, is expected to contribute to national energy security. The policy review conducted was supplemented by a stakeholder dialogue organised by IGES in February 2009 for identifying the barriers and potentials of promoting a nation-wide scale biofuel plan. In spite of the government provision of subsidies as well as investment guarantees and protections to encourage biofuel investments, there have been difficulties in implementing the biofuel road map, with problems ranging from political will/leadership, environmental implications and fluctuating markets to technical barriers. A preliminary survey was conducted in October 2009 in two ESSV villages in Wonogiri, Central Java – one village utilising cassava as feedstock and the other village sweet sorghum – to assess the socio-economic impacts of biofuel development in rural areas. The survey established baseline information on household characteristics, farming practices

and other relevant information as the farmers engage in biofuel feedstock production. The intention is to process the cassava and sweet sorghum to produce biokerosene to augment their cooking energy needs. The processing equipment provided by the government was under construction during the preliminary survey. Generally the farmers interviewed were supportive of the government biofuel promotion, but they raised some issues to ensure that they would be part of the foreseen benefits from the project. One of the immediate needs raised by farmers was capacity enhancement on farming practices, especially those who planted sweet sorghum as it was their first time to plant the crop. A full survey was conducted in March 2010, while data analysis will be carried out in the next phase.

In the case of Japan, the study first reviewed national strategies and plans related to biofuels, which address four main policy objectives, namely reduction of greenhouse gas (GHG) emissions, energy security, rural development, and realisation of a recycle-based society, and examined the extent to which biofuels can contribute to these objectives. The study found that the long-term potential for biofuels to contribute to GHG reduction goals will depend not only on the rates of technological development of second generation biofuels but also on the development of other advanced vehicles. In the medium term, the potential contribution of biofuels to rural development and realising a recycle-based society could become significant depending on the progress of technology for both second generation biofuel production and the collection and transportation of their feedstocks. The potential contribution of biofuels to Japan's energy security is constrained by the availability of imports and the potential for domestic production. The analysis was published in *Applied Energy* (Matsumoto, Sano and Elder, 2009). In addition, detailed reviews were conducted on the current status of biofuel policies in Japan and the country's international involvement in sustainability criteria and technical cooperation. Based on these reviews, challenges and opportunities for biofuel utilisation in Japan were identified. Major challenges include lack of economically viable agricultural feedstocks, potential environmental impacts in ethanol exporting countries, and unharmonised distribution standards in bioethanol. On the other hand, advantages of biofuels include immediate availability and fewer additional infrastructure requirements compared to other transport alternatives, the potential to utilise waste materials, and the potential to produce feedstocks on abandoned cultivated land. Based on the above results, the study plans to focus on additional case studies on ethanol production from waste materials. Two bioethanol production projects were identified, and a preliminary literature review is being conducted (production from construction wastes in Sakai City, Osaka Prefecture and from food wastes in Kitakyushu City, Fukuoka Prefecture).

Regarding the quantitative analysis, a general equilibrium model based on the GTAP dataset was developed by incorporating a forecast for GHG and NO<sub>x</sub> emissions. Simulations found that hypothetical tariff reductions on imported biofuels or domestic increases in fossil fuel taxes plus a biofuel subsidy could have impacts on Japan's biofuel imports, domestic biofuel production and consumption, and GHG emissions, without a significant decrease in real GDP (Conducted by PMO-EA).

The study also explored several types of initiatives for sustainability standards. These were differentiated by the nature of leadership and management, scope and focus of standards and criteria, membership, and geographic coverage. In this fiscal year, attention was mostly focused on RSB (Roundtable for Sustainable Biofuels), a comprehensive global multi-stakeholder initiative in which IGES is a participant. The RSB made a significant first step to prepare a draft of "Global principles and criteria for sustainable biofuels production" as an output of multi-stakeholder discussions; however, the draft still leaves various issues left unsolved. Therefore, it is important to

continue discussions and make research-based contributions, considering that a wider range of feedstock would be used for biofuels in Asia in the future. Analysis was also conducted to examine why CDM has not been effective as a sustainability initiative to promote sustainable production of biofuels.

### **1.3. Impacts Created: Inputs into Major Policy Processes**

The output of this research indirectly feeds into important policy processes like the East Asia Summit and ASEAN Energy Ministers Meeting through IGES membership in the Economic Research Institute for ASEAN and East Asia (ERIA) Working Group on Sustainable Biomass Utilisation. The East Asia Energy Ministers requested this working group to develop a methodology for assessing the environmental and social sustainability of production and utilisation of biomass, specifically biofuels, taking into account specific regional circumstances.

IGES also has direct communications with key biofuel policymakers in India and Indonesia, and invited some to participate in the biofuel session at the ISAP 2009. UNESCAP also participated in the biofuel session at ISAP 2009. One BforSD Advisory Board member has close connections with key biofuel-related policymakers and committees in Japan. IGES is participating in the RSB, one of the major global multi-stakeholder initiatives, which is developing global biofuel sustainability standards. IGES research results were presented at the Asia Regional Seminar for Sustainable Resource Management in 2009 and 2010.

### **1.4. List of Publications**

#### **(1) Peer-reviewed**

- Elder, Mark, P. SVRK, J. Romero, and N. Matsumoto. 2008. "Prospects and Challenges of Biofuels in Asia: Policy Implications". In *Climate Change Policies in the Asia-Pacific: Re-uniting Climate Change and Sustainable Development*, edited by H. Hamanaka, A. Morishima, H. Mori and P. King. Hayama, Japan: Institute for Global Environmental Strategies.
- Matsumoto, Naoko, D. Sano, and M. Elder. 2009. "Biofuel initiatives in Japan: Strategies, policies, and future potential". *Applied Energy* 86 (2009) S69-S76.
- S.V.R.K., Prabhakar, and M. Elder. 2009. "Biofuels and Resource Use Efficiency: Back to Basics". *Applied Energy* 86 (2009) S30-S36.

#### **(2) Non peer-reviewed**

- Elder, Mark and J. Romero. 2008. "Biofuel Ambitions Could Easily Be Pipe Dreams". *Bioenergy Business* 2, no. 10 12-13.
- Kojima, Satoshi, D. Sano, and N. Matsumoto. 2008. アジアにおける持続可能なバイオ燃料活用のための政策研究 (Policy research on sustainable biofuel utilisation in Asia), 産業と環境 (Industry and Environment), January, No.1, 2008. p29-32.
- Sano, Daisuke, and N. Matsumoto. 2008. バイオ燃料をめぐる課題と政策への一考察 (Discussion about biofuel topics and policies), 資源環境対策 (*Journal of Resources and Environment*), December.
- SVRK, Prabhakar, and M. Elder. 2008a. "CO<sub>2</sub> Reduction Potential of Biofuels in Asia: Issues and Policy Implications". In *Energy Security and Climate Change: Issues, Strategies and Options* (ESCC). Bangkok, Thailand, August.
- SVRK, Prabhakar, and M. Elder. 2008b. "Biofuels and Rural Development in India: Public-Private

- Partnerships in Andhra Pradesh". *What's New from IGES*, November 3.
- IGES, Co-operation for Development Europe. 2009. Workshop Report: Research Workshop on Sustainable Biofuel Development in Indonesia. Sultan Hotel, Jakarta, Indonesia, 4-5 February.
- University of Tokyo, Osaka University, National Agriculture and Food Research Organisation, United Nations University, and IGES. 2009. 地球環境研究総合推進費「アジア太平洋地域を中心とする持続可能な発展のためのバイオ燃料利用戦略に関する研究 (Hc-082)」中間成果報告書 (Report on Research on Biofuel Use Strategies for Sustainable Development, prepared for the Global Environmental Research Fund Interim Evaluation), August.
- Sano, Daisuke and N. Matsumoto. 2009. "途上国のバイオ燃料政策の光と影—持続可能なバイオ燃料利用は可能か "[Opportunities and Risks of Biofuel Policies in Developing Countries: Is Sustainable Biofuel Utilisation Possible?]. 環境情報科学 [*Environmental Information Science*] 38(3) 22-26.

### **(3) Selected presentations**

- Elder, Mark. 2008. "Biofuels". The IGES 10th Anniversary Forum on Strategy to Combat Climate Change in Asia and the Pacific, Yokohama, Japan, June.
- Matsumoto, Naoko. 2008. "Biofuel Development in Asia". In AIESEC University of Tokyo Committee Lecture, Tokyo, Japan, November.
- Romero, Jane. 2008. "Biofuels in Asia: What's Next After the Kyoto Protocol". In Better Air Quality (BAQ) 2008. Bangkok, Thailand, November.
- Sano, Daisuke. 2008. "Opportunities and challenges of biofuels". In 12<sup>th</sup> Shonan Village Youth International Seminar. Yokohama, Japan. December.
- Elder, Mark. 2009a. "Biofuels and Sustainability in Asia". In Asia Regional Seminar for Sustainable Resource Management. Tokyo, Japan, February.
- Elder, Mark. 2009b. "Introduction to open session on biofuels and sustainability in Asia". International Forum for Sustainable Asia and the Pacific (ISAP) 2009, Hayama, Japan, 26-27 June.
- Bhattacharya, Anindya. 2010. "Biofuel Production and Water Constraint: An Effective Utilisation of Watershed Projects In India". In the International Symposium on a Sustainable Future (ISSF 2010), Mumbai, India, 12 January 2010.
- Elder, Mark. 2010. "Panel Presentation: Session V – Panel Discussion on Biofuel Policy in India". In the International Symposium on a Sustainable Future (ISSF 2010), Mumbai, India, 12 January.
- Kojima, Satoshi. 2010. "Impacts of biofuel promotion policy in India: an assessment using a dynamic CGE model." In the International Symposium on a Sustainable Future (ISSF 2010), Mumbai, India, 12 January.
- Matsumoto, Naoko, D. Sano, M. Elder. 2009. "Biofuel initiatives in Japan: strategies, policies, and future potential". At the International Workshop on Sustainable Energy Crops and Biofuels Development in China and Asia, organised by the Ministry of Agriculture, PRC and the Asian Development Bank, Beijing, China, 16 October.
- Matsumoto, Naoko. 2010. "Policy challenges for Biofuels in Asia", At the MOEJ Seminar on Sustainable Resource Management/ Fourth IGES Global Environment Seminar, "Sustainable Resource Management and Asia - Focusing on Discussions by the UNEP Resource Panel" JICA Global Plaza, 11 March.
- Romero, Jane and M. Elder. 2009. "CDM and Biofuels: An Assessment". In Winrock International 6th International Biofuel Conference. New Delhi, India, March.
- Romero, Jane, S. Rao and NSS Prasad. 2009. "CDM potential of sweet sorghum". At *Workshop on awareness building for CDM in biofuel production*, ICRISAT, Patancheru, Hyderabad, India, 2-3 April.
- Romero, Jane. 2009a. "Sustainable biofuel development from the perspective of environmental

- policy". At the World Renewable Energy Regional Congress and Exhibition II, Jakarta, Indonesia, 17-19 June.
- Romero, Jane. 2009b. "Choosing renewable energy: Ensuring sustainable biofuel development". At the National Conference on Renewable Energy and Materials Research, Universitas Sebelas Maret, Solo, Indonesia, 14 October.
- Romero, Jane. 2009c. "Environmental integrity of biofuels: Energy and carbon balance, biodiversity, water and forests". At the *Regional dialogue on biofuels in Asia: Striking a balance between trade, agriculture and energy policies*, organised by the International Institute for Trade and Development (ITD), Novotel Hotel, Bangkok, 9-10 November.
- Romero, Jane. 2010. "A tale of two countries - India and Indonesia: how collaboration can promote sustainable biofuel development". In the International Symposium on a Sustainable Future, Mumbai, India, January.
- Sano, Daisuke. 2009. "Current Conditions and Challenges of Biofuels". In IGES 2008 3rd Environmental Seminar, Tokyo, Japan, February.
- Sano, Daisuke and J. Romero. 2010a. "Biofuels in China: Strategies and some implications". In the International Symposium on a Sustainable Future (ISSF 2010), Mumbai, India, 12 January.
- Sano, Daisuke and J. Romero. 2010b. "Sustainable biofuels in China: lessons from jatropha production in Yunnan". Submitted for the Winrock 7th International Biofuel conference, New Delhi, 11-12 February.

#### **(4) Publications in preparation**

- Matsumoto, Naoko and D. Sano. From Wastes to Ethanol: case studies in Japan (tentative). Hayama, Japan: IGES.
- Sano, Daisuke and J. Romero. China Jatropha production in Yunnan: Implications on sustainability at the village level (under review of the UNU biofuel publication project)

### **1.5. Self evaluation**

#### **(1) Relevance**

Recently, biofuels have been promoted as alternative energy resources to fossil fuels in the world. Biofuels are expected to contribute to reducing greenhouse gas emissions, vitalising economies in agricultural communities and alleviating poverty. However, in spite of their anticipated benefits, international organisations such as the FAO, OECD, and UN have expressed their concerns in reports that biofuel promotion may lead to deforestation, water pollution and water shortage ("FAO sees major shift to bioenergy", FAO, 2006; "Biofuels: Is the cure worse than the disease?", OECD, 2007; "Sustainable Bioenergy: A Framework for Decision Makers", UN Energy, 2007). Although the hype about biofuels has receded, they have remained an important policy issue, and Japan and the EU are now considering the issue of biofuel sustainability standards. Other important countries such as India and Indonesia continue to consider revisions in their biofuel policies. Biofuels will remain an important topic as long as energy issues continue to be a high priority.

#### **(2) Effectiveness**

The IGES Biofuels Project has been effective in terms of implementing field research, coordinating with partner institutes, producing written outputs, organising workshops with policymakers, receiving invitations as speakers, making outreach presentations, and participating in a major biofuel-related policy process.

### **(3) Efficiency**

Although several researchers worked on this project, all of them had multiple significant responsibilities, so in fact the amount of time each could spend on this project was limited, especially in the final year of the 4<sup>th</sup> phase. Moreover, in the final year of the 4<sup>th</sup> phase, the biofuels team was separated into two different operational groups, complicating the coordination. Despite these obstacles, reasonable results were achieved, although more could have been accomplished with more focused human resource allocation and organisation.

### **(4) Outputs and Impact Created**

IGES research results, especially the peer-reviewed journal articles and IGES White Paper chapter, have resulted in a measure of global recognition, including invitations to speak at workshops organised by the Chinese Ministry of Agriculture and ADB (China), the Asia Regional Seminar for Sustainable Resource Management (Tokyo), Better Air Quality (BAQ) in 2008, the International Institute for Trade and Development (ITD) (in Bangkok, Thailand), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT -- Hyderabad, India), the World Renewable Energy Regional Congress and Exhibition II (Jakarta, Indonesia) in 2010, and the Winrock International 6th International Biofuel Conference (New Delhi, India) in 2009 and 2010. IGES has also been invited to contribute a chapter to a book being organised by UNU-IAS. IGES had media coverage in newspapers, the Times of India, and the Jakarta Post. IGES was also invited to contribute to one international and several Japanese monthly journals.

The Biofuels Project organised workshops, including one for policymakers in Indonesia (2009), one in Japan (ISAP 2009), and one in India (in conjunction with the Indira Gandhi Institute of Development Research, 2010). UNESCAP also participated in the biofuel session at ISAP 2009.

IGES membership in ERIA's Working Group on Sustainable Biomass Utilisation indicates that IGES research on biofuels is valued and recognised as relevant to the Asia Pacific region. The collaboration with ERIA is an important means to input the Biofuels Project research outputs into relevant policy processes in the region. In addition, IGES is a member of the Roundtable on Sustainable Biofuels (RSB), one of the major global multi-stakeholder initiatives, which is developing global biofuel sustainability standards. IGES has been participating in global stakeholder consultation meetings by teleconference. IGES participated in one regional consultation meeting in Shanghai in 2007, and will participate in a global workshop in Brazil in June 2010 on the extent to which indirect impacts of biofuels could be linked to feasible sustainability standards, which is one of the most important and controversial issues related to biofuel standards.

## **1.6. Conclusion**

The Biofuels Project will continue into the first year of the 5th phase, since it has one additional year of funding from the Global Environment Research Fund. As a result of the 5<sup>th</sup> phase internal reorganisation, the biofuels team members have been scattered among four different groups. Therefore, the Biofuels Project will become a leading example of more extensive cross-project collaboration within IGES. In its final year, the Biofuels Project will contribute to the BforSD book project and the final symposium coordinated by the University of Tokyo, and organise an open session and expert workshop at ISAP 2010, in addition to its own final reports.

# Forest Conservation Project

## 1. Innovative Models to Promote Forest Certification for Small Forest Enterprises as a Livelihood and Conservation Strategy

### 1.1. Objectives

- Understand the preconditions for certification for small forest enterprises to be a cost-effective option for promoting sustainable forest management;
- Assess and compare approaches to support small forest enterprises to acquire forest certification and mill and market their certified timber;
- Develop guidelines for chain-of-custody for timber products.

### 1.2. Major Activities

FC Project activities on forest certification included (i) field-based surveys, (ii) analysis of national standards, (iii) presentations of results at national and regional fora, and (iv) the drafting of chain-of-custody guidelines.

The Project conducted a survey of nine village-based timber enterprises in PNG that are milling Forest Stewardship Council (FSC) certified timber with the support of the Forest Management and Product Certification Service (FORCERT). This research found that the socio-economic benefits to communities of forest certification are potentially significant. They include: increased household income and greater diversity of household income sources; wood materials for housing and community projects, such as the building of schools; and sustainable forest management, meaning that forests continue to supply timber and non-timber forest products, as well as services such as soil conservation, water supply, and flood protection.

The Project commissioned an Indonesian expert to compare the FSC Group Certification standard and the Indonesia Ecolabelling Institute standard for community-based forest management, finding that while the latter is a credible standard, it has much less international market recognition than the former.

FC was contracted by The Nature Conservancy to develop chain-of-custody guidelines for the Pan-ASEAN Certification Initiative and completed this work.

The research results were presented at the following events:

- “PNG FSC National Forest Certification Workshop”, 11-12 March 2008, Port Moresby, PNG.
- “International Conference on Poverty Reduction and Forests: Tenure, Market, and Policy Reforms”, 3-7 September 2007, Bangkok.
- 17th academic conference of the Japan Society of Tropical Ecology.
- Workshops on “Promoting Certified and Verified Legal Tropical Timber and Timber Products in Japan”, 29, 31 July 2008, Tokyo and Osaka.

- Technical Session on ASEAN Timber Legality Standards and Chain of Custody Guideline for Legal/Sustainable Timber, 7 April 2009, Bandar Seri Begawan.
- Eight Meeting of the Working Group on a Pan-ASEAN Timber Certification Initiative, 8-9 April 2009, Bandar Seri Begawan.

### **1.3. Impacts Created: Inputs into Major Policy Processes**

FC provided input into the revision of the FSC national forest management standard for PNG.

FC presented the chain-of-custody guidelines at a Pan ASEAN Timber Certification Initiative Working Group meeting. The Pan-ASEAN Certification Initiative is intending to adopt the chain-of-custody guidelines after simplifying them.

### **1.4. List of Publications**

- Scheyvens, H. Oct. 2007. *Forest certification in Papua New Guinea: Progress, prospects and challenges*, Project Occasional Paper #1.
- Scheyvens, H., K. Harada and K. Hyakumura. 2008. *Incorporating certification into a pro-poor forestry agenda: Lessons from, and options for, the Asia-Pacific Region*. Published in proceedings of "International Conference on Poverty Reduction and Forests: Tenure, Market, and Policy Reforms", 3-7 September 2007, Bangkok.
- Scheyvens, H. and F. Lopez-Casero. 2009. *Chain-of-custody guidelines: Pan-ASEAN Timber Certification Initiative*.
- Scheyvens, H. 2009. *Forest Management and Product Certification Service, PNG: Socio-economic impact survey*. IGES.
- Maryudi, A. 2009. *Options for certifying small-scale forestry in Indonesia: A comparative analysis of the Indonesian Ecolabelling Institute and the Forest Stewardship Council schemes*. Project Occasional Paper #3.

### **1.5. Self-evaluation**

#### **(1) Relevance**

Highly relevant: The attention on the link between deforestation and climate change has further raised interest in forest certification as an instrument to guide, verify and reward good forest management.

#### **(2) Effectiveness**

The chain-of-custody guidelines have a clear target (ASEAN member countries) and were requested. Impact will have to be monitored after they are adopted by ASEAN member countries. FC had close contact with the forest certificate holders (practitioners) during the research, meaning that the results were readily available to the practitioners.

#### **(3) Efficiency**

The publications on innovative forest certification models and on chain-of-custody were

completed relatively quickly after data gathering and analysis were completed.

#### ***(4) Outputs and Impact Created***

Stakeholders expressed appreciation for the outputs that had a clear audience.

### ***1.6. Conclusion***

Through several years of research on forest certification, IGES has built core expertise and has developed a niche in policy research on certification for small forest enterprises.

## **2. Options for Introducing and Strengthening Timber Procurement Policies**

### ***2.1. Objectives***

- To describe and analyse the context and features of Japan's timber procurement policy;
- To undertake an assessment of the strengths and possible weaknesses of this policy;
- To elaborate the essential elements that a public timber procurement policy should include for it to be robust.

### ***2.2. Major Activities***

FC activities consisted of (i) evaluation of Japan's procurement policy for legal and sustainable timber, (ii) comparison of Japan's policy with those of the UK, the Netherlands and France, (iii) contract work for Chatham House, (iv) a survey on role and awareness of Japan's procurement agents, and (v) presentation of research findings in national and international fora.

An extensive literature review and key interviews with policy-makers and other stakeholders in Japan, UK, Denmark, the Netherlands and France were conducted, and the results were published. Research on the role and awareness of Japan's procurement agents in implementing Japan's public timber procurement policy through a questionnaire survey was conducted, with 200 responses received. Further, FC was contracted by Chatham House to research Japan's policy to tackle the trade in illegal timber.

For Japan's policy, the research recommended the establishment of a support agency to (i) develop legality/sustainability standards, (ii) conduct assessments of existing verification schemes, and (iii) research and advise on documentation that each country can provide as evidence of legality and sustainability.

The outputs of the research were presented at:

- "International Workshop on Policies on Trade in Timber and Timber Products", 6-7 December 2008, Beijing.
- "3rd Forum on China and the Global Forest Products Trade: Trade of Legal and Sustainable Wood in China", 18-19 June 2008, Beijing.
- "G8 Illegal Logging Experts Meeting", 3-4 March 2008, Tokyo.
- "Chatham House Illegal Logging Update", 17-18 January 2008, London.

- “International Seminar for Tackling Illegal Logging II”, 3-4 December 2007, Yokohama.
- “Asia Forest Partnership 7th Meeting”, 13-14 November 2007, Yokohama.
- “1st Forum on China and the Global Forest Products Trade: Trade of Legal and Sustainable Wood in China”, 26-27 April 2007, Beijing.

### **2.3. Impacts Created: Inputs into Major Policy Processes**

At the International Seminar for Tackling Illegal Logging, 2007 II, the recommendations made by IGES on definitions and criteria for sustainable timber were discussed by government officials.

### **2.4. List of Publications**

Hyakumura, K. and F. Lopez-Casero. *Media review*. For: Chatham House Indicators Project: Measuring the response to illegal logging. (forthcoming).

Lopez-Casero, F. and H. Scheyvens. 2007. *Japan's public procurement policy of legal and sustainable timber. Challenges and ways forward*. IGES.

Lopez-Casero, F. and H. Scheyvens. 2008. *Public procurement policies for legal and sustainable timber: How to strengthen Japan's policy*. Policy brief no. 7, IGES.

### **2.5. Self-evaluation**

#### **(1) Relevance**

Highly relevant: FC launched the research after learning that the Japanese government would revise its procurement policy to include timber legality and sustainability criteria.

#### **(2) Effectiveness**

Some of the research was designed in close consultation with government officials. The results of the research were brought to the attention of Japanese policy-makers.

#### **(3) Efficiency**

The research was mostly completed as planned, within a reasonable time frame, and additional work was undertaken. Publication of the survey on role and awareness of Japan's procurement agents was delayed to allow FC to focus on REDD+ research.

#### **(4) Outputs and Impact Created**

The results were published in a large research report and summarised in a policy brief. Stakeholders such as Chatham House expressed appreciation for the work.

### **2.6. Conclusion**

The research produced strong outputs, and opportunities to use these to influence procurement policy can be expected during the 5<sup>th</sup> phase.

### **3. Assessing and Strengthening the Role of Customs in Curbing the Trade in Illegal Wood**

#### **3.1. Objectives**

- Identify options for strengthening the role of customs and timber trade regulating agencies to prevent trade from being a driver of illegal logging.

#### **3.2. Major Activities**

FC was contracted by The Nature Conservancy to conduct research on frameworks to promote collaboration between customs agencies to combat the trade in illegal timber. The research activities were (i) a literature review and interview surveys with customs experts in Japan, Indonesia, the Netherlands and the World Customs Organisation, (ii) presentation of the research results to forestry and customs experts at a two-day peer review workshop in Bangkok, and (iii) incorporation of feedback from the workshop into the final report.

FC co-organised the peer review workshop on Customs Collaboration to Combat the Trade in Illegal Timber, which was held on 28-29 October 2009 in Bangkok. Participants included forestry and customs officials from eight countries, as well as representatives of regional and international organisations, including the US Agency for International Development Regional Development Mission for Asia, the ASEAN Wildlife Enforcement Network, The Nature Conservancy, TRAFFIC, and the World Customs Organisation Regional Intelligence Liaison Office for Asia and the Pacific.

The research found that countries have clear procedures for the permitting of wood product exports, and some exporting countries now have wood product legality verification processes as part of their export permitting. However, the requirements of the exporting countries for the clearance of wood product consignments are not well known by customs agencies in importing countries. Information sharing is thus critical for more effective cooperation.

#### **3.3. Impacts Created: Inputs into Major Policy Processes**

The workshop recommended (i) encouraging ASEAN to establish a joint customs-forestry working group on illegal logging and to organise a workshop on collaboration between forestry, police and customs, and (ii) requesting the International Tropical Timber Organisation (ITTO) to support an Asian customs-forestry working group on illegal logging and trade. IGES and its partners are now discussing how to implement these ideas.

#### **3.4. List of Publications**

- TNC/IGES. *Report of the peer review workshop on Customs Collaboration to Combat the Trade in Illegal Timber, 28-29 October 2009, Bangkok*
- Scheyvens, H. and F. Lopez-Casero. 2010. *Enhancing customs collaboration to combat the trade in illegal timber*. IGES/TNC.

### **3.5. Self-evaluation**

#### **(1) Relevance**

Highly relevant: Illegal logging remains a high priority of forest management in many countries of the region and forestry departments need the support of customs and other agencies to combat this problem.

#### **(2) Effectiveness**

The approach of having customs and forestry officials discuss the draft report at a workshop was an effective way of reviewing the report and identifying ways forward on the illegal logging issue.

#### **(3) Efficiency**

The work was completed in a reasonable time frame of six months.

#### **(4) Outputs and Impact Created**

The research report received good comments at the peer review workshop, and IGES has agreed with its partners to take the lead in drafting a policy brief based on the report.

### **3.6. Conclusion**

This work, which was funded by an international NGO (The Nature Conservancy), is evidence of growing confidence that our international partners have in IGES.

## **4. Analysis of REDD+ Projects and National REDD+ Systems**

### **4.1. Objectives**

- REDD+ projects: Extract lessons from the analysis of REDD+ projects for the development of national emissions reduction programmes and the international negotiations.
- National REDD+ systems: To identify the relative strengths and weaknesses in the different approaches that countries in the Asia-Pacific region are taking to develop their national REDD+ systems, and to identify gaps and the best options for filling these.

### **4.2. Major Activities**

#### *REDD+ Projects*

The research studied the design of 3 REDD+ projects in Indonesia and Cambodia. Local experts were commissioned to undertake the studies with the support of FC researchers. The methodologies included literature reviews, field surveys, and interviews with key informants.

A threat common to the implementation of the 3 REDD+ projects is weak forest governance,

which could result in the non-permanence and displacement (leakage) of the emissions. Weak forest governance is the result of a number of factors, among which the most salient are (i) weak rule of law, (ii) weak organisational capacity to implement existing institutions, and (iii) lack of inter-agency collaboration to develop and implement a comprehensive land use policy.

FC presented its research at the following events

- The Asia Forests Partnership Dialogue “REDD and Combating Illegal Logging”, May 2009 Bali (co-organised by IGES).
- Annual meeting of the ASEAN Social Forestry Network, 2009, Manila.
- Conference on “Climate Insecurities, Human Security and Social Resilience”, 27- 28 August 2009, Singapore.
- “IGES policy forum on Bali to Copenhagen: Asia’s Role in Climate Regime Beyond 2012”, 9-10 October 2008, Kyoto.
- Workshop on “Implications of Alternative Proposals for Integrating REDD into the Global Climate Protection Regime”, 24 June 2008, Tokyo (co-hosted).
- Seminar on “The possible impact of REDD implementation in rural areas”, 21 May 2008, Tokyo.
- “Japan-Asia REDD Seminar”, 24-25 March 2008, Hayama (co-hosted).
- IGES Roundtable on Avoided Deforestation, 28 September 2007, Tokyo.

#### *National REDD+ systems*

FC research focused on the development of national REDD+ systems in Indonesia, Viet Nam, Laos and PNG. National reviews were undertaken by FC researchers and local experts. The reviews found that the question of whether any country will be “REDD+ ready” by 2012 is less important than (i) putting in place an effective cross-sectoral policy and administrative framework that brings together ministries whose decisions impact deforestation to work towards the goal of reducing national forest emissions, and (ii) providing sufficient resources for a fundamental review of the performance of existing forest management policies in order to establish an effective national REDD+ strategy.

#### *National REDD+ capacity building workshops*

National REDD+ capacity building workshops were conducted in Cambodia, Viet Nam, Indonesia and PNG with the support of local partners. The three-day workshops aimed to build the capacity of government and non-government stakeholders to participate in the formulation of national REDD+ policy and in implementing REDD+ projects. The issues covered included the state of international REDD+ negotiations, development of national REDD+ policy, REDD+ concepts (leakage, permanence, additionality), and stakeholder analysis.

#### *REDD+ online database*

In FY2009, IGES developed a REDD+ project online database and drafted six project profiles. The purpose of this database is to make information on REDD+ readiness activities and projects easily available to support efforts to achieve climate change mitigation through sustainable forest management. The database provides country summaries of REDD+ policy and framework, and project profiles.

#### *Others*

FC researchers participated in international fora relevant to REDD+, such as Forest Day 3, the

15<sup>th</sup> COP, and the International Workshop on Innovative Financial Mechanisms organised by the Secretariat of the Convention on Biological Diversity. A report on the US approach to using REDD+ as an offsetting option was completed.

#### **4.3. Impacts Created: Inputs into Major Policy Processes**

Participants at the workshop in PNG developed a strategy for moving forward towards an effective national REDD+ policy and identified tasks for each of their organisations. The impacts of this process now need to be monitored.

#### **4.4. List of Publications**

- Hyakumura, K. 2008. Possible impact of REDD implementation in rural communities, *Global Net* 211, 31-33
- Hyakumura, K. 2009. Examination of effectiveness of co-benefits under REDD pilot project in Cambodia, *Paper on Environmental Information Science* 23, pp. 499-504.
- Hyakumura, K. 2009. Global Warming and bio-diversity, forest certification and REDD as a forest conservation measure, *Basic knowledge of Biodiversity ecosystem and Economics*, Chuo Hoki Publishing.
- Scheyvens, H. 2009. Preparing for REDD: Lessons from the Indonesian experience. IGES Working Paper.
- Scheyvens, H., K. Harada and F. López-Casero. 2008. Reduced emissions from deforestation and forest degradation in developing countries: Risks and opportunities for rural communities in the Asia-Pacific region. In: H. Hamanaka, A. Morishima, H. Mori and P. King. *Climate change policies in the Asia-Pacific: Re-uniting climate change and sustainable development*. IGES White Paper, pp. 79-104. Institute for Global Environmental Strategies (IGES). Hayama, Japan.
- Ibarra, E. 2010. REDD (Reduced Emissions from Deforestation and Forest Degradation): Mitigation, adaptation and the resilience of local livelihoods. In: M. Caballero Anthony and L. Elliot. *Human security and climate change in Southeast Asia: managing risk and resilience*. Routledge.
- Hyakumura, K. 2010. Achieving role and issues of REDD implementation at village level – case study in Cambodia, *Forest Management System in Tropical Asia and People*, 206-221. Jinbun Shoin Publishing.

#### **4.5. Self-evaluation**

##### **(1) Relevance**

Highly relevant: The Copenhagen Accord emphasises the role of REDD+ to achieve climate change mitigation. FC could contribute to this by providing independent expert assessment of both demonstration activities and national REDD+ policy and readiness activities.

##### **(2) Effectiveness**

FC learnt important lessons for how it can make its work on REDD+ more effective. The monitoring and assessment of REDD+ demonstration activities allowed FC to build expertise to undertake action research with local communities on methodological issues in the 5<sup>th</sup> phase, which responds to a call from SBSTA to have communities and indigenous people participate in monitoring

and reporting.

Lessons were learnt from the national REDD+ capacity building training workshops. The participants took part enthusiastically in various exercises, such as stakeholder analysis, indicating that the material and methodology of the workshops were appropriate. However, the number of participants at some workshops could have been larger if the workshop planning process had been started earlier.

### ***(3) Efficiency***

Average/fair. The six project profiles and the design of the database were completed at a steady pace, but the report on national REDD+ systems and on REDD demonstration activities were delayed, partly because some of the work FC commissioned to local experts was delayed and required a lot of editing and additional work.

### ***(4) Outputs and Impact Created***

The number of outputs is relatively low, but a major report on national REDD+ systems and a paper on demonstration activities are near completion.

## **4.6. Conclusion**

IGES has established REDD+ as a priority for research. FC REDD+ research outputs, the REDD+ capacity building workshops, and the REDD+ online database can be expected to further raise appreciation of IGES work on this issue.

## **Other Research/Activities, Events and Publications**

### **Research/activities**

#### **1. Forest Regulatory Frameworks**

FC conducted a critical review of forest regulatory frameworks and their implementation in selected Asia-Pacific countries. Local experts were contracted to research forest-related law reforms in India, Malaysia, Russia, the Philippines and Thailand. Their reports analyse the regulatory reforms from a rights perspective, reflecting on implications for forest-dependent people, taking into consideration law-making, law content, and law enforcement. The laws reviewed were: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 – India; Community Forest Act (2007) – Thailand; Revisions to the Land Code (1958) – Sarawak; Indigenous Peoples' Rights Act (1997) – Philippines; New Forest Code (2006) – Russia. Publication of the research is planned in FY2010.

#### **2. Planted Forest Models**

Research was undertaken on planted forest models in the former centrally planned economies, focusing on the role of local people and how they are impacted by tree planting programmes. The report is based on an extensive literature review and field studies in Laos, Viet Nam and China, and

will be published in 2010. The outputs in the 4<sup>th</sup> phase were:

Hyakumura, K., Y. Seki, F. Lopez-Casero. 2007. Designing forestation models for rural Asia: Avoiding land conflict as a key to success. IGES Policy Brief #6.

Hyakumura, K., Y. Seki, F. Lopez-Casero. 2010. The comparative study on forestation programme in developing countries of Asia: From the view point of securing right of local people, *Forest Economy* 62(11), 1-20.

### 3. APFED

FC researchers supported APFED showcase projects in Viet Nam and Cambodia, and assessed APFED Award projects in Nepal, India and Kanazawa, Japan. The report on the project in Nepal was published as:

Lopez-Casero, F. 2009. From shifting cultivation to sustainable livelihood creation: Strengthening marginalised communities through institutional development and microfinance for agroforestry and energy-efficient technologies. IGES.

### 4. ICCPL

FC Project was responsible for monitoring and reporting on the LULUCF sector actions under the Indonesia Climate Change Program Loan.

### 5. Microfinance, Adaptation and Biodiversity

FC researchers were instrumental in launching and conducting an IGES Strategy Fund study on microfinance, adaptation and biodiversity in Laos, Nepal and Bangladesh. FC completed two village surveys in Nepal on the role of microfinance in assisting farmers in establishing irrigation technologies, focusing on the implications for adaptation to more severe drought events. The research was discussed at the Microfinance Summit Nepal 2010.

#### Events

- Co-hosted 7th Meeting of the Asia Forest Partnership (November 2007);
- Co-organised "Timber Trade, Forest Law Compliance and Governance" session of Asia-Pacific Forestry Week, 21-26 April 2008, Hanoi; presented on consumer country responses to illegal logging.

#### Publications

Yangfang, T. 2008. China's imports of Russian timber: Chinese actions in the timber commodity chain and their risks of involvement in illegal logging and the resultant trade, Project Occasional Paper #2.

Kono, Y., M. Kato and K. Hyakumura. 2008. Continental Southeast Asia rainforest and rural ecology, in Anthology of Ecological History in Monsoon Asia - Connecting the local with the global. Koubundou Publishers.

Hyakumura, K. 2008. Use of renewable energy. Forest Discoveries: Natural Forest Regeneration Centre News. Vol. 10.

AFP Evaluation Working Group (Scheyvens, H. et al.). 2007. *Asia Forest Partnership phase 1 assessment and recommendations for phase 2*. AFP.

Scheyvens, H., F. Lopez-Casero, E.I. Gene and K. Hyakumura. *Reforming the tropical forest products trade towards sustainable consumption and production*. Chapter for 3<sup>rd</sup> IGES White Paper.



# Freshwater Project

## Enhancing Access to Safe Water through Innovative Water Quality Management

The overall objective of this project is to strengthen water quality management through innovative policy measures, and thereby to enhance the accessibility of water resources in Asian countries by increasing the volume of “available water resources”, which contributes to the attainment of the Millennium Development Goals (MDG) regarding safe water supply. The research of this project in FY2008 focused on two areas, namely “Groundwater Quality Management for Increasing Available Safe Water Sources (SWMP II)” and “China-Japan joint research to strengthen Water Environment Management in China (WEMAC)”. The project served as the secretariat of the “Water Environment Partnership in Asia (WEPA)” and contributed to strengthening of the network of WEPA partner countries through information collection and sharing.

## 1. Enhancing Access to Safe Water through Innovative Water Quality Management

### 1.1 Objectives

The ultimate objective of this research component is to strengthen water quality management through innovative policy measures, and thereby to enhance the accessibility of water resources in Asian countries by increasing the volume of “available water resources”, which contributes to the attainment of the Millennium Development Goals (MDG) regarding safe water supply. To this end, case studies on the status of groundwater quality and its management were conducted in Bandung (Indonesia), Bangkok (Thailand), Kandy (Sri Lanka), Ho Chi Minh City (Viet Nam), and Tianjin (China).

### 1.2 Major Findings

Focusing on groundwater quality, the case studies found that each case study city faces problems in groundwater quality, but countermeasures against the problems are not well implemented or appropriate. An insufficient data set was identified to be a significant challenge of groundwater quality management.

### 1.3 Impacts Created

The research provided detailed information on groundwater quality and its management for each case study. Such detailed information was appreciated by the groundwater community, such as that presented in a session on groundwater at the 5<sup>th</sup> World Water Forum in Istanbul, Turkey in March 2006.

The freshwater project was approved as the knowledge hub on groundwater in June 2009 in Singapore by the Steering Committee of the APWF. This new development will allow IGES to create more impacts on international water dialogues in the 5<sup>th</sup> strategic research phase.

## **1.4 List of Publications**

### **Report:**

- Case study report on groundwater quality and its management

### **Presentations at conferences:**

- Second International Symposium on Food and Water Sustainability in Asia 2008 (7-8 October 2008, Macau), organised by the Transdisciplinary Initiative for Global Sustainability (TIGS) University of Tokyo and University of Macau
- Symposium on “Sustainable Water Resources Management in Asia” (27 February 2009, in Tokyo), organised by the Science Council of Japan
- A session on groundwater management (tentative session title: A hidden resource: Sustainably managing groundwater for the future) at the 5th World Water Forum (20 March 2009, Istanbul)
- Keynote presentation “Sustainable groundwater management in Asia” at the conference commemorating the 50<sup>th</sup> anniversary of the establishment of the Japanese Association of Groundwater Hydrology (29 May 2009, Tokyo)

### **Contribution to the capacity development programme (providing a lecture):**

- JICA training course “Integrated Water Resource Management” (Tokyo)
- JICA training course “Integrated Water Resource Management Course for Iran” (Tokyo)

### **Journals:**

Kataoka, Y. “State of groundwater management in Asia and future research agenda for groundwater management policy”. *Journal of Groundwater Hydrology* Vol.52 No.2 (Feb 2010), Japanese Association of Groundwater Hydrology (in Japanese).

## **1.5 Self-evaluation**

For this component, the state, countermeasures and challenges of groundwater quality management were analysed based on detailed information, which was initiated based on the assets of groundwater research conducted in the 3<sup>rd</sup> strategic research phase. For selection of topics (problems) in each case study city, we ensured the match of local policy needs and our research agenda through discussion with local research partners and policy-makers. Local partners played important roles in conducting the case studies, which promoted collection and analysis of local information effectively. The importance of tackling groundwater problems is widely recognised, but there is not much policy related research on groundwater based on information on “what really happens on the ground”. This research component provided useful information available in the target cities to enhance groundwater management study in the future. Because of limitations to human resources, the situation analysis of case studies could not be completed within this phase. This issue should be considered in the planning and implementation of research in the 5<sup>th</sup> phase.

The most important achievement of the freshwater project was that the project was approved as the regional hub on groundwater management under the Asia-Pacific Water Forum (APWF). This fact shows that the past research activities of IGES were well received by APWF. By being the knowledge hub, IGES will have more opportunities to provide inputs to regional policy processes such as APWF.

## **1.6 Conclusions**

The Fourth Phase research in groundwater management achieved a certain success in terms of identification of conditions and issues in each case study city focusing on water quality. The case studies also revealed some challenges for future groundwater quality related research, such as insufficient data availability and unclear or unidentified casual relationships between suspected causes and emerged issues. IGES will be expected to further promote its activities as the knowledge hub in the area of groundwater management in the Asia-Pacific region. It has become more crucial for IGES to collect and accumulate information on groundwater and propose measures for efficient use of groundwater by strengthening collaboration with related institutes in and outside Japan.

## **2. Water Environment Partnership Project between China and Japan (China-Japan joint research to strengthen water environment management in China (WEMAC))**

### **2.1 Objectives**

This project has been conducted since FY2006 as a project commissioned by MOEJ based on an agreement between the governments of China and Japan, in order to address the deficiencies of the current water quality management policy framework for urban areas, where more strategic and comprehensive management is needed given rapid development. The project has been carried out since FY2008 in order to achieve the following purposes, based on the results of field surveys conducted in 2007 and an agreement among the ministers of both MOEJ and Ministry of Environmental Protection of China.

- To identify policy issues and formulate recommendations for the Chinese government on the development of domestic wastewater treatment systems in rural areas through a demonstration study
- To develop the capacity of Chinese government officials who engage in water environmental management

### **2.2 Major Findings**

#### ***(1) Necessity of domestic wastewater treatment in rural areas of China***

The volume of domestic wastewater exceeded industrial wastewater in 1999, and this difference in volume has been expanding every year since. Therefore, the promotion of domestic wastewater treatment systems is one of the most important policy issues in China. The Chinese government has constructed sewerage systems with priority given to urban areas. As a result, the sewerage service ratio in urban areas has increased from 19 percent in 2001 to 66 percent in 2008. However, domestic wastewater currently discharged from rural areas is not generally treated in China. According to a survey conducted by the Ministry of Housing and Urban-Rural Development of China, the percentage of villages with domestic wastewater treatment systems was only four percent. Because rural areas account for a larger population than urban areas, rural areas are expected to discharge a greater volume of domestic wastewater. In addition, the volume of wastewater discharged from each household in rural areas is expected to increase gradually along with the improvement of living standards as a result of the New Village Construction Program instigated by the Chinese government. Therefore, it will be vital to provide treatment of domestic wastewater discharged from rural areas in the near future.

## ***(2) Points to be considered in planning a wastewater treatment system***

Through a literature review and discussions with Chinese counterparts, the following points were identified as key points for the development of a domestic wastewater treatment system in rural China. In the demonstration study, pilot facilities were constructed considering these points. After the construction of pilot facilities, monitoring will be conducted during the operational phase, looking at the performance of the facilities, methodology and status of wastewater treatment fee collection, and situation of operation. This will be performed in order to identify whether the applied facilities will be feasible for the constructed area with regards to technology, finance and management.

### ***<Various natural and socio-economic conditions>***

Because China is a very large country, natural conditions such as rainfall and temperature vary among regions. Therefore, technology suitable for the natural conditions of the area should be selected. However, because economic levels also differ among places, not only natural conditions but socio-economic conditions should also be considered for the selection of applied technology. In the demonstration study of this research, various kinds of technologies were applied in different places with various natural and socio-economic conditions.

### ***<Lower population density in rural areas>***

A central treatment system which collects wastewater from a broad area and treats it at one plant is mainly applied to urban areas. On the other hand, a decentralised treatment system is supposedly suitable for rural areas where houses are distributed in a patchy fashion. This decentralised system can reduce the construction cost of unnecessary pipelines for wastewater collection. However, because this decentralised wastewater treatment system is due to be operated with limited cost and staff, some troubles will be expected during the operation phase.

### ***<Lower household income level than urban areas>***

Operational costs of wastewater treatment facilities in rural areas should be set at a reasonable level for the rural households whose income level is lower than in urban areas. According to a survey conducted in 2008, annual household incomes in urban areas of China's main cities in 2007 ranged from 9,542 CNY (1,224 USD) to 26,729 CNY (3,428 USD) and the collected domestic wastewater treatment fees ranged from 0.15 CNY/m<sup>3</sup> (0.02 USD/m<sup>3</sup>) to 1.2 CNY/m<sup>3</sup> (0.15 USD/m<sup>3</sup>). On the other hand, annual household incomes in rural areas were lower than urban areas, ranging from 2,677 CNY (343 USD) to 11,680 CNY (1,498 USD). Based on these results, the affordable operational costs in rural areas were estimated to be less than the range of 0.6 CNY/m<sup>3</sup> (0.08 USD/m<sup>3</sup>) to 0.7 CNY/m<sup>3</sup> (0.09 USD/m<sup>3</sup>). Therefore, in the demonstration study, facilities for which operational costs were expected to be less than 0.6 CNY/m<sup>3</sup> were constructed.

### ***<Changing conditions for sludge management>***

Currently, most of the human waste generated from households in rural areas of China is used as fertiliser after storage. For the effective use of such a valuable resource, sludge generated during domestic wastewater treatment should also be used as fertiliser. However, there has been a marked

decrease of cultivated land together with an increase of chemical fertiliser consumption in China as a whole, including urban and rural area.

### **2.3 Impacts Created: Inputs into Major Policy Processes**

#### **<Inputs to policy dialogue between MOEJ and Ministry of Environmental Protection of China>**

The cooperative system on water environmental protection between Japan and China was strengthened through policy dialogue between MOEJ and the Ministry of Environmental Protection of China, into which the results of this project were input.

#### **<Impacts to the government of China >**

Progress and results were presented at two international seminars held in Beijing. Many experts of central governments, local governments, private companies, universities and research institutions in both Japan and China who engage in water environment related issues participated in these seminars and discussed intensively about the challenges for strengthening water environmental management in China.

Domestic wastewater related issues in rural areas, which are the focus of this project, will be addressed as a new policy topic in the "12th National Five-Year Plan for Environmental Protection".

### **2.4 List of Publications**

- Commissioned report to MOEJ, March 2008 (Japanese)
- Commissioned report to MOEJ, March 2009 (Japanese)
- Presentation at the "Japan-China Seminar on the Total Pollutant Load Control, and the Technology and Management of the Decentralised Wastewater Treatment in Rural Area", Beijing, December 2008 (in Japanese and Chinese)
- Presentation at the "3rd WEPA International Forum on Water Environmental Governance in Asia", Malaysia, October 2008
- Presentation at the "Japan-China Seminar on the Total Pollutant Load Control, and the Theory and Practice of the Decentralised Wastewater Treatment in Rural Area", Beijing, November 2009 (in Japanese and Chinese)
- M. Mizuochi, H. Koyanagi, T. Kuyama, H. Iwasaki. 2009. Importance of Domestic Wastewater Treatment in the Rural Area of China and Japan-China Cooperation. *Journal of Sewerage, Monthly*. June, 2009, Volume 32, No.7 p59-63 (in Japanese).
- Feasibility Study on Decentralised Wastewater Treatment Technologies in Rural Area of China, The 7th International Symposium on Southeast Asian Water Environment (Poster Session), Bangkok, October 2009
- Development of Low-Cost Domestic Wastewater Treatment System in the Rural Area of China, The 5th Kitakyushu Initiative Network Meeting (KIN5), Kitakyushu, February 2010

### **2.5 Self-evaluation**

This project has been conducted as a project commissioned by MOEJ since FY2006 based on an agreement between the governments of China and Japan, in order to address the deficiencies of the

current water quality management policy framework for urban areas, where more strategic and comprehensive management is needed given rapid development. This project was started based on the assumption that research on water quality management was required for urban areas of China, where rapid development is being achieved. However, through field surveys, water quality management for rural areas was identified as a future risk and a political issue prioritised by the Chinese government. Therefore, we changed the research area from urban areas to rural areas during the 4<sup>th</sup> phase. This decision was evaluated positively because the project was able to conduct policy research based on the latest situation and prioritised policy issues by changing the research area. Moreover, this project was able to improve the quality of research by focusing on different aspects of water quality in rural areas, such as technological, legal and socio-economic aspects.

This project innovated research methodology to implement model projects of decentralised domestic wastewater treatment in rural areas and prepare policy recommendations for the Chinese government based on the issues identified during and after the model projects. Although ten model projects in different areas of China were to be conducted in three years time, the projects were able to be completed in a short period of time based on the cooperation system among different institutions concerned in China and Japan. The establishment of the “cooperation system” was a key for success of this project, and it will serve as a valuable resource for IGES in the future. It was also significant that this research, oriented on model projects, could analyse issues and produce policy recommendations based not on desk theory but actual facts obtained in the field. This methodology is believed to be a good model for IGES to implement projects, not as a “Think Tank” but as a “Do Tank” in the future.

However, because this project was developed as research focusing on only Chinese issues, it might be operated more effectively if its main management was moved from the Freshwater Project to the Beijing Office. This issue will be discussed in the 5<sup>th</sup> phase.

The impact this project had on Japan and China during the 4<sup>th</sup> phase was quite significant, although the issue of how the experiences of this project should be disseminated to other countries in the Asian region remains. At first, the results of this project were input into policy dialogue between MOEJ and the Ministry of Environmental Protection of China. Thereby, the cooperative system on water environmental protection between Japan and China was strengthened. In addition, domestic wastewater related issues in rural areas, which are the focus of this project, will be also addressed as a new policy topic in the “12<sup>th</sup> National Five-Year Plan for Environmental Protection”. The Ministry of Environmental Protection plans to prepare standards or guidelines for decentralised domestic wastewater facilities for rural areas while utilising the results of this project as a reference.

## **2.6 Conclusion**

It was a great success that this project could achieve its original objective to formulate valuable recommendations for the Chinese government on water quality management in China. This project is planned to continue in the 5<sup>th</sup> phase. The cooperation system established in the 4<sup>th</sup> phase will serve as a key human resource for the 5<sup>th</sup> phase. It is believed that IGES will show dedication to other Asian regions by utilising experience and knowledge obtained by this project in the 4<sup>th</sup> phase.

### **3. Water Environment Partnership in Asia**

#### **3.1 Objectives**

The objective of WEPA is to promote good governance in water environmental management by providing necessary, relevant information and knowledge, as well as capacity development opportunities, to the WEPA partner countries.

WEPA partner countries are Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Republic of Korea, Thailand and Viet Nam. Nepal and Sri Lanka were approved to be the partner countries of WEPA at the WEPA annual meeting in FY2009. This project was commissioned by the Ministry of the Environment, Japan.

#### **3.2 Major Activities**

- bilateral meetings between Japan and WEPA partner countries (Cambodia, Malaysia, Indonesia)
- WEPA International Forum (Japan, Malaysia, Viet Nam)
- Basic information on water environmental policy and laws are collected and provided by the WEPA database.
- Presentation on the progress of WEPA at a session of the 5<sup>th</sup> World Water Forum in Istanbul, Turkey, March 2006
- FY2009, WEPA stated its second phase activities. IGES contributed to development of the framework of action of WEPA in which climate change and integrated water resource management are the major foci of discussion among WEPA countries.

#### **3.3 Impacts Created**

- Presentation at the 5<sup>th</sup> World Water Forum
- Focal points of each WEPA partner country, who are government officials in charge of water environmental policy planning and implementation, can utilise the information and knowledge (e.g. water environmental management policy in each country and its challenges) through WEPA.

#### **3.4 List of Publications**

- Oral Proceedings, the 2<sup>nd</sup> WEPA International Forum on Water Environmental Governance in Asia
- Oral Presentation Proceedings, the 3<sup>rd</sup> WEPA International Forum on Water Environmental Governance in Asia
- The Outlook of Water Environment Management and Strategies
- Proceedings, The First International Workshop – Coping strategies for water environmental challenges in Asia (March 2010)
- Updated WEPA Database
- WEPA brochure
- Commission report to the Ministry of the Environment, Japan for FY2008
- Commission report to the Ministry of the Environment, Japan for FY2009

### **3.5 Self-evaluation**

IGES contributed to WEPA as the Secretariat, and by enhancing the human network of WEPA focal points, who are in charge of water environmental policy-making and implementation. IGES also contributed by collecting and organising the information related to water environmental governance of each partner country (such as information related to water environmental policy, measures taken, and information related to CBO activities and technologies). The collected information is shared through the Internet in the form of the WEPA database. Bilateral meetings between partner countries and Japan were conducted to promote information collection on water environmental policy and identify future challenges.

The final fiscal year of the 4<sup>th</sup> Strategic Research Phase is the first year of the 2<sup>nd</sup> phase of WEPA. Considering the fact that analysis of collected data in the 1<sup>st</sup> phase was not sufficient, since the project concentrated on collection of data for the WEPA database, the 2<sup>nd</sup> phase of WEPA will focus on information sharing and analysis on specific topics among partner countries. These topics include: climate change impacts on the water environment and adaptation measures; appropriate management of urban wastewater; and integrated water resource management. Analysis of the status of water environmental governance will also be implemented under the 2<sup>nd</sup> phase of WEPA, and the findings of the analysis will be discussed among WEPA partner countries. Such discussion is expected to provide opportunities to improve water environmental governance in each WEPA country. IGES should take the role to promote such discussion based on good research outputs.

### **3.6 Conclusion**

The immediate goal of the 1<sup>st</sup> phase of WEPA, to develop the WEPA database as an information platform to help in the improvement of water environmental governance, was successfully achieved. In the 2<sup>nd</sup> phase WEPA, IGES can play a role to promote discussion on specific topics among WEPA countries, based on the human network built through past WEPA activities.

# Waste and Resources Project

The Waste and Resources project started at the beginning of the 4<sup>th</sup> research phase of IGES in April 2007. At that time the project team consisted of three regular researchers and a part-time assistant. At the end of the 4<sup>th</sup> phase, the team has expanded to four regular and three visiting researchers, two associated fellows and a full-time assistant. In FY 2009, the project attracted over 90 million yen in external funding from a variety of sources.

The activities of the project focused on the following four broad areas: benefits of community-based waste management, national capacity development for recycling, opportunities and challenges of regional recycling, and chemicals management for sound end-of-life treatment of products. There are strong linkages among these areas and in order to assure good integration, most project members are involved in more than one area.

## 1. Capacity Development for Community-Based Waste Management

This component was initially carried out by the IGES Kitakyushu Office, but gradually the WMR project has built up capacity to conduct independent research. The activities conducted by the Kitakyushu Office are reported in a separate section of the progress report.

### 1.1. Objectives

- to identify appropriate governmental intervention and institutional settings for capacity development in response to changing roles of related stakeholders in recycling and solid waste management along with socio-economic development trends in developing countries;
- to provide useful inputs to national strategies for capacity development.

### 1.2. Major Findings

The WMR work on this component started in 2008, and it currently has funding available until 2011. The research focuses on organic waste management, the largest component of the solid waste stream in developing countries. Improper management of this waste is causing local hazards and nuisance, and also contributes to global warming. However, organic waste has the potential to be utilised as a resource for animal feed production, composting, biogas generation, and so on. Thus it could contribute to food and energy security, which is a concern of developing Asian countries. In addition, source separation of organic waste can increase the recovery of recyclable materials (metals, glass, etc.) from the waste stream. Overall, better management of organic waste could help reduce waste flows to final disposal sites, as well as reduce the expenses of local governments. The research under this component, which included literature reviews, discussions with national and local government officials, as well as field studies in selected countries, generated a number of findings and recommendations as follows:

1. Improvement of final disposal is urgent. A common solid waste treatment practice in developing Asian countries is open dumping, and sometimes open burning is applied. These practices

produce bothersome smells and air pollution. In some cases, houseflies and other insects and pests are a serious problem affecting the health and quality of life of residents.

2. Capacity building for local governments is essential. Based on our interviews, personnel in charge of solid waste management in many cities, especially in the least developed countries, do not understand how to manage waste. Their education background is often not relevant to the environment and solid waste management; for instance, an accountant can become the head of the solid waste management department of a city. In addition many of them have not received any special training for this work.
3. Waste reduction, reuse and recycling should be promoted. Waste generation is increasing while the capacity of local governments to collect and dispose wastes is limited. An example is Vientiane, capital of Lao PDR, where the local government has not been able increase its waste collection rate since 1998 due to financial constraints. Currently trucks and equipment are out of date, thus it is expected that the waste collection service in the city will gradually worsen.
4. Waste separation at the source should be promoted to reduce waste flow to the dumpsite. Recently, a lot of sellable materials are found at dumpsites because there are only a few residents practicing waste separation at the source. At minimum, three categories of waste should be separated: i) sellable materials, ii) rapidly degradable waste, and iii) other wastes. Residents can sell sellable materials or donate them to waste pickers. The rapidly degradable waste should be utilised as animal feed, compost, biogas, and so on. These practices can provide benefits to residents, as well as reduce greenhouse gas (GHG) emissions. Once the “sellable materials” and the “rapidly degradable waste” are handled by the aforementioned practices, local governments need to collect and dispose only the “other wastes”, which typically constitute less than 50 percent of entire waste. To promote these activities, local governments request pilot projects for their learning.
5. Involvement of the private sector and NGOs in solid waste management should be encouraged to reduce the burden on local governments. A good case is Phnom Penh, Cambodia, where the city engages a private company for waste collection. The company charges waste collection and disposal fees to residents but collects the fee in cooperation with the electric department of the city. Thus, all residents now pay for waste management, while in many cities in the region less than 50 percent of residents pay for these services. In addition, the city allows an NGO (COMPED) to collect food waste from markets for composting. In the coming year, cooperation between the private company and the NGO will be started to reduce waste flows to the dumpsites (reduce costs of the private company) and increase composting of the NGO. However, waste separation at the household level is not yet well promoted in this city.
6. Recycling businesses should be supported to reduce waste flows to disposal sites. A good case is Phitsanulok municipality, Thailand, where the city was able to reduce waste flow to a disposal site from 142 tons per day in 1996 to 82 tons per day in 1999 by promoting separation of sellable waste. For this activity, a private company (Wongpanit) was heavily involved, thus a market for the recyclables was secured. This activity created extra income for children and residents. In addition, the activity in this city was able to improve the quality of life of scavengers, upgrading them from scavengers to waste buyers and some could even become junk shop owners. This model has been replicated in many cities in Thailand.
7. Schoolteachers and students should be involved in waste management. In many cities, local governments and NGOs, in collaboration with schools, encourage students to practice

separation of sellable waste, composting and use of compost for vegetable cultivation. An example is the 'waste bank' system in Thailand. School students are encouraged to collect sellable waste from their homes and sell it to the waste bank in the school where waste buyers regularly come to buy the waste. Through this activity, students can earn extra income as well as learn to save money for their personal use. In addition, it has been found that children inform their parents and influence them to separate waste and dispose waste more properly. So, it is recognised that children can influence the behaviour of their parents.

8. A community-based solid waste management approach should be practiced by local authorities. This refers to a system where the public authority is encouraging active participation of residents and other local stakeholders in all processes related to solid waste management including planning, selection of technologies, implementation and operation, as well as monitoring and evaluation. This practice is being applied by Phitsanulok municipality, Thailand, and it is replicated in other cities as well.
9. Impacts of solid waste management on the global climate, as well as the potential contributions of waste management to development goals, including food and energy security as well as poverty reduction, need to be better clarified and more widely disseminated and understood. By highlighting the multiple benefits of improved treatment, public acceptance and the willingness of decision-makers to act can be enhanced.

For this component, further field surveys and analysis will be conducted in Cambodia, Lao PDR and Thailand. Based on this comprehensive review, a decision tool, implementation guidelines (in the local languages) and a training programme will be developed to assist the national and local governments to choose approaches suited to their conditions and needs. This activity is partially financially supported by the Asia-Pacific Network for Global Change Research (FY 2009-2010).

### **1.3. Impacts Created: Inputs into Major Policy Processes**

This component contributed improved external recognition of IGES as a strategic research institute on policy for solid waste management in developing Asia. For example, the work on climate co-benefits of the 3Rs, which started as a chapter of the second White Paper of IGES, is now linked with a research topic on benefits of the 3Rs in relation to the Regional 3R Forum in Asia. In addition, together with other units of IGES, WMR has supported national and local governments in the region in developing their guidelines and strategies on solid waste management and the 3Rs.

### **1.4. List of Publications**

*2009*

- Sang-Arun, J., Yamaji, E., Boonwan, J., and Bengtsson, M. 2009. Applying crop residues for soil improvement and climate change mitigation in northern Thailand: exploring the potential of schools and school children to act as local catalysts. In "*Soil Remediation*", Nova Science Publishing.
- Sang-Arun, J., and Bengtsson, M. 2009/09. Climate change mitigation potential of reduction, reuse and recycling of municipal solid waste in developing Asian countries. Proceedings of the Annual Conference of Japan Society of Material Cycles and Waste Management, Vol. 20. 2P.
- Sang-Arun, J., and Bengtsson, M. 2009/11. Improved Organic Waste Management: Climate Benefits through the 3Rs in Developing Asian Countries. IGES Working Paper 2009-001. 52P.

Sang-Arun, J., Yamaji, E. and Boonwan, J. 2009/12. Promoting plant residue utilisation for food security and climate change mitigation in Thailand. In "Sustainability in Water and Food: in Asian Perspective". Fukushi et al (eds). Springer. 8P.

*2008 (selected)*

Bengtsson, M., Sang-Arun, J., Maeda, T., and Tsydenova, O. 2008/06. "Urban Organic Waste: From Hazard to Resource". In *Climate Change Policies in the Asia-Pacific: Re-Uniting Climate Change and Sustainable Development*, pp. 133-157. Hayama. IGES.

Sang-Arun, J., Yamaji, E. and Boonwan, J. 2009/10. Promoting plant residue utilisation for food security and climate change mitigation in Thailand. Proceedings of the Second International Symposium on Food and Water Sustainability in Asia 2008. 7-8 October 2008. Macau. pp. 77-84.

Sang-Arun, J. 2008/11. Urban Organic Waste Management Option for Climate Change Mitigation in Developing Asia Countries. Presentation. At the JSPS-VCC Core University Program Seminar on Solid Waste Management, Kyoto University. 26 November 2008.

### **1.5. Self-evaluation**

This component was started one year later than other components. However, external funding was secured from an international donor organisation, and the funding will be continued into the fifth phase. Results were published in a numbers of publications and were distributed to policy-makers from developing countries of Asia through Asia 3Rs related events, international conferences, and the IGES website. This component brought attention to IGES work on the linkages between waste management and climate change.

#### **(1) Relevance**

Solid waste management is an environmental priority of cities in Asia. This component addresses issues related to this important waste stream. It develops policy proposals based on field studies and conducts training sessions in order to promote awareness and to improve the capacity of key decision-makers.

#### **(2) Effectiveness**

The work done under this component effectively contributed to meeting objectives.

#### **(3) Efficiency**

This component has been implemented with limited resources in terms of funding and staff time. In spite of this it has generated considerable output that has been very well received.

#### **(4) Output and Impact Created**

This research generated a number of publications which have had a big impact.

## 1.6. Conclusions

This component is successful in generating a number of publications in a short period of time, that were disseminated through a variety of channels, and in securing further funding for the fifth phase. Building on the achievement of the fourth phase, work on waste separation at the source, public participation, and several other topics will continue in the fifth phase.

## 2. National Recycling Capacity Development through Recycling-oriented Eco-industrial Park Policy (Later renamed as: National Recycling Capacity Development)

This component initially looked at recycling clusters or “eco-towns” as an approach to developing national capacity for safe and efficient recycling. The research aimed to identify enabling conditions for eco-town development in developing countries. The investigations included an evaluation and analysis of the experiences of Japan’s eco-town initiative and a study of recycling clusters in selected Asian countries. Activities included:

- Comparative analysis of recycling clusters in different countries in collaboration with institutes in the target countries;
- Interviews with local governments, industries and communities;
- Analysis of enabling factors or obstacles regarding recycling cluster developments.

### 2.1. Objectives and Key Activities

The original objectives of this component were:

- to identify an appropriate enabling environment for improving waste management and recycling capacity, focusing on recycling-oriented eco-industrial park (EIP) policies;
- to establish efficient and self-sustained nationwide material recycling mechanisms;
- to provide useful inputs to national strategies for capacity development.

In line with these objectives, WMR collaborated with Kitakyushu University in FY 2007 and 2008. This joint research included study visits to a number of recycling-oriented eco-industrial parks in Japan, South Korea, China and Thailand, as well as a review of the related policies in these countries.

In FY 2009, the scope of the component was broadened to policy development for recycling in general. This was a reflection of both the need for policy research on various forms of capacity development for recycling, not only through EIPs, and the lack of funding for the EIP study. With this new scope, WMR supported UNCRD and UNEP/RRCAP in facilitating the development of National 3R Strategies in six Asian countries. The project also participated actively in a Working Group on 3R Policies under ERIA and wrote a background report as input to UNEP’s report *Resource Efficiency: Economics and Outlook in Asia* (REEO).

## **2.2. Major Findings**

### 1. EIP Study

- It was concluded that the Japanese Eco-Town Programme increased the national recycling capacity greatly, but it relied on large governmental subsidies. Therefore, this policy approach was deemed to have limited potential to be transferred to developing countries;
- The establishment of EIP-type clusters of recycling companies is still at an early stage in Asian developing countries, and it was found somewhat premature to attempt an evaluation of such efforts;
- Data access was also found to be a major obstacle for quantitative assessments of the effectiveness of recycling-oriented EIPs;
- The existence of an established informal recycling sector in developing countries was identified as a major challenge for the establishment of a formal recycling industry;
- Collection of recyclable post-consumer waste has in many cases been found a far greater challenge than expected, and this part of recycling systems needs much more attention.

### 2. Recycling Capacity Development

- It was noted that proper recycling and increased resource efficiency require action by national policy-makers;
- However, it was found that efforts to increase capacity for recycling often put emphasis mainly on technical infrastructure without paying enough attention to the need for institutional changes and capacity development;
- It was also observed that most efforts to promote recycling do not address the full life-cycle of materials. For example, efforts to increase the markets for recycled materials are often lacking;
- Policy-makers' efforts also commonly suffer from a lack of coordination among the related ministries and other governmental institutions. In order to contribute to sustainable development, waste management policies need to be developed within the larger framework of sustainable materials management;
- At the local level, policy-makers need to develop their skills in building creative partnerships with stakeholders, including communities, NGOs and the informal and private sectors.

## **2.3. Impacts Created: Inputs into Major Policy Processes**

The results of this research have been presented to the Regional 3R Forum in Asia. This regional facility, which was established in 2009, brings together government officials from 17 countries and all major international organisations active in the field of the 3Rs in Asia. The input made to a major UNEP report on resource efficiency in Asia (the REEO report) also deserves to be mentioned in this context.

## **2.4. List of Publications**

2009

Bengtsson, M. 2009. Promoting the 3Rs in Asia: Regional Cooperation on Resource Efficiency. Presented at: *World Green Growth Conference for Eco-Industrial Park 2009*, Ulsan, South Korea, 21-23 October.

- Bengtsson, M., Hotta, Y., Hayashi, S. and Akenji, L. 2010. *Policy Tools for Sustainable Materials Management: Background Report to UNEP's REEO Report*. IGES. (Tentative title. To be published)
- Hotta, Y. 2009. Development of the Policy Concepts for Eco-Efficient Industrial Activities: 3Rs, Zero Emissions, eco-industrial parks, and others. In Kojima, M. and Damanhuri, E. (eds.), *3R Policies for Southeast and East Asia*, ERIA Project Research Report 2008 No.6-1, Jakarta. ERIA.
- IGES, UNCRD and UNEP/RRCAP. 2009. National 3R Strategy Development: A progress report on seven countries in Asia from 2005 to 2009.

*2008 (selected)*

- Liu, J., Matsumoto, T., Won, Y-E., Zhang, P., Ji, Y., Qi, Y., Soo, K. and Hyuok, L. 2008. Study on Comparison of Eco-Industrial Parks between Japan, China and Korea. *Journal of Global Environment Engineering*, Vol.13, pp.21-38.
- Matsumoto, T. and Liu, J. 2008. Investigation of the Development of eco-town projects in Asian Countries and Research on the Possibility of the transformation of the Experience from Japan. Kitakyushu University.

*2007 (selected)*

- Matsumoto, T., Liu, J., Koyanagi, H. and Ogihara, A. 2007. Status and challenges to develop resource circulation base in China: lessons through an international comparison of Qingdao and Kitakyushu. In: *Proceedings of the 35th Environmental System Research Presentations*, pp.135-141 (in Japanese).

## **2.5. Self-evaluation**

### **(1) Relevance**

Development of appropriate capacity for recycling is a priority for rapidly industrialising countries. National policies to this end can play a decisive role, and it is highly relevant to analyse how such policies can be designed and effectively implemented.

### **(2) Effectiveness**

Through the work done, IGES has positioned itself as a leading institute on recycling policies in Asia.

### **(3) Efficiency**

This component has been insufficiently funded in part, but nonetheless managed to generate results.

### **(4) Output and Impact Created**

A reasonable number of publications were generated, and the work of this component was fed directly into the development of national 3R strategies for six Asian countries as well as into discussions at the regional 3R forum.

## **2.6. Conclusions**

The development of this component illustrates the need for flexibility in project planning. It is in the nature of research that new findings will emerge underway, which may influence the direction of a project. The work done confirms that national policy frameworks and regulations can have a major impact on recycling systems. In developing countries, recycling is completely driven by economic factors and mainly carried out by an informal sector. These activities provide job opportunities and livelihoods to large numbers of people, but are also causing significant environmental and social problems. It stands clear that this is an area that continues to receive considerable attention amongst policy-makers as well as in academic circles.

## **3. Regional Recycling Framework Development**

This research aimed to identify the institutional mechanisms needed to establish a regional framework for efficient use of resources. The project contributed to the international process by carrying out various commissioned work for the MOEJ, such as drafting the Kobe 3R Action Plan agreed at the G8 Environmental Ministers Meeting in May 2008, and planning a new Regional 3R Forum in Asia in collaboration with ADB, UNCRD and MOEJ launched in November 2009. This component successfully contributed to secure two multi-year research funds for international collaborative research to analyse policies for sustainable resource circulation from FY 2009 to FY 2011, namely the "Asia Resource Circulation Research Promotion Project" and the "Policy Research on Environmental Economics" in collaboration with the EA team. Both of these international collaborative research projects are expected to contribute to the newly established Regional 3R Forum in Asia.

### **3.1. Objectives**

- to identify deficiencies in current regulatory frameworks and market mechanisms which prevent effective domestic recycling mechanisms;
- to identify enabling factors in the application of the Extended Producer Responsibilities (EPR) scheme in developing countries in the Asia-Pacific region in order to mitigate environmental pollution and health hazards stemming from inappropriate waste management and disposal and to enhance environmentally sound material flows and resource efficiency in product life cycles.

### **3.2. Major Findings**

1. Regionalisation and internationalisation of waste management, recycling and reuse-related challenges
  - The results of this component suggest that waste management and recycling have become regional or international issues; they can no longer be considered only in a national context (IGES 2008).
  - Results suggest that the regionalisation or internationalisation of waste and recycling issues is caused in large part by the steady advance of economic integration, especially increasing trade and investment flows resulting from trade and investment liberalisation (Hotta and Kojima 2008). Just as economic integration has separated the location of consumption from

the location of most efficient production, it has also separated the most efficient and effective location of recycling and reuse from the location of production and consumption.

- Also, increasing trade in second-hand goods make the issue more complicated. A policy framework for second-hand goods trade has not been sufficiently developed both nationally and internationally due to difficulties in distinguishing waste or second-hand goods (Aoki 2009 a. and b.). While the trade of waste, non-waste and second-hand goods might cause environmental health problems from informal recycling activities, the trade could create social and economic benefits, such as job creation and provision of affordable consumer goods. Thus this component suggests that policies should be developed through reviewing associated social, economic and environmental impacts with trade.
- It is difficult to operate domestically oriented recycling schemes, as demonstrated by the case of Japan (Hotta and Elder 2009).

## 2. Regional collaboration and harmonisation of policies to promote sustainable resource circulation in Asia

- National policies, although still important, are now insufficient. This component tried to demonstrate the need for regional collaboration and harmonisation of policies to promote sustainable resource circulation in Asia.
- In this context, to raise the awareness of policy-makers on the need for regional efforts, this component co-published a policy report with ADB on challenges and opportunities for increasing resource efficiency by sustainable resource circulation in Asia (ADB and IGES 2008).
- Towards further regional collaboration and harmonisation of policies to promote sustainable circulation in Asia, this component was actively involved in planning and negotiation of the Regional 3R Forum in Asia, which was launched in November 2009.

## 3. EPR-based policies in Asia

- This component also analysed introduction of EPR-based policies in Asia, as a case of policy efforts to strengthen resource circulation capacity in Asia, by taking international resource circulation into consideration (Hotta et. al. 2009).
- The study analysed EPR principles and their implications for Asia, analysed the current situation of introduction of EPR policy in Asia, covering mainland China, Thailand, India, Japan, Korea, and Taiwan, and discussed new challenges for EPR-based policy regarding international resource circulation.
- Firstly, it concluded that EPR is a general policy principle rather than a well-defined policy tool. Thus, policy-makers need to devise a package of regulations and supporting policy tools, suitable to country specific conditions. In developing such policy packages, economic aspects are key, and therefore appropriate incentives need to be carefully designed. Also, it is crucial to set regulations of environmental and health impacts of recycling and policies to facilitate the effective collection of end-of-life products from households. The government is expected to play a continuous and active role in revising the related policies and regulations.
- Secondly, for implementation of EPR, legislation should be supported by physical and organisational structures (including market) for collection, transportation, and recycling of used products. Otherwise, it is difficult to establish a formal sector which can be driven by financial and informative incentive from EPR policy.
- Finally, it concluded that effective implementation of EPR requires more than developing

legislation and establishing physical infrastructure; broad capacity development is needed.

- In so doing, multilateral and regional collaboration are expected to play an increasingly important role. The exchange of experiences among developing countries can be as important as the transfer of technology from North to South.
- In this sense, regional policy platforms on waste management and resource efficiency can be suitable forums for mutual learning for improved implementation of EPR. There is a need for international collaboration on issues related with national EPR systems and transboundary trade. A regional policy platform could be instrumental in addressing some of these issues.

#### 4. National capacity for Material Flow Accounting of selected non-OECD countries

- Since policies to promote resource circulation require target-setting based on proper data analysis of resource circulation and waste generation, the component conducted a brief survey on national capacity for Material Flow Accounting of selected non-OECD countries.
- It was concluded that although there is an increasing need for policy development supported by proper data analysis, there is still very limited capacity among developing countries.

### ***3.3. Impacts Created: Inputs into Major Policy Processes***

Under this component, the WMR project made two important inputs into major policy processes: drafting and negotiating the Kobe 3R Action Plan endorsed at the G8 Environmental Ministers Meeting in May 2008, as well as planning and negotiating the Regional 3R Forum in Asia, which was launched in November 2009.

By contributing to discussion materials of inter-governmental meetings, this component successfully positioned international resource circulation as a significant policy issue to be discussed in Asia and tried to propose some policy options on problems of WEEE, such as illegal trade and inappropriate recycling in Asia.

#### *Collaboration with the Asian Development Bank*

*Toward Resource-Efficient Economies in Asia and the Pacific*, a co-publication by ADB and IGES was developed to raise awareness of policy-makers on the need for increasing resource efficiency through sustainable resource circulation in Asia, and was circulated as discussion material from Asia for the G8 Environmental Ministers Meeting. By expecting a contribution to the Regional 3R Forum in Asia, the ADB is now preparing to launch a new project, for which IGES will act in a coordinating role.

#### *Contribution to Japanese government*

In FY 2007, this component contributed to MOEJ's studies to set new quantitative targets for the 2nd Fundamental Plan for Sound Material Cycle Society by conducting a series of surveys to the G8, OECD countries, and non-OECD countries. Also, this component contributed to Japan's Annual Report on the Environment in 2008 by providing results of surveys on the progress of the 3R-related activities in G8 countries and developing Asia. Also, in Japan's Annual Report on the Environment in 2009, the contribution from IGES was mentioned in relation to the efforts to establish an international sound material cycle society.

#### *New Multi-year Research Funds*

Also, this component successfully secured two multi-year research funds for international collaborative research to analyse policies for sustainable resource circulation from FY 2009 to FY 2011, namely the "Asia Resource Circulation Research Promotion Project" and the "Policy Research

on Environmental Economics” in collaboration with the EA team. Both of these international collaborative research projects are expected to contribute to the newly established Regional 3R Forum in Asia.

#### Others

Efforts have been made to increase the visibility of WMR’s research with some success by presenting research results at important international forums, firstly in the form of a co-published report with ADB, *Toward Resource-Efficient Economies in Asia and the Pacific*, secondly at an OECD-UNEP conference on Resource Efficiency.

Also, as planned for a few years in collaboration with the APFED team, this component supported the MOEJ in linking the agenda of the 3Rs and sustainable resource management by planning the Asia Regional Seminar for Sustainable Resource Management in March 2009. This makes IGES visible to the newly established international panel for sustainable resource management, which is said to be the IPCC equivalent for sustainable materials management issues.

### 3.4. List of Publications

#### 2009

- Hotta, Y., (2010), “Policy Challenges and Research Needs for a Sustainable Resource Circulation in East and Southeast Asia” to be published In Kojima, M. and Damanhuri, E. (eds.), *3R Policies for Southeast and East Asia*, ERIA Project Research Report 2009, Jakarta. ERIA.
- Hotta, Y., (2010) 「東アジア・東南アジアでの持続可能な資源循環へ向けた国際協力の方向性」 In 『日中対話 21世紀における日中環境協力の推進：循環型社会の構築に向けて』, Tokyo, Japan, Tokyo. The Global Forum of Japan.
- Hotta, Y., Hayashi, S., Bengtsson, M., and Mori, H. (eds.) (2009), *Extended Producer Responsibility Policy in East Asia – in Consideration of International Resource Circulation –*, Hayama. IGES.
- UNCRD, UNEP/RRCAP, and IGES (2009), *National 3R Strategy Development - A Progress report on seven countries in Asia from 2005 to 2009 –*, Hayama. IGES.
- Hotta, Y. and Elder, M. (2009), “Internationalisation of Waste and Recycling Related Issues and Its Implications for EPR-based Recycling Policy” In *Extended Producer Responsibility Policy in East Asia - in Consideration of International Resource Circulation –*, 115-130. Hayama. IGES.
- Aoki, C., Bengtsson, M., and Hotta, Y. (2009). “Trade of Second-Hand Electric and Electrical Equipments from Japan to Developing Asia: Issues, Policies and its Implication for Extended Producer Responsibility”. In *Extended Producer Responsibility Policy in East Asia - in Consideration of International Resource Circulation –*, 157-165. Hayama. IGES.
- Hotta, Y. (2009), “Research Needs for 3R Promotion - Case of Asia Resource Circulation Policy Research Project and Its Activities” presented at *Inaugural Meeting of the Regional 3R Forum in Asia*, 11-12 November 2009, Tokyo, Japan.
- Aoki, C. (2009 a). 「中古家電の貿易と途上国における中古家電市場(II) -ベトナムとカンボジアの事例をもとに-」. In 『資源環境対策』 . Vol.45 No.11. 76-82.
- Aoki, C. (2009 b). 「中古家電の貿易と途上国における中古家電市場(I) -ベトナムとカンボジアの事例をもとに-」 In 『資源環境対策』 . Vol. 45 No.7. 63-67.
- Aoki, C., Hotta, Y., and Bengtsson, M. (2009), “Analysis on international policy trend of MFA (Material Flow Accounting/Analysis) - based on indicators for resource productivity and the possibility of international cooperation for developing countries - ”, presented at the *5th International Conference on Industrial Ecology “Transition Towards Sustainability”, 21-24 June 2009, Lisbon, Portugal*.

Hotta, Y., Hayashi, S., Aoki, C., and Bengtsson, M. (2009), "Extended Producer Responsibility (EPR) Policy in East Asia in consideration of International Resource Circulation". Presented at the *5th International Conference on Industrial Ecology "Transition Towards Sustainability"*, 21-24 June 2009, Lisbon, Portugal.

*2008 (selected)*

Bengtsson, M., Aoki, C., and Hotta, Y. (2008), "Capacity for Material Flow Accounting (MFA) in Selected Non-OECD Countries", *IGES WMR Working Paper Series*, Hayama. IGES.

Hotta, Y. and Kojima, S. (2008), "Estimation of Environmental Impacts of Regional Economic Integration in East Asia: Implications for Waste and Recycling Policy". *IGES WMR Working Paper Series*, Hayama. IGES.

Hotta, Y. and Elder, M. (2008), "Strategic options for sound material cycle society in Asia". *OECD-UNEP Conference on Resource Efficiency*, 23-25 April 2008. Paris.

*2007 (selected)*

Asian Development Bank and IGES. (2008), *Toward Resource-Efficient Economies in Asia and the Pacific*. Manila. ADB, IGES.

Hotta, Y., Elder, M., Mori, H., and Tanaka, M. (2008), "Policy Considerations for Establishing an Environmentally-Sound Regional Material Flow in East Asia" *The Journal of Environment & Development*, 26-50, March 2008.

IGES (2008), Chapter of Waste Sector in *Research on Innovative and Strategic Policy Options II (RISPO II) Promotion of Sustainable Development in the Context of Regional Economic Integration: Strategies for Environmental Sustainability and Poverty Reduction, Draft Final Report*, Hayama, IGES.

MOEJ and IGES (2008), *3R Issues paper- The 2<sup>nd</sup> Asia 3R Conference: March 18-19*, MOEJ Tokyo and IGES Hayama

Asian Development Bank and IGES. (2007), *Toward Resource-Efficient Economies in Asia and the Pacific: Highlights*. Manila. ADB, IGES.

### **3.5. Self-evaluation**

#### **(1) Relevance**

This research tried to respond the regionalisation or internationalisation of waste and recycling issues caused in large part by the steady advance of economic integration, especially increasing trade and investment flows resulting from trade and investment liberalisation. It identified the institutional mechanisms needed to establish a regional framework for efficient use of resources. This component intellectually contributed the conceptualisation of a new facility for international cooperation on the 3Rs: the Regional 3R Forum in Asia in collaboration with ADB, UNCRD and MOEJ, launched in November 2009.

#### **(2) Effectiveness**

Through involvement in the 3R Initiative, the Regional 3R Forum in Asia, and the ERIA 3R Working Group, this component effectively positioned IGES as one of the centres for policy research on sustainable resource circulation in Asia.

### ***(3) Efficiency***

By strategically linking WMR's research focus and the proposals for commissioned surveys, this component efficiently utilised the opportunities of commissioned works and generated both policy-relevant reports, as well as more research-oriented works.

### ***(4) Output and Impact Created***

This component contributed to the preparation and the agreement on the Kobe 3R Action Plan, which was agreed upon at the G8 Environmental Ministers Meeting in Kobe, May 2008. Also, based on the findings of this component, WMR argued the necessity of launching a regional coordinating forum for international cooperation on the 3Rs and contributed to the planning of the Regional 3R Forum in Asia, which was launched in November 2009.

By contributing to discussion materials of inter-governmental meetings, including those of the 3R Initiative, G8 Environmental Ministers Meeting in Kobe, and Regional 3R Forum in Asia, this component successfully positioned international resource circulation as a significant policy issue to be discussed in Asia and tried to propose some policy options on problems of WEEE, such as illegal trade and inappropriate recycling in Asia.

Also, this component successfully secured two multi-year research funds for international collaborative research to analyse policies for sustainable resource circulation from FY 2009 to FY 2011, namely the "Asia Resource Circulation Research Promotion Project" and the "Policy Research on Environmental Economics" in collaboration with the EA team. Both of these international collaborative research projects are expected to contribute to the newly established Regional 3R Forum in Asia.

## ***3.6. Conclusions***

From this component, it was concluded that there is a need for further research to, 1) analyse resource circulation (especially downstream) from an economic perspective, 2) to evaluate environmental and economic effects of domestic 3R and waste management policies in Asia, and 3) to analyse the effects of international policy cooperation in sound material cycle and 3R policy in Asia. Also, in relation to the component 2 above, it is now the time to analyse the gaps between 3R policies and strategies set forth by Asian countries and challenges associated with policy implementation.

Under the Regional 3R Forum in Asia which was launched in November 2009, a proposal was written to launch an international collaborative project for strategic research on sustainable resource circulation in Asia, and funding was successfully secured. This research aims to make policy proposals by examining strategies and policy tools to establish sound material cycle societies and economies in Asia. IGES acts as a coordinator of this international collaborative research among China, Thailand, Malaysia, and the Philippines. This project, together with Policy Research on Environmental Economics, will be a key research component of the SCP group for the next phase.

## 4. Upstream Policy Development for Resource Efficiency

This component deals with policy measures targeting upstream stages of the life cycles of products. This includes, for example, information systems aimed at helping stakeholders at different stages of products' life-cycles to ensure environmentally sound materials management. In relation to this objective, this component contributed to international policy processes by carrying out commissioned work for the MOEJ, such as the SAICM (Strategic Approach to International Chemicals Management), the Tripartite Policy Dialogue on chemical management, and international discussions on chemicals used in consumer products.

This component secured a three-year research grant<sup>1</sup> to analyse how a regionally harmonised system for improved information sharing on product contents between producers and recyclers of electrical and electronic products could contribute to increased safety and efficiency of recycling materials. The outcome of the research project, in conjunction with involvement in several chemicals-related international policy processes, led to international recognition of IGES expertise in chemicals in products.

### 4.1. Objectives

- to identify the major impacts on global supply chains of electric appliances in the Asia-Pacific region caused by introduction of chemical product policies such as REACH and RoHS in the EU;
- to analyse the mechanism for a regionally-harmonised improved product information system, especially information related to chemicals used in products and information needed for safe and efficient recycling;
- to identify and provide useful inputs to international policy processes related to chemical management, in order to facilitate regional collaboration in the Asia-Pacific on chemical management policy.

### 4.2. Major Findings

Aimed at ensuring environmentally sound materials management with a focus on the end-of-life stage, this component analysed the potential need for information on product contents among relevant stakeholders, and proposed related policy measures. Research generated the following findings and recommendations:

- 1) The informative responsibility of producers should be assigned under the EPR policy: Producers need to be responsible for providing information on their product contents to relevant stakeholders as discussed in the context of Extended Producer Responsibility (EPR) policy. For products with complex compositions, such as WEEE, the sharing of information on product contents among producers and relevant stakeholders, such as recyclers and waste treatment companies, is crucial for promoting safe and efficient recycling.
- 2) Taking preventive measures is important for recycling of WEEE: An extensive literature survey on the environmental and human health risks associated with recycling and treatment of WEEE in both developed and developing countries confirms that some sample tests show the severe impacts on human health and the environment due to inappropriate recycling. However, there is a lack of scientific data to evaluate the whole impacts of recycling activities.

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<sup>1</sup> Grant-in-aid scientific research fund for the waste management research from the Ministry of the Environment, Japan

- 3) The existing information systems are categorised into regulatory approach for the EU and voluntary approach for the US: Existing schemes in the EU and the US of managing product contents, with a specific focus on information on hazardous and valuable materials used in products, are categorised into two different approaches: regulatory approach for the EU and voluntary approach for the US. For promoting cooperation on information sharing schemes in the north-east Asia region, it is important to consider whether to further promote a voluntary approach or standardising schemes harmonised with EU standards.
- 4) Increased recognition by recyclers of human health and environmental risks is required: A series of interview surveys of recyclers for WEEE in Japan identified a low level of recognition of the environmental and human health risks associated with recycling, and thus the demand for sharing information on product contents with producers is relatively low. In order to promote information sharing schemes, the demand for information sharing from recyclers is indispensable.
- 5) Lack of policy measures in the market for hazardous recyclables: Focusing on the concept of information asymmetry, it was analysed how several policy measures reduce the information asymmetry between producers and recyclers. This study identified the current lack of policy measures, especially for recyclables treated in the market as valuable that contain hazardous substances. In the recycling market, the end-of-life composite products, such as WEEE, are often treated based on the market value of materials without proper consideration of potential hazardousness. This often leads to environmental pollution and serious health impacts in some developing Asian countries. In this sense, policy measures on information sharing mechanisms should be especially needed for valuable recyclables that contain hazardous substances.
- 6) Introducing an interface organisation would be essential in developing countries: Considering the situation in developing countries, the model of introducing an interface organisation between informal collectors and formal refineries was discussed. The introduction of an interface organisation could contribute to reducing the asymmetric information on product contents between informal recyclers and formal refineries and increase the efficiency of collecting recyclables.

Based on the outcomes of the research project, this component will continue focusing on regionally-harmonised policy measures for improved availability of information on product contents in order to promote environmentally sound materials management in the Asia-Pacific region.

#### ***4.3. Impacts Created: Inputs into Major Policy Processes***

Under this component, IGES made inputs to the SAICM international policy process. IGES participated in SAICM-related conferences, such as the first and second SAICM Asia-Pacific Regional meetings, SAICM OELTWG meeting, and the ICCM2 meeting, to follow up the discussion and support the delegation from the Japanese government. For the purpose of raising recognition of SAICM activities in Japan, IGES organised several public seminars with MOEJ. Moreover, IGES contributed by coordinating MOEJ-funded QSP (Quick Start Programmes) under SAICM. Through this commissioned work, this component has been developing knowledge on chemical-related policy issues and contributing to international discussions on chemicals in products through SAICM-related workshops.

This component conducted surveys on the need for an information sharing mechanism on chemicals used in products in relation to commissioned work for the Tripartite Policy Dialogue on

chemical management in FY 2007. In FY 2008, based on the outcome of the preliminary survey, this component applied for and successfully received the grant-in-aid scientific research fund for waste management research from MOEJ, and started a three-year research project on potential benefits of improved availability of information on product contents, and approaches to improved information exchange between producers and recyclers of electronics, aimed at increasing efficiency and safety of recycling. The first year's research reviewed existing information schemes pertaining to chemicals used in products, and identified the need for policy intervention for establishing an improved information management mechanism which can reflect the potential hazardousness of recyclables. By presenting research outcomes at the "Informal Workshop on Stakeholders' Information Needs on Chemicals in Articles/Products", IGES showed its expertise in this field, and as a result, one of the WMR members was nominated as regional representative of the Asia-Pacific on the steering group of the "Chemicals in Products" project implemented by UNEP as one of the SAICM emerging issues.

#### **4.4. List of Publications**

2009

- Mori, H., Koyanagi, H., Ogihara, A., Hotta, Y., Yu, J., Ori, A., Bengtsson, M., Hayashi, S., Chika, A., Totoki, Y., and Tsydenova, O. 2009. "Tekisei-na kokusai-shigen-nyunkan wo mezasita seihin-chu no yuuyou busitsu oyobi yuugai busitsu no kanri no arikata ni kansuru kenkyu (Research on management of valuables and hazardous materials in products aiming for environmentally sound international resource circulation) (K2016) (written in Japanese)" Hayama. IGES.
- Oyuna, T. and Bengtsson, M.. 2009. *Environmental and Human Health Risks Associated with the End-Of-Life Treatment of Electrical and Electronic Equipment*. IGES Technical Report. Hayama, Japan. IGES.
- Oyuna, T. and Bengtsson, M. 2009. Environmental and Human Health Risks Associated with the End-Of-Life Treatment of Electrical and Electronic Equipment. *Journal of Waste Management*. (accepted, under revision)
- Hayashi, S., Hotta, Y., and Mori, H. 2009, "The Emerging Need for Sharing Environmental Product Information and Reconsidering the Producer's Informative Responsibility" in Hotta et. al. (eds.) 2009, *Extended Producer Responsibility Policy in East Asia-in Consideration of International Resource Circulation*. Hayama, Japan: IGES.
- Williams, E., Bengtsson, M., Hayashi, S., Hotta, Y., Kahhat, R., and Totoki, Y. 2009. The Interface Organisation as a Tool to Redirect Scrap Circuit Boards from Informal to Formal Recycling. *Journal of Environmental Management*. (under review)
- Bengtsson, M. 2009. "Enhanced information sharing on hazardous substances in electronics: Connecting the production and end-of-life stages". In proceedings of *Informal Workshop on Stakeholders' Information Needs on Chemicals in Articles/Products*, 9-12 February 2009 in Geneva, Switzerland: UNEP and Sweden.
- Hotta, Y., Mori, H., Yu, J., Ori, A., Bengtsson, M., S. Aoki, C., Hayashi, S., and Totoki, Y. 2009. "Recycling Information Sharing System (RISS): Towards safe and efficient recycling of electronic products through improved products information management", presented at the *International Conference on Industrial Ecology "Transition Towards Sustainability"*, 21-24 June 2009, Lisbon, Portugal.
- Bengtsson, M., Hayashi, S., Hotta, Y., Totoki, Y., and Mori, H. 2009. "Towards an information exchange system on substances in electrical and electronic equipment for safe and efficient end-of-life treatment". In Proceedings of the 4<sup>th</sup> International Conference on Life Cycle Management, 6-9 September 2009, Cape Town, South Africa.

- Hotta, Y., Mori, H., Yu, J., Ori, A., Bengtsson, M., S. Aoki, C., Hayashi, S., and Totoki, Y. 2009. "Recycling Information Sharing System (RISS): Towards safe and efficient recycling of electronic products through improved products information management", poster presented at the *Inaugural Meeting of Regional 3R Forum in Asia*, 11-12 Nov. 2009, Tokyo.
- Hiraishi, T. 2010. "Overview of Approaches and Lessons from Japanese-hosted International Workshop on Chemicals Management", presented at the APEC Good Regulatory Practice; Case Study Workshop on the Chemicals Sector-From Principles to Practice, 1-2 March 2010, Hiroshima, Japan.

#### *2008 (selected)*

- Bengtsson, M. and Hayashi, S. 2008. "Improved Information on substances in electrical and electronic equipment (EEE) for safe and efficient recycling: Exploring a regional system for information exchange between the production and recycling stages of EEE", presented at the *14th Annual International Sustainable Development Research Conference*, 21-23 September 2008, New Delhi, India.

#### *2007 (selected)*

- Ogihara, A. 2007. Possibility Product Information Sharing Mechanism through Life-cycle, based upon collaboration between supply and recycle chain". *Second International Workshop on Chemicals Management in People's Republic of China, the Republic of Korea, and Japan*, 7-8 November 2007, Japan.

### **4.5. Self-evaluation**

#### **(1) Relevance**

Considering the increasing trade of manufactured products, demand for rare metals due to increasing attention to environmental technological innovation, and increasing resource demand in general in Asia, safe and efficient use of secondary materials, including rare metals, has gotten increased attention from policy-makers and industrial sectors. Towards this end, there is a rising need for harmonising chemical and resource management policy. This component aims to find niche for IGES and to provide policy-relevant research responding to this need by focusing on information sharing on substances in products from upstream to downstream.

#### **(2) Effectiveness**

This component has secured a three-year research grant to analyse how a regionally harmonised system for improved information sharing on product contents of electrical and electronic products affects improved safety and efficiency of recycling. In conjunction with involvement in several chemical-related international policy processes, this component successfully increased the international recognition of IGES expertise in chemicals in products.

#### **(3) Efficiency**

This component utilised the commissioned work for MOEJ as a channel for policy process and policy-relevant information gathering. At the same time, the research grant-related work contributed to generate a niche for IGES expertise in chemicals in products, an area which links the issues of

secondary resource management and chemicals management. Through mutual reference to commissioned work and scientific-research work, this component efficiently utilised its budget and opportunities secured by the project.

#### ***(4) Output and Impact Created***

Through continuous commissioned work for the MOEJ, such as involvement in international policy processes like SAICM and the Tripartite Policy Dialogue on chemical management, this component was successfully involved in policy development on international chemicals management, and IGES became one of the key players in sound chemical management policy in the Asia-Pacific region.

Also, through research on information sharing on product contents for efficient and sound recycling, this component successfully positioned IGES as one of the expert organisations in chemicals in products in the Asia-Pacific region. For example, one of the researchers is now representing the Asia-Pacific region in an expert working group on Chemicals in Products under the SAICM process.

#### ***4.6. Conclusions***

From this component, it was concluded that further studies on regionally-harmonised policy measures for improved availability of information on product contents is needed in order to promote environmentally sound materials management in the Asia-Pacific region. This outcome will be shared through contribution to the UNEP chemicals project under SAICM activities.

# Business and the Environment Project

## 1. Proactive Policies and Business Strategies for Strengthening Corporate Environmental Management (CEM) in Developing Asia

### 1.1 Objective

The overall goal of this project is to examine the strengths and deficiencies of current corporate environmental management (CEM) practices in three developing Asian countries (China, India and Thailand), and to suggest proactive policies that can further strengthen CEM efforts. The specific objectives of the research tasks in the 4<sup>th</sup> phase include: a) To outline the current status of innovative policy tools that concern CEM in the target countries; b) To demonstrate and select pathways that could be implemented as strategies for improving environmental performances of companies; c) To summarise the advantages of those strategies, outline the major challenges and design enabling policy frameworks responsive to business demands; and, d) To motivate key decision-makers by establishing appropriate dialogues and creating a platform to share information on good practices and policy experiences.

### 1.2 Major Activities

#### 1) Overall Research Framework and Components

The overall framework and research components are indicated in the figure of next page. The study work started with a thorough overview of CEM policies in the target countries. The analysis of determinant factors of proactive CEM was a necessary step to scope out effective policies. Corporate Environmental Information Disclosure (EID) and Green Supply Chain Management (GSCM) were fixed as two major research components. Various activities with clear research questions and appropriate methodologies have been conducted to observe these two strategies from different perspectives. Regarding the EID component, the driving factors of voluntary EID of listed companies were analysed by using accessible web data. Corporate environmental performance ranking and disclosure programmes were explored in-depth as a typical mandatory disclosure policy. Individual consumers and neighboring communities to companies were surveyed to monitor their reactions to available environmental information. In a similar manner, a series of research activities were carried out for the GSCM component.

Due to the natural difficulties in data collection for empirical policy research and some arrangement problems, the research tasks defined in the figure below were fully finished in the case of China, whereas field work in the other two countries partially failed. Nevertheless, considerable outputs were achieved.

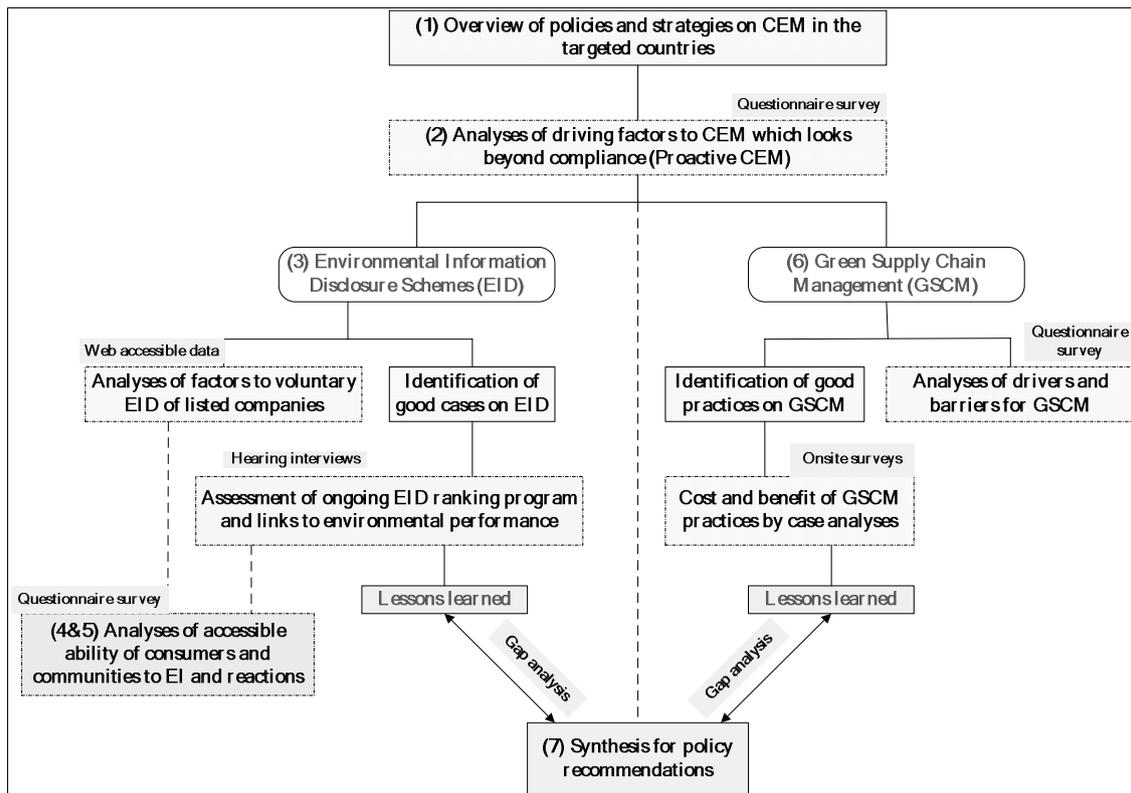


Figure: Overall framework and research components of the project

## 2) Major Findings

- (1) The preliminary overview showed that a series of policies have been adopted in the three target countries to assist in CEM. The Chinese government recently started to emphasise supportive measures to enhance interactions between firms and related stakeholders. Information related tools have encouraged citizen partnerships in promoting CEM. Corporate proactive initiatives in Thailand are mainly related to Environmental Management System (EMS), Green Labeling, Cleaner Production (CP), and so on. These voluntary initiatives are taken only by large and multinational companies. Considerable differences in CEM amongst various sectors were observed in India. While some sectors are significantly proactive and even incorporate CEM as part of business strategies, most are unconcerned. Industries facing legal problems are more proactive, and those which have been integrated into global supply chains appear more proactive in CEM.
- (2) An empirical survey in China confirmed the significantly positive effect of external pressure from competitors on proactive CEM practices. This indicates a higher sensitivity of Chinese companies to market factors. The roles of the general public and industrial associations are weak, showing the marginal power of selected normative pressures. The firms, which view environmental issues as opportunities and have higher learning capacities, are more likely to adopt proactive environmental activities. The main driving factors for Thai companies to adopt CEM practices are internal company policy and market demand, but not the fear of government regulation. Main barriers include limited technical and financial capacities and lack of cooperation from stakeholders in SMEs. In India, linkage with global markets and legal risk appeared to be influencing the CEM level of companies.

- (3) The statistical analysis of Chinese listed companies confirmed a marginal level of voluntary corporate EID. Their EID strategies are oriented to satisfy the government's concerns. Sampled companies selectively released their environmental information. An onsite hearing with the managers of companies participating in a government-oriented rating and disclosure programme in China showed that the companies with the worse rating records are more likely to improve their environmental performances. The mandatory disclosure programme does encourage firms to be more reflexive to their internal environmental problems. The deterrent and enhancement functions of the programme are weak due to marginal pressures from the classified stakeholders, such as investors, business partners and creditors. The influence of the public, such as neighboring communities and environmental NGOs, is weak too. In India, a similar environmental performance rating programme, the Green Rating Programme (GRP), is known to effectively pressure companies. GRP was able to significantly reduce the pollution load from the worst polluters.
- (4) The data gathered from urban residents in China were used to explore their green purchasing (GP) behaviors. People's involvement in GP activities is currently marginal. Nearly half of the respondents have seldom bought green products in the past. People are more likely to choose high energy-efficient appliances and organic foods. Environmental attitudes, especially the perception of self-responsibility for a better environment, greatly influence the intention toward GP practices. The availability of information on green products largely determines people's actual GP efforts.
- (5) An additional study discussed the environmental activism (EA) of residents living close to polluting companies in China. The communities are reluctant to act against their neighboring polluters. The EA efforts, which require the residents to directly communicate with the governments or polluters, achieve very low participation. The residents have an obvious tendency to act collectively against the polluters.
- (6) The study exploring GSCM activities of companies of China indicates that the firms are at a preliminary stage in GSCM practices. A firm's overall level of GSCM practices is significantly and positively associated with external pressures from regulatory, domestic clients and competitors. In Thailand, GSCM activities are scarce and mainly practiced by multinational companies. Existing GSCM practices have resulted in tangible environmental and financial benefits to participating companies regardless of whether they are suppliers or buyers on the supply chain.
- (7) In summary, a more comprehensive policy framework is highly necessary to facilitate CEM in Asian developing countries. Corporate EID may greatly facilitate communication between firms and other social actors. Effective measures should be taken to enhance the involvement and reactions of firms related to stakeholders in order to generate real pressures or incentives for improving CEM. Good GSCM practices should be disseminated to assist in environmentally sustainable business through the strategic and long-term cooperation of supply chain members.

### ***1.3 Impacts Created: Inputs into Major Policy Processes***

The series of field surveys and in-depth analyses on corporate EID strategy in China provided useful policy implications for modifying and expanding the current EID programme. The publications of research outputs in international journals encouraged academic discussions and further studies in

similar policy fields. The kick-off workshop in Kobe, Japan, and several roundtable meetings in India enhanced the communication of researchers, companies and policy-makers. The cooperative activities with local experts enhanced the research networking of IGES in the Asian region.

#### **1.4 List of Publications**

##### **Research Reports:**

- Research Report of the 4<sup>th</sup> Phase Business and Environment (BE) Project on Corporate Environmental Management in Asia: Outcomes of the Research Activities in the First Half of FY2007, KRC/IGES.
- Corporate Environmental Management: Policy Initiatives and Business Responses, Research Report of FY2007, KRC/IGES.
- Corporate Environmental Management in Thailand, Unpublished research report for FY 2008, KRC/IGES.
- Corporate Environmental Management: A study of Indian Industry, Unpublished research report for FY 2008, KRC/IGES.

##### **Journal Articles:**

- Liu X., Anbumozhi, V., 2009. Determinant factors of corporate environmental information disclosure: an empirical study of Chinese listed companies. *Journal of Cleaner Production* 17, 593-600.
- Liu et al., 2010. Functions analyses of mandatory corporate environmental disclosure: an empirical study in China. *Journal of Cleaner Production* 18, 823-832.
- Liu et al., An empirical study on the driving mechanism of proactive corporate environmental management in China, in press, *Journal of Environmental Management*.
- Liu et al., Environmental activism of firm's neighboring residents: an empirical study in China, in press, *Journal of Cleaner Production*.
- Liu et al., Determinant factors of green supply chain management: a survey study in the Yangtze Delta of China, under review, *International Journal of Production Economics*.
- Liu et al., An empirical study of green purchasing behaviors of urban residents by the reasoned action theory in China, under review, *Sustainable Development*.

##### **Conference Papers:**

- Liu X., Fujitsuka T., Shishime T., Green firm's profile via green supply chain environmental management: observations from Asian countries, the 9<sup>th</sup> International Conference on ECOMATERIALS, Kyoto, Japan, 23-26 Nov. 2009.
- Liu X., Wang C., Shishime T., Environmental activism of firm's neighboring residents in China, Environmental Governance Conference, University of Duisburg, Muhlheim, Germany, 18-20 May 2010.
- Shiga Y., Liu X., Shishime T., Rabhi A., Ogisu K., Fujitsuka T., 2010. Preliminary survey on environmental information disclosure in India, The 18th Global Environment Symposium, Japan Society of Global Environment, Chino, Japan, 27-28 August 2010 (under review).
- Rabhi A., Shishime T., 2010. Assessment of corporate environmental information disclosure in Thailand, The 32nd Symposium of the Association of Environmental & Sanitary Engineering Research, Kyoto, Japan, 30-31 July 2010.

## **1.5 Self-evaluation**

### **(1) Relevance**

This project targets the environmental management of companies at the micro-level as the research field of KRC focuses on the linkage between business and the environment. The project design at an earlier stage was based on a clear understanding of CEM policies in developing Asia. Since the effectiveness of command and control tools is limited by weak enforcement capacity and relatively high cost, and due to the fact that economic instruments are not popular in Asian countries, the project scope focused on corporate EID and GSCM, which can be classified as 3<sup>rd</sup> group CEM strategies, as the main contents for research. The overall question is to clarify how to translate the power held by the firm's stakeholders into pressures or incentives for enhancing CEM. Corporate EID acts as a bridge for communication between companies and their stakeholders, and also as a base for effective implementation of other CEM policies. GSCM is supposed to be effective due to the close business relationship between actors along the supply chain. All the research activities, as explained earlier, are policy oriented and provide convincing evidence for the development of new policy or modification and dissemination of ongoing policies. In this sense, the project has strong relevance with CEM policies and strategies for Asia and the Pacific region.

### **(2) Effectiveness**

The effectiveness of target CEM policies was confirmed. Due to the different situation of different target countries, the research tasks were arranged flexibly in response to the actual stage of the policy. For example, retrospective assessment of the mandatory environmental performance rating and disclosure programme of China showed its great effectiveness in regards to companies who were originally the worst performing. The case analysis of typical GSCM indicated that joint efforts along the supply chain obviously improved environmental performance as a whole. Another important aspect of this project is that it observed the direction of CEM policies and will assist related countries in developing an integrated and effective policy framework for the business sector.

### **(3) Efficiency**

The project was conducted very efficiently, in particular for the studies in China. By using a limited budget, the planned research tasks were finished on schedule within a short period. The clear definition of the research questions and good preparation of research documents by KRC at an early stage, such as an analytical framework and survey list, ensured the smooth implementation of various empirical studies jointly with local experts.

### **(4) Outputs and Impact Created**

Fruitful outputs and certain impacts have been generated. Reports summarising research activities and results were prepared annually. It is encouraging that several papers have been accepted and published in world top-class journals. These publications will raise policy discussions in related fields. As explained earlier, joint research and outreach activities strengthened the networking of IGES in Asia. Some research output has been linked to specific policy implementation processes. As an example, the information disclosure programme evaluation in China aided its better expansion. The three eastern provinces (Jiangsu, Zhejiang and Shanghai) of China have agreed to

implement this programme together by using identical rating criteria and sharing the rating results for improving CEM. One more meaningful message is that India would like to learn from the experience of the Chinese GreenWatch programme and try to practice EID strategy for promoting CEM.

## **1.6 Conclusion**

This project was conducted in an efficient way. All the pre-designed research tasks were finished, and the primary objectives were achieved over a short term. Due to the difficulty of requesting cooperation from the survey companies, the studies in Thailand and India provided less information, which greatly limited the potential for comparative analyses and definition of certain common issues from the three countries. Furthermore, our research emphasised more traditional environmental pollution problems and mainly utilised managerial performances as indicators. Energy efficiency and carbon emissions should be added to gain a more comprehensive observation of environmental performance of companies even in developing countries. Nevertheless, this project can be regarded as a successful case of policy research for this region.

## **2. Local Business Initiative (LBI)**

### **2.1 Objectives**

Although there has been a call for a dramatic decrease in greenhouse gas emissions toward construction of a low-carbon society, domestic greenhouse gas emissions are on the increase.

Following COP3 in Kyoto in 1997, many public education campaigns have been targeted at households. However, increases in CO<sub>2</sub> emissions have been striking in the household sector, and such efforts have unfortunately not resulted in CO<sub>2</sub> reduction. Measures that “go one step further” are necessary.

The Eco-Home Diagnosis project, that involves individual consultation, aims to effect real reductions of CO<sub>2</sub> in the household sector.

### **2.2 Major Findings**

Households are not necessarily aware of their main emitting point of CO<sub>2</sub>, such as car use, hot water supply and air heating. Misunderstanding of main emission areas and existence of “assumed eco action”, namely actions that are taken by household members but not necessarily effective for real reduction of CO<sub>2</sub>, were observed in the pilot study.

For the average household, it is not easy to comprehend where CO<sub>2</sub> emissions are coming from and how much is being emitted. In the pilot project, it was found that 75 percent of all households agreed that, “there was an area of large CO<sub>2</sub> emissions (“blind spot” area) of which we were not previously aware”. The pilot project also revealed that 40 percent of households were engaged in misdirected efforts in an area differing from the main emissions areas (assumed eco-action).

One of the characteristics of the Eco-Home Diagnosis method is “visualisation” of the reality of CO<sub>2</sub> emissions in the home. This method was confirmed to be effective in helping households to overcome “assumed eco”.

It is observed that certain percentages of households lapse into the state of “assumed eco”, where awareness and actual efforts do not deliver sound CO<sub>2</sub> reduction. For those who are stuck in “assumed eco”, the Eco-home Diagnosis may be a powerful approach to realise actual CO<sub>2</sub> reductions.

### **2.3 Impacts Created: Inputs into Major Policy Processes**

- (1) The Eco-home Diagnosis programme has been officially adopted by some local governments, such as Hyogo Prefecture, as a policy measure for CO<sub>2</sub> reduction in the household sector.
- (2) The Eco-home Diagnosis programme has been adopted as one of the main activities of centre for climate change actions of a major governmental body on climate action for citizens (that has 47 local branches).
- (3) In addition to the above, several local governments, NPOs, and private companies have express deep interest and the possible launch of the Eco-home Diagnosis programme.
- (4) The foundation for the “environmental concierge service” system is contained in the growth strategy of the Japanese government. Knowledge from the Eco-home Diagnosis is planned to be utilised for institution-building.
- (5) In the draft road map for achieving mid-term national GHG reduction targets (25 percent cut), the GHG home diagnosis scheme is regarded as one of the main measures in the household sector. Eco-home Diagnosis is planned to be a prototype scheme for GHG diagnosis.

### **2.4 List of Publications**

#### **Research reports:**

- Eco-Home Diagnosis, results from pilot study (May, 2009)
- Changing mobility attitudes through Eco-home Diagnosis (Jul, 2009)
- Eco-home Diagnosis, verification of and departure from “assumed eco-conscious actions” (Nov, 2009)
- Establishing Eco-home Diagnosis scheme through multi-stakeholder collaboration (Oct, 2009)
- Factor analysis on CO<sub>2</sub> reduction activities at the household; Empirical analysis through Eco-home Diagnosis project (under preparation)
- Establishment of the “Environmental Concierge System” is included in the “Growth Strategy” of the government of Japan. In building the system, the idea of the Eco-home Diagnosis programme may be used.

#### **Presentations:**

“New approach for reducing Household CO<sub>2</sub> emissions” presented at:

- Closed seminar held by the Environmental Committee of the House of Councilors (Apr, 2009)
- Symposium held by The Coalition of Local Governments for Environment Initiative (May, 2009)
- Seminar held by Kansai Global Environment Forum (Oct, 2009)
- International Symposium held by IGES-KRC (Nov, 2009), etc.

***Newspaper articles:***

- Asahi Newspaper (Mar, 2009)
- Asahi Newspaper (Dec, 2009)
- Kobe Newspaper (Nov, 2009)

***Broadcastings:***

- NHK "Seikatsu Hot Morning" (June 2009)
- NHK-Kobe "Evening News" (Dec 2009)
- NHK-BS (Jan 2010)

***Other outputs:***

- Software for Eco-home Diagnosis Ver.1 (2008) & Ver.2 (2009)
- Website of Eco-home Diagnosis (under preparation)

**2.5 Self-evaluation**

***(1) Relevance***

Research on Eco-home Diagnosis put the focus on climate change issues and the household sector, where regardless of country or region, GHGs have been increasing significantly. In this sense, research has been conducted on an appropriate area. However, due to various constraints such as time and human resources, research mainly dealt with Japan. The applicability of Eco-home Diagnosis has not been fully examined.

***(2) Effectiveness***

As described in item 4 (Impacts created: inputs into major policy processes) research has generated actual outcomes for society and is expected to actually contribute to some GHG reductions.

***(3) Efficiency***

The research was conducted with a small budget and limited human resources. Full utilisation of external funds and networking with appropriate stakeholders made highly efficient research and activities possible.

***(4) Outputs and Impact Created***

As described in item 4, this research generated actual impacts at both local and national levels.

**2.6 Conclusion**

The ideas of pragmatic solution schemes and detailed know-how for actual implementation, which is derived from IGES strategic research and related activities, have been significantly utilised by

local and national policy-makers. In that sense, although examination on the Asian context is insufficient, the research has accomplished its objective.

### **3. Eco-Industrial Clusters (EICs)**

#### **3.1 Objectives**

Clustering of small and medium-sized businesses in urban-rural fringe areas and development of inter-firm networks among them is a promising way to improve the environmental performance of small and medium-sized businesses that can also bring economic benefits to the community. The conservation of resources, and economic and social benefits of establishing EICs were evaluated, and promising measures were examined. Resource protection, economic development and social synergy effects were analysed, and measures to promote them were discussed based on the following evaluation and investigation.

- a) Evaluating the environmental, economic and social benefits of EICs in selected countries for research.
- b) Field visits to consult with stakeholders, local businesses, policy-makers and communities.

#### **3.2 Major Findings**

In consultation and cooperation with partner institutions, the project evaluated the environmental, economic, and social benefits of EICs in Indonesia, China and Sri Lanka. The case of each country was listed up, and SWOP analysis was administered. Roundtable meetings with local businesses, policy-makers and community groups in Indonesia and Sri Lanka were held.

A policy brief was produced which summarised the benefits and issues of formation and policy options regarding EIC based on information on Japan, India, Viet Nam and Thailand, as recorded in the IGES database.

#### **3.3 Impacts Created: Inputs into Major Policy Processes**

Results on effectiveness, challenges towards formulation, and policy options have been finalised based on information from Japan, India, Viet Nam, and Thailand in the IGES database, and a policy brief was published.

#### **3.4 List of Publications**

- V. Anbumozhi. Eco-industrial clusters: Enhancing regional economic development through environmental linkages Policy Brief #8 (2008).
- Nguyen Thi Van Ha, A. Prem Ananth, C. Visvanathan, V. Anbumozhi. Techno policy aspects and socio-economic impacts of eco-industrial networking in the fishery sector: experiences from An Giang Province, Viet Nam. *Journal of Cleaner Production*, 17(14): 1272-1280.
- V. Anbumozhi. *Eco-Industrial Clusters in Urban Rural Fringe Areas of Asia*, 2007.

### **3.5 Self-evaluation**

#### **(1) Relevance**

Developing countries in Asia are struggling to cope with the negative impacts of concentrated industrial activities. Inspired by the theory of industrial ecology, eco-towns or eco-industrial parks are frequently promoted in many localities as a strategy for reducing the environmental burden of industry in a way that is consistent with economic development. Yet the reach of those eco-approaches are limited to traditional manufacturing industries concentrated in urban areas. This research aims to promote appropriate corporate environmental management in the Asian region through Eco-industrial Clusters (EICs) research, which can be widely applied not only to manufacturing areas but also to rural areas.

#### **(2) Effectiveness**

EICs are defined as a community of businesses, a geographic concentration of interconnected companies in a specialised field that cooperate with each other and with the local community to efficiently share resources leading to improved environmental quality, economic gains, and equitable enhancement of human resources for both the businesses and local community. The fact files and stakeholder consultations made during the study revealed that the benefits of such eco-industrial strategies include efficient sharing of local resources, improved environmental quality and equitable distribution of socio-economic gains.

#### **(3) Efficiency**

Joint efforts that cut across three main policy streams of industrial policy, environmental policy and regional development policy enable us to achieve environmental policy objectives. EICs can provide business incentives more efficiently and allow for the enactment of countermeasures at a lower cost.

### **3.6 Conclusion**

As mentioned the above, the research outputs have been published as a policy brief and in world-renowned journals. "Eco-Industrial Clusters in Urban Rural Fringe Areas of Asia" is used as a reference for Asian countries, which is considered to introduce the EIC method.

## **4. Research partnership for the Application of Low Carbon Technology in India (ALCTI)**

### **4.1 Objectives**

This project aims at formulating an international scheme to accelerate the application of Japanese low carbon technologies in India. The scheme involves developing strategies, which include identification of appropriate technologies for greenhouse gas (GHG) reductions both in India and Japan, improvement of engineers' knowledge in demand side energy management, establishment of knowledge-sharing schemes, compilation of technical information on low carbon technologies, and construction of a joint working system with private firms.

In particular, our research combines several surveys on the electricity consumption of Indian energy-intensive manufacturing industries and urban infrastructure development, and also covers investment opportunities and success factors regarding the introduction of these technologies as well as barriers to introduction, through the selected pilot studies.

## **4.2 Major Findings**

Procedures are ongoing for the research to completely start from FY2010.

## **4.3 Self-evaluation**

### **(1) Relevance**

Research schemes regarding joint research with TERI in India and cooperation between public and private sectors is evaluated, however procedural steps have been the major activity in FY2009.

### **(2) Effectiveness**

Since full-scale research activities have not yet been implemented, the effectiveness of the research has to be evaluated once it starts.

### **(3) Efficiency**

Collaboration with the private sector, which has technology information, is a necessity for research activities. At present, some associate researchers have joined KRC from major corporations in the Kansai region. Under a limited budget, an efficient research system has been formulated.

### **(4) Outputs and Impact Created**

Since full-scale research activities have not yet been implemented, effectiveness of the research has to be evaluated once it starts.

## **4.4 Conclusion**

Since full-scale research activities have not yet been implemented, effectiveness of the research has to be evaluated once it starts.

## **5. Co-benefit Technology Platform (CTP)**

### **5.1 Objectives**

This project aims at surveying co-benefit technologies in Japan, which will contribute to solve not only environmental issues but also global warming issues in Asia. The “Co-benefit Technology Committee” (tentative name) will be set up with members who are specialists in Japan to list up and

evaluate co-benefit technologies. Furthermore, questionnaires to survey the needs for technologies in Asian countries will be implemented. The results of questionnaires will be fed back to the committee in evaluating the technologies.

## **5.2 Major Findings**

The committee was launched this year; hereafter a complete survey and analysis will be conducted.

## **5.3 Self-evaluation**

### **(1) Relevance**

Dissemination of the co-benefits project, which aims for compatibility between global warming countermeasures and environmental pollution control measures, is highly needed in regards to policies.

### **(2) Effectiveness**

Information on co-benefit technologies was gathered in a short time and the future direction has been indicated in the published report.

### **(3) Efficiency**

The research gathered comprehensive information regarding co-benefit technologies from Japan and abroad in the short implemented term, a three-month span, and clarified the problems.

### **(4) Outputs and Impact Created**

Since full-scale research activities have not yet been implemented, effectiveness of the research has to be evaluated once it starts.

## **5.4 Conclusion**

While the dissemination of the co-benefits project, which aims for compatibility between global warming countermeasures and environmental pollution control measures, is highly needed in regards to policies, information on co-benefits technologies was gathered and the future direction has been indicated in the published report.

## **6. Analyses of CO<sub>2</sub> emissions embodied in Japan-China trade**

### **6.1 Objectives**

The objectives of the research are to: (a) quantify the volume of CO<sub>2</sub> emissions affiliated with the trade of commodities between Japan and China, and determine whether one country is a net

importer of CO<sub>2</sub> emissions from another; (b) identify whether bilateral trade reduces or increases carbon emissions in total; (c) analyse whether a comparative advantage in trade between the two countries is associated with more or less carbon-intensive sectors; and (d) analyse policy options for reducing total CO<sub>2</sub> emissions from trade between the two countries.

## **6.2 Major Findings**

The time series of quantifications indicate that CO<sub>2</sub> emissions embodied in exported goods from Japan to China increased overall from 1990 to 2000. The exported CO<sub>2</sub> emissions from China to Japan greatly increased in the first half of the 1990's but decreased in the second half. Regardless, there was a net export of CO<sub>2</sub> emissions from China to Japan during 1990-2000. The (scenario) comparison shows that bilateral trade has helped the reduction of CO<sub>2</sub> emissions. On average, the Chinese economy was confirmed to be much more carbon-intensive than Japan. The analysis shows a significant but not perfect correlation between the carbon intensities at the sector level of the two countries. Most sectors of Chinese industry could benefit from learning Japanese technologies that produce lower carbon intensities.

## **6.3 Impact Created: Inputs into Major Policy Processes**

This study added one more layer to the discussion of post-Kyoto regimes for the climate change issue by considering the implications of international trade. The quantitative estimations fill up the gap that existed for related research on Asian countries. As the first IGES Strategic Fund project, this study may provide a model for the implementation of following similar research.

## **6.4 List of Publications**

- Liu X., Wang C., 2009. Quantitative analysis of CO<sub>2</sub> embodiment in international trade: An overview of the emerging literatures. *Frontier of Environmental Science and Engineering in China* 3(1), 12-19.
- Liu X., et al., 2010. Analyses of CO<sub>2</sub> emissions embodied in Japan-China trade. *Energy Policy* 38(3), 1510-1518.
- Zhou X., Liu X., Kojima S. (eds.), Carbon emissions embodied in international trade: An assessment from the Asian perspective, Published report of IGES, March, 2010.

## **6.5 Self-evaluation**

### **(1) Relevance**

This study has strong relevance to climate change policy by addressing the effects of international trade.

### **(2) Effectiveness**

The quantitative analysis would assist not only in discussions on the responsibility principle of carbon emissions, either production-based or consumption-based, but also help in seeking opportunities for mitigating emissions as a whole by using environmentally comparative advantages in trade.

### ***(3) Efficiency***

The study was conducted smoothly and efficiently by arranging experts from both countries together.

### ***(4) Outputs and Impact Created***

The output was also fruitful. The main outcome was published in the well-known journal, "Energy Policy", which may lead to further studies on similar topics.

## **6.6 Conclusion**

The project was conducted well and various outcomes have been generated. The quantification so far shows some interesting findings, but it is only the first step in discussions on actual policies. Further research shall be continued to design and test policy options, especially economic approaches, for adding environmental concerns to the international trade flow.

## **7. Study on measures to drastically diffuse a low-carbon household system by introducing the "Green Gift" scheme: towards the realisation of multiple dividends on Japan's Green New Deal**

### ***7.1 Objectives***

Japan's Green New Deal aims to 1) create an economic boost and jobs and 2) build a low carbon society. Thus highly effective priority policies are desirable to head in the direction of these objectives. The priority policies of Japan's Green New Deal are supporting dissemination of low carbon equipment, such as solar energy generation and high-efficiency water heaters and aiming for the formulation of a low carbon society through the Green Gift scheme.

### ***7.2 Major Findings***

Research results have not yet been finalised since the research is ongoing.

However the following results are expected:

- (1) The older generation has relatively abundant property (average of approximately 25 million JPY) and has sufficient capacity to bear the initial cost (about three million JPY) of purchasing low carbon equipments.
- (2) The domestic (Japanese) potential market is estimated. It ranges from 400 to 600 million households. This potential market size implies the potential for significant diffusion of low carbon equipment when the scheme is successfully implemented.
- (3) Effective and Win-Win networks of related stakeholders, such as government, PR consultants, low-carbon equipment manufacturers, and research institutes, are necessary for realising the scheme.
- (4) For some Asian countries, where inter-generational ties are much stronger than Japan, the scheme can be applied.

### **7.3 Impact Created: Inputs into Major Policy Processes**

Since the research was only launched in October 2009, no actual input has been made so far. However, the idea of the Green Gift won an award in the “2009 Environmental Policy Competition for NGO/NPO/Business” of MOEJ, as one of the best proposals. Actual policy inputs to MOEJ and other related stakeholders are scheduled.

### **7.4 List of Publications**

A policy brief (or policy paper) is now under preparation.

### **7.5 Self-evaluation**

#### **(1) Relevance**

The project has strong relevance for policy since it aims to consider and suggest effective measures to implement Japan’s Green New Deal.

#### **(2) Effectiveness**

This research is still in the initial stages, thus effectiveness of the research cannot be judged.

#### **(3) Efficiency**

The research started only six months ago. However, initial research, including literature reviews and interviews with appropriate experts, has been completed. A draft policy proposal has been developed and is now under the external review process. (Application for the competition was a part of the external review and evaluation of the policy idea.) By the nature of the Strategic Fund, this research is forced to be “very efficient”.

#### **(4) Outputs and Impact Created**

As of the end of FY2009, due to the procedural trouble with the SF, the research has not yet been completed. However, as aforementioned, a policy proposal has been attracting significant attention due to the potential effectiveness of the idea. Significant outcomes from this policy proposal are expected.

### **7.6 Conclusion**

The draft policy proposal is appreciated by relevant stakeholders, including policy-makers. We would like to complete this research while seeking for actual outcomes.



# Capacity Development and Education Project

## Summary

The CDE Project conducted research activities on its three focused components within one specific scope, entitled Education for Sustainable Development (ESD): 1) Research on Policy Scheme on Environmental Education/ESD, 2) Capacity Development (CD) - Human Resource Development in Higher Education (HE) for ESD, and 3) ESD Programme Research.

*First*, critical reviews on educational policy in Northeast Asia (NEA) have been conducted to report on its status and also to identify efficient strategic mechanisms in actual implementations. The component of FY2007, entitled Access to Environmental Information, emerged into policy research on Environmental Education/ESD which was specifically focused in FY2008 to 2009. Because of a lack of existing ESD policy research evidence, the outputs received considerable interest from governmental agencies and organisations in Asia, along with international and UN organisations, such as UNEP and UNESCO (as shown in a research paper on *Education for Sustainable Practice in China* in 2009 and a policy dialogue report on *Education for Sustainable Development Policy and Implementation in China, Japan and Republic of Korea in 2008*). In particular, the scope in FY2009 was specifically narrowed down into Education for Sustainable Consumption (ESC) in NEA, which is one of the specific themes of ESD work led by UNESCO and UNEP. The outputs in FY2009, such as a policy report and a research paper on *ESC in NEA* to be published in March 2010, have already received acute attention from policy and decision-makers. They are also expected to provide practical recommendations to ESC experts due to an urgent demand for ESC world-wide, as shown in publications accepted by and submitted to the *Journal of Education for Sustainable Development*, and the 9<sup>th</sup> *Asia Pacific Roundtable for Sustainable Consumption and Production*.

*Second*, CD in HE has been conducted throughout the 4<sup>th</sup> Phase. This research component was originally planned as “stakeholder empowerment, partnership building and capacity development”, focusing on developing policy proposals for stakeholder empowerment in Japan. There are two significant contributions of this three-year research – 1) critical policy process involvement in environmental capacity development in higher education, which provided the ground work for actual “consortium” establishment, and 2) contributions to research fields by identifying effective ways to develop environmental human resources. A total of six reports were published in 2008 and 2009 – mainly Japanese government funded commission reports (e.g. *Commission Report on Preparation on the Establishment of Environmental Consortium for Leadership Development* – submitted to the Ministry of the Environment of Japan in 2008 and 2009, and *Commission Report of the Study of Environmental Leadership Training Programmes in the World* – submitted to the Cabinet Office of Japan in 2008). In addition, two journal articles focused on *Environmental Leaders and their Development Methods in Higher Education* and *Environmental Leaders Development in a Form of Multi-stakeholder Partnership* are expected to be published in the *Journal of Resources and Environment* and the *Collection of Papers of 38th Annual Meeting of Environmental Systems Research* by the end of FY2009, along with two other journal articles published in 2008 and 2009.

*Finally*, in-depth ESD research has been conducted in South East Asia (SEA) in FY2008-2009

based on foundational research undertaken in FY2007. By providing insights into critical factors for ESD programmes based on concrete examples, the outputs contributed to the critical understanding of how we can promote ESD programmes in SEA. This research also specifically targeted how ESD can address the issue of poverty in SEA and promote sustainable livelihood development, as shown in a research paper on *Education for Change: A Case Study on ESD in SEA* published in 2008 and the *Case Study of Community-based ESD and Efforts to Strengthen Sustainable Livelihood*, which is expected to be published in May 2010. In particular, outreach activities and organising regional policy dialogues on ESD in cooperation with ASEAN, UNEP and UNESCO have significantly contributed to the ASEAN EE Action Plan and the Decade for ESD in SEA by bringing up together government officers, experts and practitioners in ESD to improve upon policy implementation in the actual field, as indicated in two consultation meeting reports entitled, *ESD in SEA in 2008* and *ASEAN+3 Policy Dialogues on ESD in 2009*. As additional outputs particularly in FY2009, research results of this component on ESD in SEA were submitted to and accepted by the Journal of Education for Sustainable Development, the *UNESCO Decade of Education for Sustainable Development Updates* and the *International Sociological Association World Congress of Sociology*.

## **1. Political Scheme on EE and ESD**

Within the concept of EE and ESD, the research theme was developed from a general scope of “Assessment of Environmental Information” in FY2007 into a specific case study of “Education for Sustainable Practice” in FY2008 in order to explore policy implementation in the actual field. The research theme was finally further developed into “Education for Sustainable Consumption (ESC)” in FY2009, the final year of the 4<sup>th</sup> Phase, within the indigenous political contexts of Northeast Asia and in consideration of the significance of consumption’s impacts on climate change, energy consumption and rapid economic development and the advanced economies of this region.

### **1.1 Objectives**

- To review current policies and concrete empirical cases to establish the key elements of successful policies;
- To identify good practice mechanisms for policy at the national level through outlining strategies for effective implementation;
- To detail the types of policies, programmes and activities that governments can implement to provide effective education for sustainable consumption and to encourage environmentally responsible consumer citizenship.

### **1.2 Major Activities**

- **FY 2007:** Research activities in China; Hosted a Regional Workshop in Beijing in cooperation with CSES (Chinese Society of Environmental Science).
- **FY 2008:** Research activities in China; Hosted a Regional Workshop in Beijing in cooperation with the Chinese Ministry of Environmental Protection and UNESCO Beijing Office and in Bangkok in cooperation with UNEP; Contribution to the UN Bonn World Conference on ESD.
- **FY 2009:** Research activities in Japan, China, and Republic of Korea; Hosted a Regional Workshop in Beijing; Contributed a chapter to IGES White Paper; Participation in UNEP Global Survey on Sustainable Lifestyles; Networking cooperation with the Partnership for Education

and Research about Responsible Living (PERL); Compilation of Japanese case study for submission to CSD-18 meeting; Policy dialogues in Japan, China and Republic of Korea on network building for ESC; Consultation work for Korean Presidential Committee on Green Growth.

### **Main Findings**

- Identified “obstacles to EE and ESD policy implementation in the actual field” which are closely linked to difficulties people face in understanding environmental issues, including climate change, energy consumption and resource management; In particular, case studies performed in China in FY2008, in cooperation with local researchers and experts, provides valuable input for relevant fields because of the lack of research evidence and some practical difficulties in accessing indigenous data;
- Identified “unique geographical and cultural ESD and ESC policy contexts in Northeast Asia” which appeared to be one of the most significant contexts in efficient instructional strategies for formulating a national policy framework; For instance, a case study of ESC practice in China, Japan and the Republic of Korea in FY2009 demonstrated the significance of social and cultural contents of ESC policy when considering how ESC can be specifically and effectively applied at national and local levels;
- Identified “three priorities for advancing governmental support of ESC”; The first priority is the identification of clear mechanisms that can be implemented from the level of national policy to influence consumer behavior. The second priority is providing appropriate capacity building for policy decision-makers so they have the skills and understanding to implement effective ESC policy, and the third priority is to increase political dialogues on ESC to secure cooperation and good practice, especially across the NEA region; FY2009 research focused on the first priority in detail, and priorities two and three are to be explored further in the 5<sup>th</sup> Phase research;
- Identified “primary mechanisms for promoting sustainable consumption and a framework for assessment of ESC” based on development of a framework for understanding, planning and assessing ESC policy, outreach activities and organising regional policy dialogues on ESC in Northeast Asia.

### **1.3 Impacts Created**

CDE Project activities on the political scheme of EE and ESD have contributed to two major policy arenas: the *Decade of Education for Sustainable Development* (DESD for 2005-2014) and Education for Sustainable Consumption (ESC). First, DESD has been led by UNESCO, and its major concept is reforming understandings on education as a tool for advancing responsible citizenship for the achievement of sustainable development. Despite well-reformed and theorised concepts of ESD by international experts and academics, there is still a substantial gap in implementation of policy and practice. The other is the *Marrakech Process 10-Year Framework Programme*, which has been led by UNEP for sustainable consumption and production. The Marrakech Process identifies consumer practices as a primary factor of current unsustainable development and acknowledges ESC policy as one of the key roles in advancement of sustainable consumption. In particular, the Italian Task Force on ESC and the Swedish Task Force on Sustainable Lifestyles have highlighted the critical lack of policy research on ESC at the national level. Within the background above, distributed research outputs and outreach activities of Component one in the 4<sup>th</sup> Phase are highly significant and contributed to the decision-making processes of the following governments in Northeast Asia

and international and UN agencies:

- The Ministry of Environment for Environmental Education Promotion Law established in 2008 and Green Growth Education, which has been led by the Presidential Committee on Green Growth since 2009 in the Republic of Korea;
- Center for Environmental Education and Communication, the Ministry of Environmental Protection in China, which is a leading governmental agency for EE/ESD and ESC, especially through a national project entitled the “Green School Project”;
- Partnership for Education and Research about Responsible Living (PERL), which is a global initiative to put research evidence into the evaluation of the Marrakech Process in 2010; PERL has been sponsored by diverse international and UN agencies such as the EU, Consumer Citizenship Network, UNEP and UNESCO; In particular, the CDE Project has taken on the role of a cooperative institute on ESC policy research in Northeast Asia and is expected to submit a paper by this May to the UN Commission on Sustainable Development via PERL for the evaluation process of the Marrakech Process in 2010.

### **Inputs into Major Policy Processes**

- National level – Republic of Korea: provided consultation on Green Growth strategy and development of an Education for Green Growth programme; China: provided dissemination of Chinese good practices regarding the “Green School Project” and helped to strengthen implementation of ESC programmes; Japan: strengthened contribution to UNDESD and ESD implementation in country;
- Regional level – contributed to the initial network building between TEMM countries;
- International level – Provided input on Asia-Pacific contexts of both the UNDESD (to UNESCO, UNEP and at the Bonn Conference) and on ESC (to the Marrakech Process, UNESCAP, UN Commission on Sustainable Development, and PERL).

### **1.4 List of Publications**

- Choi, M. Y. (2008) *The Education for Sustainable Development Policy and Implementation in China, Japan and Republic of Korea*, Hayama: IGES [Workshop Proceedings].
- Takahashi, M. (2008) Research of the obstacles observed during environmental education policy in Sabah, Malaysia, *Paper on Environmental Information Science*, No. 22, 475-480, Tokyo, Japan, Center for Environmental Information Science [Research Paper – In Japanese].
- Choi, M. Y., Dahe, J., Guo, R., Li, F. and Cao, X. (2009) *Education for Sustainable Development Practice in China*. Hayama: IGES [Policy Report].
- Choi, M. Y., Tian, Q. and Didham, R.J. (2009) *Education for Sustainable Consumption in China, Japan and Republic of Korea*. Hayama: IGES [Workshop Proceedings].
- Choi, M. Y. and Didham, R. J. (2009) Learning for Sustainable Future – Centred on Action Plan and Its Implementation in the UK towards a Low-carbon Society: In Choi, S. J., Kim, L. S., Lee, J. H., Choi, M. Y. and Ra, M. Ra (Ed.) *A Comparative Study on Environmental Education between Countries toward Low-carbon, Green Growth*, pp9-10, Seoul: Ministry of Environment in Korea and Korea Environmental Education Association [Research Report- In Korean].
- Choi, M. Y. and Didham, R. J. (2010) *Education for Sustainable Consumption in Northeast Asia: Strategies to promote and advance sustainable consumption*. Hayama: IGES [Policy Report].
- Choi, M. Y. and Didham, R. J. (2010) Primary Mechanisms for Promoting Sustainable Consumption: How governments can initiate effective Education for Sustainable Consumption;

*IGES White Paper III*. Hayama: Institute for Global Environmental Strategies [IGES White Paper - Expected in June 2010].

- Didham, R. J. and Choi, M. Y. (2010) *Education for Sustainable Consumption: Effective Strategies to promote Responsible Consumer Behaviour*. [Conference Paper - Submitted to 9<sup>th</sup> Asia Pacific Roundtable of Sustainable Consumption and Production and expected in June 2010].

## **2. Capacity Development - Human Resource Development in Higher Education**

FY2007 – Assessment of Needs for MoEJ project “Environmental Leadership Initiatives for Asian Sustainability”

FY2008 – Guidelines for “University-led Environmental Leadership Initiatives”

FY2009 – Network work on “Multi-Stakeholder Consortium of Environmental Leadership Development”

This research component was originally planned as “stakeholder empowerment, partnership building and capacity development”, focusing on developing a policy proposal for stakeholder empowerment. Due to the active involvement in actual policy processes on environmental capacity development led by the Japanese government, this component’s research focus is on higher education and partnerships with other social stakeholders.

### **2.1 Objectives**

- To examine appropriate mechanisms for environmental human resource development in higher education;
- To review innovative higher education programmes for environmental human resource development through university curriculums.

### **2.2 Major Activities**

- **FY 2007:** Organised survey and consultations on needs for ESD leadership; assisted in formation of framework on Environmental Leadership Initiatives for Asian Sustainability (ELIAS) led by MoEJ;
- **FY 2008:** Coordinated work on Development for Higher Education Programmes and on Government-Industry-Academia partnerships under ELIAS framework;
- **FY 2009:** Developed and coordinated the Environmental Consortium for Leadership Development (EcoLeaD); served as secretariat of EcoLeaD Preparatory Congress.

## **Main Findings**

### **(i) Image of environmental human resources**

Targeting higher education, it was clarified that it is more appropriate to call environmental human resources “environmental leaders”, who can facilitate social shifts towards a sustainable society in Asia. An environmental leader is defined as a person who considers the importance and urgency of solving environmental problems based on his or her own experience and ethical thinking, has strong motivation to build a sustainable society and to realise integrated development in the environment,

society and economy through business and civil activities using his or her expertise, and takes on a leadership role in innovative social changes. The three prerequisites of environmental leaders are strong motivation, expertise and leadership.

### ***(ii) Method to develop environmental human resources***

Universities must play a leading role as a place to develop environmental leaders since universities are designed to develop student skills and capabilities required to play the roles of experts in the future, and to influence the direction of student careers after graduation. According to the preliminary study conducted, it was found that in current university programmes related to environmental leadership development, all universities developed curriculums to provide holistic knowledge on environment and sustainability issues. At the same time, it was clarified that the curriculum of each university varies according to the academic background of the school or department. From this result, it was understood that each university aims to develop environmental leaders of different expertise that can work in various fields of society. In the meantime, all universities applied nearly the same pedagogical practices, insisting on the development of practical skills by including report writing, presentations, group work, and so forth. Since practical skills are necessary for all leaders of different fields, and not specifically for environmental leaders, pedagogy related to human skills development are not significantly different for environmental leaders and other leaders. Therefore, in developing environmental leaders, it is assumed that one should select the field of expertise related to environmental issues, and proceed with themes on environmental issues when gaining practical skills and continue to develop them.

### ***(iii) Method to develop stakeholder partnerships in facilitating environmental capacity development in higher education***

Considering the various knowledge and human skills necessary for environmental leaders, it was assumed difficult to develop such elements in one university. A new method was suggested to integrate multi-stakeholder cooperation into university systems. In order to do so, a coordinating and networking organ is necessary. In responding to suggestions obtained through the surveys, the establishment of a consortium for developing environmental leaders is considered to be effective to build multi-stakeholder partnerships, provide interdisciplinary university curriculums, and create positions for trained environmental leaders. This proposed consortium should play several roles to develop partnerships among different stakeholders, which can mainly be divided into three main functions. They are a) coordination, b) system development, and c) information sharing on multi-stakeholder (business-government-university-civil society) cooperative education.

## ***2.3 Impacts Created***

The Japanese government has made development of environmental leaders a part of national prioritised policy to establish a sustainable Asia. This policy originated in Japanese government efforts to strengthen environmental capacity development through proposing the establishment of the “UN Decade on Education for Sustainable Development” in 2002 (launched in 2005). Among various initiatives, the Japanese government has put special focus on university education, in cooperation with various social stakeholders, to cultivate environmental leaders both within Japan and other countries in Asia and the Pacific.

Through involvement in policy process, IGES has served as a leading organisation for the preparation and implementation of the relevant policy process called “Environmental Leadership Initiatives for Asian Sustainability” led by the MoEJ. For the first part of the research phase, IGES took on the role of compiling the opinions of different social stakeholders to publish the “Vision for University-led Environmental Leadership Initiatives for Asian Sustainability”, initiated by MoEJ as a guideline for the development of environmental leaders. Then in the latter part of the research phase, IGES served as the organisation responsible for the establishment of the “multi-stakeholder consortium”, which was proposed as an effective forum to develop environmental leaders. IGES research output on relevant programmes in environmental leader development has been widely disseminated as a reference for university programme development and revision. IGES has contributed to develop basic ideas and concepts of environmental leaders, methods of their development, and disseminated these ideas to the academic society, as well as relevant communities in Asian countries. As a result, the term and concept of “environmental leaders” have increasingly appeared in various media. Besides publications, outputs of this study have been shared in academic societies and at international meetings of the relevant themes within Japan and Asia, for further reference for other countries to develop similar initiatives.

Note: The content of these research findings has partial reference to the “Vision for University-led Environmental Leadership Initiatives for Asian Sustainability” (MoEJ, 2008).

### ***Inputs into Major Policy Processes***

Contributed to formation of MoEJ led programmes: Environmental Leadership Initiatives for Asian Sustainability (ELIAS), Development of Higher Education Programmes for ESD, and Environmental Consortium for Leadership Development (EcoLead).

### ***2.4 List of Publications***

- Kobayashi, M., Takahashi, M. and Yoshizawa, M. (2008) *FY2007 Commission Report on Producing “Vision for Environmental Leadership Initiatives for Asian Sustainability in Higher Education”*, Tokyo: Ministry of Education of Japan [Report – In Japanese].
- Yoshinari, A. and Ota, E. (2009) *Commission Report of the Study of Environmental Leadership Training Programmes in the World, Commission Work of the Basic Research on the Science and Technology and others, Fiscal Year 2008*, Tokyo: Cabinet Office of Japan [Report – In Japanese].
- Yoshinari, A. and Ota, E. (2009) *Study of Environmental Leadership Training Programmes in the World Research Report (Commission Work of the Basic Research on the Science and Technology and others, Fiscal Year 2008)*, Tokyo: Cabinet office of Japan [Report – In Japanese].
- Ota, E. and Hayakawa, Y. (2009) *Study of Environmental Leadership Training Programmes in the World Research Report (Commission Work of the Basic Research on the Science and Technology and others, Fiscal Year 2008)*, Tokyo: Cabinet office of Japan [Report].
- Hayakawa, Y. and Ota, E. (2009) *FY 2009 Commission Report on Preparation on the Establishment of Environmental Consortium for Leadership Development*, Tokyo: Ministry of the Environment of Japan [Report – In Japanese].
- Takahashi, M. and Ota, E. (2009) *A Commentary on the Vision for Multi-Stakeholder Consortium for Education for Sustainable Development in Japan*, Hayama: IGES [Report].

- Takahashi, M. and Yoshizawa, M. (2008) Analysis of environmental human resource development activities by the universities, *Collection of Papers of 36th Annual Meeting of Environmental Systems Research*, 18-19 October 2008. p167-172. Committee on Environmental Systems Japan Society of Civil Engineers [Journal article - In Japanese].
- Ota, E., Hayakawa, Y., Yoshinari, A., Takahashi, M. and Morishita, K. (2009) Research on the role of Environmental Internship for Universities and Private Companies, *Annual Report of Japan Society of Environmental Education, Kanto Branch*, Japan Society of Environmental Education, Tokyo [Journal article - In Japanese].
- Ota, E., and Takahashi, M. (2010) Analysis on Images of Environmental Leaders and their Development Methods in Higher Education: Case Study on the Programmes of Graduate Schools, *Collection of Papers of 38th Annual Meeting of Environmental Systems Research*, Committee on Environmental Systems Japan Society of Civil Engineers [Journal article - In Japanese].
- Ota, E. and Morishita, K. (2010) Environmental Leaders Development in a Form of Multi-stakeholder Partnership: Current Activities of Environmental Consortium for Leadership Development, *Journal of Resources and Environment*, Environmental Communications [Journal article in Japanese - Expected in February, 2010].

### **3. Education for Sustainable Development - Centred on community-based programmes**

FY2008 - Assessment of policy and practice for ESD in Southeast Asia

FY2009 - Networking Focus: Facilitating ASEAN+3 Policy Dialogues on ESD; & Research Focus: ESD and communities-of-practice to strengthen Sustainable Livelihood models

Building civil capacity for community-based and participatory decision-making is one of the three key characteristics of the *Decade of Education for Sustainable Development* (DESD), which has been led by UNESCO. Nevertheless, the application of DESD has given more attention to the formal education sector than to the informal component of building communities of practice during the first half of the UNDESD (2005-2014). Meanwhile, a series of international meetings such as *The High Level Officers Informal Meeting for ASEAN+3 Environment Ministers Meeting* and the *ASEAN+3 Leadership Programme* identified the Climate Change Partnership and Regional Cooperation for Environmental Education for Sustainable Development (EESD) to achieve a low carbon society in Southeast Asia (SEA). In regards to poverty, livelihood security, resource consumption, environmental degradation, and climate change mitigation issues, SEA is a significant region as shown by statistical figures, such as a quarter of the population living with less than 1.25 USD a day, and having one of the fastest economic growth rates world-wide. Based on the above background, Component three research activities focused on community-based ESD programmes at the local level to strengthen sustainable livelihoods in SEA.

#### **3.1 Objectives**

- To broaden the scope for ESD by demonstrating an important interchange with work to build communities of practice and secure Sustainable Livelihoods;
- To identify projects and activities strengthening the work of and connection between ESD and local capacity development for Sustainable Livelihoods;

- To detail means for policy-makers, governments and NGOs to apply ESD methodology to a wider perspective, and in doing so secure sustainable livelihoods and enhance the local practice of sustainable development and climate mitigation;
- To develop a model of ESD programmes for Sustainable Livelihoods.

### 3.2 Major Activities

- **FY 2008:** Research activities in Thailand, Viet Nam and Singapore; Hosted a Regional Consultation Meeting in Bangkok; Participation in UNEP Tunza conference.
- **FY 2009:** Research activities in Thailand; Hosted a Policy Dialogue workshop in Bangkok; Participation in UNEP Tunza conference; Participation in UNEP-Tongji Environmental Leadership Programme; Participation in and reporting on ISAP 2009 meeting.

### Main Findings

- Identified that ESD is conceptualised in terms of EE within formal education and generally recognised in EE as *Environmental Education for Sustainable Development* (EE for SD) across ASEAN countries;
- Identified “cohesive structural framework of ESD programmes at the local level” consisting of *critical factors of community of practice* which encourage environmental action and empowerment in the daily lives of people, based on research on the gap between the political arena and actual implementation;
- Identified that ESD in SEA has high level recognition in policy and is gaining the attention of researchers and educators; however, ESD is still an ambiguous concept for many in policy and in practice;
- Identified a gap not only between people’s awareness towards climate change issues and their actual actions, but also between policy and practitioners across ASEAN countries;
- Identified that the non-formal educational sector is an important area for advancing ESD in SEA; Especially in light of the need to reduce poverty and strengthen livelihood securities, ESD should be addressed and modeled as a tool for community capacity development. By combining and synthesising methodologies of ESD, *communities of practice* and capacity development, it is possible to establish better inclusion and performance of sustainable development approaches at the local level. A new model of *Education for Sustainable Livelihoods* is presented as a tool for individual and community empowerment.

### 3.3 Impacts Created

Development of ESD both in policy and practice is in the early stages in SEA, which has mainly adopted the concept of EE for SD. CDE Project research activities on ESD programmes targeted at SEA country cases have been conducted in cooperation with two major governmental agencies. These are the Ministry of Environment and Ministry of Education and also international and UN agencies such as ASEAN, The Japan Foundation Southeast Asian Bureau, SEAMEO-RECSAM (Southeast Asian Ministers of Education Organisation-Regional Centre for Education in Science and Mathematics), UNESCO, UNEP and WWF. As results of Component three research activities in the 4<sup>th</sup> Phase, it was possible to contribute to ESD policy decision-making processes such as the ASEAN Environmental Education Action Plan 2008-2012 led by ASEAN, the preparatory process of the national ESD policy in Brunei Darussalam and the DESD in Asia and the Pacific led by UNESCO-Bangkok:

- By bringing together government officers, experts and practitioners in ESD to improve policy implementation in the actual field,
- By providing policy decision-makers insight into critical factors for ESD programmes based on concrete examples from research evidence, and outputs contributed to the critical understanding of how we can promote ESD in SEA,
- By providing specific recommendations targeting how ESD can address the issue of poverty in SEA and promote sustainable livelihood development, and
- By distributing research reports on ESD policy and implementation in ASEAN+3 countries in international publications and UN agencies as shown in the following cases.

### ***Inputs into Major Policy Processes***

- National level – Provided policy dialogues for improvements of ESD implementation in several ASEAN countries, especially Thailand, Viet Nam, and Brunei Darussalam;
- Regional level – Contributed to implementation of ASEAN Environmental Education Plan;
- International level – Contributed to UNESCO and UNEP discussion on new approaches to ESD, especially Education for Mitigation of and Adaptation to Climate Change; Post Disaster-Post Conflict (PDPC) Education; provided consultations to UNEP Youth Leadership development for environmental sustainability.

### ***3.4 List of Publications***

- Choi, M. Y. and Kipp, R. (2008) Regional Strategy Consultation Meeting on Education for Sustainable Development in South-East Asia. Hayama [IGES- Consultation Meeting Report].
- Choi, M. Y. and Kipp, R. (2009) Education for Change: A Case Study on Education for Sustainable Development in Southeast Asia, Hayama: IGES [Research Report].
- Choi, M. Y. and Didham, R. J. (2009) *ASEAN+3 Policy Dialogues on Education for Sustainable Development*. Hayama: IGES [Workshop Proceedings].
- Choi, M. Y. (2009) Intergovernmental Strategic Cooperation on Education for Sustainable Development to Achieve Education For All and Millennium Development Goals: In Korean National Commission for UNESCO (Ed.), *Current Status and Strategies of Official Development Assistance for Education, Science and Technology (III)*, pp33-61, Seoul: Korean National Commission for UNESCO [Research Paper – In Korean].
- Didham, R. J. and Choi, M. Y. (2010) *Case Study of Community-based Education for Sustainable Development and Efforts to Strengthen Sustainable Livelihoods*. Hayama: IGES [Research Report - Expected in May 2010].
- Choi, M. Y. and Didham, R.J. (2010) *Review of Current Policy on Education for Sustainable Development in ASEAN Countries*. Hayama: IGES [Policy Report - Expected in March 2010].
- Didham, R. J. and Choi, M. Y. (2010) “ASEAN+3 Policy Dialogues on Education for Sustainable Development”, *Decade of Education for Sustainable Development Update: Progress in Asia and the Pacific*, Bangkok: UNESCO [UNESCO Newsletter, February Edition in 2010].
- Hamanaka, H. and Didham, R. J. “International Forum for Sustainable Asia and the Pacific: Multi-Stakeholder Partnerships for Environmental Capacity Development towards Establishing Low-Carbon Society”; *Journal of Education for Sustainable Development*: 4:1 (2010). Didham, R. J. and Choi, M. Y. (2010) ASEAN+3 Policy Dialogues on Education for Sustainable Development, *Journal of Education for Sustainable Development* [Submitted in December, 2009].
- Didham, R. J. and Choi, M. Y. (2010) “Cultivating Sustainable Livelihoods through Education

and Capacity Building: Modelling Education for Sustainable Development to advance communities of practice” - Accepted for *XVII ISA World Congress of Sociology* [Conference Paper – Accepted for July 2010].

## **4. Self-Evaluation:**

### **1) *Relevance:***

The efforts of the CDE Project during the Fourth Phase of Research at IGES corresponded closely with trends in education for sustainable development occurring both in Asia and internationally. The objectives of the Decade for ESD (2005-14) and the priorities highlighted in the Japanese government’s *Action Plan for the UNDESD (2006)* provided a strong framework for considering the relevance and necessity of research options. The three components of research for the Fourth Phase were based on three identified areas for creating significant impact through ESD: 1) strategic policy and implementation, 2) higher education and leadership capacity development, and 3) civil society and public participation in sustainable development.

The project’s research strategy began from these three main themes, but in each case took steps to focus and specialise the component priorities. In component one, by moving from a general review of EE/ESD policy and implementation to a more narrow focus on Education for Sustainable Consumption, research was able to provide a higher level of added value and also a research specialty at the forefront of international policy trends, as highlighted by contributions to the upcoming Commission on Sustainable Development-18 meeting on SCP and cooperation with the European-based Partnership for Education and Research about Responsible Living (PERL). The research of component two became focused on MoEJ commission work in conjunction with the Environmental Leadership Initiatives for Asian Sustainability (ELIAS) and helped to advance the practice of ESD in higher education in Japan specifically, and in the Asia-Pacific more generally. Component three research priorities developed from a broad investigation of ESD policy and practice in ASEAN countries. The research in FY2008 highlighted two strong possibilities for providing added-value to ESD in SEA: 1) curriculum development and teacher training, and 2) informal education to establish communities-of-practice for sustainable development. As this second opportunity is one that has been under-investigated, efforts in FY2009 prioritised this topic and were able to correspond strongly with UNEP’s new priority of “Education for Climate Change Mitigation and Adaptation” and UNESCO’s new priority of “Education for Disaster Risk Reduction” and “Post Disaster, Post Conflict education”.

### **2) *Effectiveness:***

The time period of the Fourth Phase at IGES overlapped with the first half of the UNDESD, during which a transition in ESD from general conceptualisation and promotion towards strategic practice and implementation occurred. The effectiveness of CDE’s research has evolved in a corresponding manner to this transition. Early research efforts across all components consisted of broad reviews of ESD policy and practice. However, the corresponding publications were important as they were some of the first works to document efforts being made in ESD in Asia, while analyses were able to identify effective policy recommendations relevant to a wide audience. During the course of the Fourth Phase, research priorities became more focused and specialised, allowing for production of unique and innovative findings.

### **3) *Efficiency:***

The three components of the CDE Project required a research strategy that began with investigation of a general theme but narrowed to a more specific topic with added value during the course of the Fourth Phase. Each component was able to make this transition and produce strategic policy recommendations on innovative research topics over the three-year period. Component one research elaborated a very successful ESD policy study in NE Asia during the conceptualisation phase, which led to the identification of the very significant, value-added specialisation of ESC. However, the one challenge faced here was that the specialisation on ESC did not carry with it much previous knowledge and required a substantial general investigation on SCP in FY2009. Component two was able to establish its specialty very quickly because of the MoEJ commission work and provided structured findings to a ready audience. Component three was slow to identify a narrow research priority, but in FY2009 an innovative specialty was selected and significant findings presented a valuable new research path.

### **4) *Outputs and Impact Created:***

The CDE project produced a total of 12 reports, nine journal articles and conference papers, and contributed chapters to three further publications during the Fourth Phase. Additional benefit was gained by facilitating regional policy dialogues through the hosting of several workshops and experts consultations. The research findings and publications of CDE projects had direct impact on the formation of ESD policy in NE Asia, provided capacity development opportunities for policy-makers in SE Asia through knowledge dissemination, drew attention to the Asian experience in ESC in international policy negotiations, and aided in the advancement of sustainable development opportunities in higher education in Japan.

### **5. *Conclusion:***

Starting from a broad focus on education for sustainable development, the Capacity Development and Education Project matured into three very specialised and unique research components. IGES remained at the innovative forefront of ESD thought during the Fourth Phase, while at the same time diversifying into non-traditional aspects of education. The work on Education for Sustainable Consumption has brought recognition to IGES as a leading voice on ESC in the Asia-Pacific. The results of work on ESD leadership building in higher education are clearly identifiable in the established Environmental Consortium for Leadership Development (EcoLead). Finally, efforts on ESD policy in SE Asia advanced regional policy dialogues and furthered better implementation.

## **Chapter 3**

# **Programme Management Office (PMO) Activities**



# Programme Management Office

The research work and activities that have been spearheaded by the Programme Management Office (PMO) have been aimed at addressing cross-cutting policy issues, linking research and policy processes, and supporting and empowering multi-stakeholder and civil society organisations in the context of promoting effective environmental management and sustainable development.

## ***Main Activities are follows:***

- i) Asia-Pacific Forum for Environment and Development (APFED)
- ii) Asia-Europe Environment Forum (ENVforum) of the Asia Europe Foundation (ASEF)
- iii) Asian Environmental Compliance and Enforcement Network (AECEN)
- iv) Environment Congress for Asia and the Pacific (ECO ASIA)
- v) G8 Environment Ministers Meeting Preparation Project
- vi) Indonesia Climate Change Programme Loan (ICCPL) Monitoring and Advisory Activities
- vii) International Research Network for Low Carbon Societies (LCS-RNet)

## **1. Asia Pacific Forum for Environment and Development (APFED)**

### ***1.1 Objectives:***

The Asia-Pacific Forum for Environment and Development (APFED) aims to address critical issues facing Asia and the Pacific region and to propose new models for equitable and sustainable development. The second phase of APFED activities (APFED II) is intended to promote the implementation of policies, measures and actions recommended in the 2004 APFED Final Report. APFED II activities consist of three major components: Policy Dialogues, the Knowledge Initiative, and the Showcase Programme. IGES coordinates and supports APFED activities as the APFED Secretariat in collaboration with APFED members and other partners.

### ***1.2 Major Findings:***

The APFED II Fifth Plenary Meeting was held at the Kagaya Hotel in Nanao, Ishikawa, Japan from 31 July to 3 August 2009. It was attended by 60 participants including APFED committee members, special advisors, NetRes representatives, 2009 APFED Award winners, observers, and staff members of sponsoring and co-organising partners.

The International Workshop "Innovation in policy and field actions for ecosystem management and biodiversity conservation" was held at the Headquarters of the Institute for Global Environmental Strategies (IGES) in Hayama, Kanagawa, Japan on 26 June 2009, as a part of the programme for the International Forum for Sustainable Asia and the Pacific (ISAP). The APFED II Fifth NetRes Meeting was held in Suva, Fiji from 16 to 20 November 2009. The APFED II Final Report Drafting Group Meeting/Policy Dialogue was held from 21 to 24 February 2010 in Bali, Indonesia in conjunction with the UNEP Governing Council / Global Ministerial Environment Forum. The revised version of the APFED II Final Report was submitted to the Ministry of the Environment, Japan (MOEJ)

in March 2010, and at the same time, the findings and recommendations have been further synthesised and disseminated through various outreach measures including organisation of a public seminar.

### ***1.3 Impacts Created: Inputs into Major Policy Processes:***

The APFED II Fifth Plenary Meeting developed an argument on the progress of APFED activities, future plans and the process of substantiating and finalising the APFED II Final Report that will be launched in 2010. The Workshop in June reviewed the progress made in implementing projects for promoting policy measures and field actions aimed at ecosystem management and biodiversity conservation, and discussed associated findings and recommendations. The APFED II Fifth NetRes Meeting addressed progress made under the key components of the APFED II five-year activities and research results undertaken since 2005. The Meeting drew key findings, lessons learned and recommendations and facilitated the completion of the APFED II Final Report that addresses key thematic areas including climate change, biodiversity and resource management, as well as cross-cutting issues such as governance, finance and capacity building. In 2009, ten projects were selected under the 2009 APFED Showcase Programme, and five international good practices and five domestic projects were given the 2009 Ryutaro Hashimoto APFED Award. In March 2010, the Energy Globe Award sponsored by the Energy Globe Foundation (based in Austria) was given to the forest conservation project in Papua New Guinea and the rice husk gasification project in Viet Nam that are both supported under the APFED Showcase Programme.

### ***1.4 List of Publications:***

- Revised Version of the APFED II Final Report (English/Japanese)
- Revised Version of the APFED II Final Report Executive Summary (English/Japanese)
- Project Profile on Climate Change (English/Japanese)
- Project Profile on Biodiversity Conservation (English/Japanese)
- Project Profile on the 3Rs (English/Japanese)
- APFED Message on Climate Change
- APFED Lessons and Findings on Biodiversity and Sustainable Development
- APFED Lessons and Findings on the 3Rs: Enhancing resource efficiency for a sustainable Asia
- APFED Newsletter (January, July, September 2009 issues)

### ***1.5 Self-evaluation***

#### ***(1) Relevance***

It has become increasingly important to review and analyse cross-cutting policies and activities for promoting sustainable development and environmental management in Asia and the Pacific. It is therefore considered as highly vital to employ creative and innovative approaches to tackle complex policy conundrums and to analyse the interface of macro-policy and field actions. APFED work is intended to conduct comprehensive policy analysis and extract policy recommendations. The APFED work is of great significance and relevant in the context of promoting the replication of good policies and practices across Asia and the Pacific aimed at sustainable development.

## **(2) Effectiveness**

A great deal of synergies have been created by carrying out policy dialogue, good practice case studies, pilot projects and strategic research in an integrated manner. The policy dialogues were held in conjunction with the priority policy processes to disseminate knowledge and information on good practices and lessons learned, thereby raising effectiveness in creating conditions conducive to replicating good practices and implementing recommended policies.

## **(3) Efficiency**

In order to carry out activities efficiently and ensure cost-effectiveness, various functional activities have been organised in an integrated manner through, for instance, organising the APFED Showcase Panel and the APFED Award ceremony along with the APFED Plenary. Operational efficiency was also raised through involving NetRes in promoting national and sub-regional activities.

## **(4) Outputs and Impacts Created**

APFED thematic booklets have been produced on five priority policy areas, namely climate change, the 3Rs, biodiversity, water resources and stakeholder empowerment. They contain findings and recommendations arising from APFED activities and have been distributed within priority policy processes. Case study information is uploaded on the APFED website, and the number of downloads from the APFED database exceeded 260,000 in FY2008, making a top record among the IGES operating databases, and it is envisaged that public access to the APFED database will continue to grow.

## **1.6 Conclusion**

APFED activities are being steered around the three programme pillars that mutually interact through operations. The activities are focused on priority policy issues and promoted with involvement of the regional network towards fostering policies and social capacity development aimed at sustainable development. As described in the APFED II Final Report, through APFED work, an APFED model was demonstrated for promoting sustainable development based on empirical lessons. It remains vital to promote policy analysis and disseminate further output arising from APFED activities.

## **2. Asia-Europe Environment Forum (ENVforum) of the Asia Europe Foundation (ASEF)**

- 7<sup>th</sup> Round Table “The Accounting of Nature: Biodiversity and Ecosystem Services in Asia and Europe”, 29-30 June, 2009, Hayama, Japan;
- The Asia-Europe Environment Forum (ENVforum) Side Event: REDD for Climate Change Mitigation and Biodiversity Conservation held on 22 October 2009 at the ASEAN Conference on Biodiversity (ACB2009) with the theme Biodiversity In Focus - 2010 and Beyond, held on 21-23 October 2009 in Singapore;
- An official side event of COP15/UNFCCC: Institutional set-up of REDD and the involvement of the private sector, 15 December 2009, Copenhagen, Denmark; and
- Asia-Europe Environment Forum Track II Series Outlook from Copenhagen - Next steps for

Asia and Europe Policy Dialogue, 17 December 2009, Brussels, Belgium.

## **2.1 Objectives:**

To promote multi-stakeholder policy dialogue with Asian and European experts and practitioners regarding sustainability policy issues.

## **2.2 Major Findings:**

### ***Biodiversity and ecosystem***

- Decoupling biodiversity loss and ecosystem degradation from economic growth is essential for the implementation of effective overall policies Asia and Europe;
- Mainstreaming of biodiversity and ecosystem management in policy processes should be achieved;
- Assessing and agreeing to appropriate policy frameworks and targets for the CBD/COP10 and beyond need to be put in place;
- Prompting behavioural and priority changes in people's perceptions and sense of values should be achieved;
- Promoting capacity-building, multi-stakeholder collaboration and partnerships should be mainstreamed.

### ***REDD***

- Elaborating technical issues for effective REDD ++ (carbon management in forestry and other non-forest ecosystems) mechanisms, such as monitoring, reporting and verifying of carbon accounting;
- Facilitating fund provisions, such as to develop incentives and market mechanisms;
- Establishing guidelines to safeguard an optimal balance over carbon, ecosystem and income benefits;
- Supporting pilot projects through schemes including the APFED Showcase Programme;
- Promoting regional and global multi-stakeholder policy dialogue, for instance, through ASEM - ENVforum.

## **2.3 Impacts Created : Inputs into Major Policy Processes:**

The ENVforum 7th Roundtable was opportune as increasing attention has been given to the issue of biodiversity and ecosystem services over the recent years, and there is a need for policy inputs from various stakeholder groups and geographical regions. As ENVforum operates under the umbrella of the Asia-Europe Meeting (ASEM), the roundtable meeting provided a unique and valuable platform for inter-regional multi-stakeholder policy dialogue on global sustainability issues with close linkage to priority policy and decision-making processes. Stakeholders from both Asia and Europe shared knowledge which would help in promoting good practices for effective biodiversity conservation and successful ecosystem services management.

The COP15 side event addressed policy issues related to a future REDD (Reducing Emissions from Deforestation and Forest Degradation) scheme and recommended measures and actions for facilitating the development of policy and institutional frameworks. This dialogue gave an overview

of some key questions for Asia and Europe currently discussed at the COP15 by covering the issue of REDD. The event raised awareness among decision-makers in Europe about the significance of partnerships between Asia and Europe in the area of climate change and sustainable development.

## **2.4 List of Publications:**

- ENVforum 7<sup>th</sup> Roundtable Report “The Accounting of Nature: Biodiversity and Ecosystem Services in Asia and Europe” (English)
- Report “REDD for Climate Change Mitigation and Biodiversity Conservation” (English)
- Report “Institutional set-up of REDD and the involvement of the private sector” (English)

## **2.5 Self-evaluation**

### **(1) Relevance**

In order to bolster policy measures for tackling global environmental challenges at the international level, it is vital to promote the exchange of information and knowledge between Asia and Europe, which constitute a major part of the global economy. In addition, it is increasingly important to promote regional cooperation in the area of the environment as Asia moves forward in terms of regional economic integration. It is useful for Asia to learn how Europe has been forging regional environmental cooperation in the context of promoting regional environmental cooperation in Asia.

### **(2) Effectiveness**

The strategic approach is to focus on priority issues in the areas of international policies and institutional frameworks for addressing global environmental issues where the involvement of Asia and Europe remain at stake. The focused policy areas include climate change, energy, forestry, REDD, and biodiversity. By focusing on priority issues, the ENVforum policy dialogues have been making positive contributions to supporting international consensus building.

### **(3) Efficiency**

Policy dialogues are organised in the form of medium-sized roundtables or small-sized workshops as supplement to the large-sized forums convened every a few years. With such an approach, the experts and practitioners from Asia and Europe are involved in policy dialogues in a cost-effective manner.

### **(4) Outputs and Impacts Created**

Major outputs are the reports of various meetings. It is worth noting that at the 7<sup>th</sup> Roundtable, a workshop on scenario-based environmental planning was convened consecutively, and a proposal for promoting Asia-Europe cooperation on this topic was developed. Discussions and partnership building have been advanced on the issues of developing proposals for capacity development with the involvement of experts and practitioners of Asia and Europe.

## **2.6 Conclusion**

Building upon the outcomes of policy dialogues between Asia and Europe, concrete activities have been organised to promote policy measures, activities and capacity development for achieving sustainable development. As a major research institute in Asia, IGES is expected to play a leading role in international cooperation processes for Asia-Europe in this area.

## **3. Asian Environmental Compliance and Enforcement Network (AECEN)**

### **3.1 Objectives:**

AECEN is a regional network of national and sub-national agencies from Asian countries committed to improving environmental compliance and enforcement in Asia. AECEN's mission is to promote improved compliance with environmental policies, laws and regulations through the exchange of innovative policies and practices.

#### **Network objectives are to:**

- (1) Promote the development and implementation of improved environmental policies, laws, regulations, and institutional arrangements;
- (2) Strengthen practitioner capacity through specialised training and skills development; and
- (3) Facilitate regional sharing of best practices and information on strengthening compliance and enforcement.

The AECEN Twinning Programme is one of the network's initiatives to facilitate Member-to-Member technical engagement in environmental compliance and enforcement.

### **3.2 Major Findings:**

#### ***AECEN Twinning Project on the Development of Soil Contamination Countermeasures in Thailand:***

With technical assistance from experts from the Institute for Global Environmental Strategies (IGES) of Japan, Thailand's Pollution Control Department (PCD) organised a series of consultation workshops and technical exchanges to support development of a new policy framework for soil contamination countermeasures. In meetings from 14 to 17 September 2009, PCD presented its draft policy and obtained further feedback from practitioners from Japan and Malaysia.

#### ***2009 AECEN Regional Forum, 12 to 14 October 2009:***

From 12 to 14 October 2009, the Asian Environmental Compliance and Enforcement Network (AECEN) held its 2009 Regional Forum in Singapore, hosted by the Singapore National Environment Agency (NEA). The theme and focus of the AECEN regional forum was Cleaner Asian Cities through Effective Environmental Compliance and Enforcement. In the meeting, development partners expressed positive support for AECEN activities, and provided information on relevant ongoing or planned initiatives that relate to AECEN priorities, especially for regional capacity building activities and twinning partnerships.

***China-Japan collaboration for promoting capacity development to implement policies and programs aimed at improving energy efficiency and reducing GHG emissions:***

This Twinning Project is intended to review policy and institutional issues related to energy efficiency improvement, energy conservation and GHG emission reductions, and to conduct group discussions on Japan's policy performance in improving energy efficiency and on measures aimed at promoting energy conservation and reducing GHGs emissions in China. The activities will also comprise case studies in Baoding and Shanghai to review a co-benefit approach to improve energy efficiency and reduce GHG emissions, and capacity development programs for experimentation at the local or sub-national level in China.

***3.3 Impacts Created : Inputs into Major Policy Processes:***

Following the AECEN Twinning Project on the Development of Soil Contamination Countermeasures, Thailand's PCD, in partnership with other line agencies, has adopted a new policy for addressing soil contamination, a major national environmental challenge. A second phase to this project is due to be undertaken during 2010.

At the 2009 AECEN Regional Forum, USAID indicated that its support for AECEN is planned through 2012, while ADB expressed an interest in expanded cooperation related to social and environmental safeguards. The World Bank is also proposing a development grant to support some activities of the network. The U.S. EPA will also continue collaboration by providing technical assistance in line with agency priorities. In addition, SENSE is now looking at opportunities to collaborate and has initially started with supporting the participation by Lao PDR and Cambodian representatives in the 2009 Forum.

***3.4 List of Publications:***

- Policy synthesis report on soil contamination countermeasures in major countries
- AECEN Twinning Project Report - Support to the development of national policies and institutional arrangements for preventing and rehabilitating soil contamination in Thailand
- Forum Summary - Asian Environmental Compliance and Enforcement Network 2009 AECEN Regional Forum, 12 to 14 October 2009

***3.5 Self-evaluation***

***(1) Relevance***

AECEN policy dialogues on environmental law compliance and enforcement are highly useful as they are intended to facilitate the exchange of good practices among practitioners and to help forge social capacity for environmental law compliance and enforcement in Asian countries, while at the same time fostering the development of integrated environmental policies and implementation modalities. In addition, AECEN's Twinning Programme aims to support cooperation between the two member countries in promoting activities to develop concrete environmental laws or to strengthen implementation capacity. The outcome of the projects supported under the Programme is considered to be an important part that constitutes the development of environmental legal systems in Asian countries.

## **(2) Effectiveness**

In AECEN activities, senior or managerial officials of the environmental ministries or agencies responsible for environmental law implementation are mainly targeted in order to facilitate pragmatic policy dialogues on issues related to actual environmental administration. By integrating bilateral cooperation in AECEN activities, AECEN members work more proactively towards strengthening environmental law systems and implementation modalities. As to the Twinning Programme, participating members have shown great enthusiasm in the activities and their country members have started expressing a great deal of interest. The reactions of member countries demonstrate the positive impacts of AECEN activities in facilitating the development of environmental laws and implementation capacity in Asia.

## **(3) Efficiency**

AECEN regional forums for policy dialogues are organised once a year in rotation of Asian member countries, where Executive Committee meetings are also held consecutively. The progress of the Twinning projects is also discussed in the policy dialogue, where not only the participating countries, but also other member countries, can join in discussion on the Twinning projects. The ceiling of the grant from AECEN is set at 25,000 USD in order to catalyse co-financing by the participating countries, including human resources and in-kind contributions. With such cooperative schemes supported by the AECEN Secretariat and member countries, the cost-effectiveness of AECEN activities has been enhanced.

## **(4) Outputs and Impacts Created**

A number of reports were produced for the AECEN annual forums that cover major policy issues and used as reference to improve environmental law implementation in Asian countries. With respect to the Twinning Programme, reports are produced on the implementation of concrete environmental laws, as well as the progress in developing environmental law systems and implementation capacity in light of carrying out AECEN activities close to the practice of actual environmental administration.

## **3.6 Conclusion**

As host of the AECEN Secretariat, IGES is expected to strengthen its functions to support international cooperation towards facilitating the effective implementation of environmental laws in Asia. It will become vital to secure the financial basis for sustaining the IGES function for supporting the AECEN operational and secretariat activities.

## **4. Environment Congress for Asia and the Pacific (ECO Asia)**

### **4.1 Objective:**

In 1991, the Ministry of the Environment formed a frank and informal meeting with ministers from the Asia-Pacific region and representatives from international institutions. The original purpose of this meeting was to discuss and prepare for the 1992 United Nations Conference on Environment and Development (UNCED), known as the Earth Summit. However, this led to the convening of the

first Environment Congress for Asia and the Pacific, now known as ECO Asia. The enhanced input of this congress towards the Asia-Pacific region was highly regarded by UNCED. The Congress has been held 16 times from 1991 to 2008.

#### **4.2 Major Findings:**

In 2007, the 15<sup>th</sup> Environment Congress for Asia and the Pacific (ECO Asia 2007) was convened in the city of Fukuoka, Fukuoka Prefecture, Japan. Seventeen national delegates from the Asia-Pacific region and representatives from 11 international organisations participated in this congress. The main theme was “Possible Actions to be Taken by Asia and the Pacific to Address Global Environmental Issues”, and the meeting focused on exchanging views and opinions from Asia-Pacific regional standpoints and on possible cooperation in addressing two major global environmental issues, waste and recycling management and climate change management. For the 16<sup>th</sup> Environment Congress for Asia and the Pacific (ECO Asia 2008), convened in city of Nagoya, Aichi Prefecture in 2008, the same countries as 2007 participated with 17 national delegates from the Asia-Pacific region and representatives from 16 international organisations. The main focus for this congress was “Conservation and Sustainable Use of Biodiversity”, and valuable discussions were made.

#### **4.3 Impacts Created : Inputs into Major Policy Processes:**

For every ECO Asia, IGES contributed to the success of the meetings through providing discussion papers that raised and summarised key discussion points regarding the aforementioned issues, further clarifying discussion points by debating with facilitators and lead-speakers of each session prior to the congress, and in supporting preparation of the Chair’s Summary of the meeting. In ECO Asia 2007, the Waste and Resources Project, Climate Policy Project, and Programme Management Office provided their expertise and support. Additionally, the Forest Conservation Project and Programme Management Office contributed to the success of ECO Asia 2008.

#### **4.4 List of Publications:**

Commissioned report submitted to the Ministry of the Environment, Japan “The 15<sup>th</sup> Environment Congress for Asia and the Pacific (ECO Asia 2007) Congress Report” (December 2007)

Commissioned report submitted to the Ministry of the Environment, Japan “The 16<sup>th</sup> Environment Congress for Asia and the Pacific (ECO Asia 2008) Congress Report” (December 2008)

#### **4.5 Self-evaluation**

##### **(1) Relevance**

Since the establishment of IGES in 1998, cooperation in international policy processes has continued to be an important element of IGES strategic research activities. Involvement in the Environment Ministers Meeting was marked as significant input towards policy processes.

## ***(2) Effectiveness***

IGES has contributed through 1) providing discussion papers that raised and summarised key discussion points, 2) clarifying discussion points by debating with facilitators and lead-speakers of each session prior to congress, 3) supporting preparation of the Chair's Summary of the meeting.

Based on these contributions, IGES was able to achieve its initial purpose by taking necessary actions and establishing common understanding and clarification dealing with issues in the Asia-Pacific Region.

## ***(3) Efficiency***

ECO Asia aimed for a frank and informal meeting with high level participants (ministers) from the Asia-Pacific region. It was difficult to achieve direct impact on discussions on local environmental policies due to the meeting structure. Additionally from the signing of the contract to the opening of the congress, the time frame to organise this event was extremely short (no more than 2 months), and due to this limitation, IGES was placed in a difficult situation to prepare for an active high-level dialogue. Investment of IGES human resources was appropriate, and IGES was able to gain valuable experience in ECO Asia. Also this experience was a good lesson in dealing with a variety of international environmental policy processes.

## ***(4) Outputs and Impacts Created***

Through involvement in ECO Asia, outcomes indicated that the contribution of IGES strategic research activities in the international community has reached a certain level of impact; however, differences appeared depending on the theme. For example in regards to "waste and recycling measures", including ECO Asia 2007 and related regional meetings, the same issues were shared in the Asian region. These were the need for domestic policies, the need for domestic measures, and the need for common understanding. This led to each participating government strengthening its measures and the establishment of the "Regional 3R Forum in Asia" in 2009.

## ***4.6 Conclusion***

For the 4<sup>th</sup> Phase Strategic Research Activities, the PMO placed emphasis on "Discussion on Cross Sectional Policy Issues" and "Link between Research and Policy Process" to facilitate operations, and these purposes were achieved.

# **5. G8 Environment Ministers Meeting Preparation Project (FY2007-FY2008)**

## ***5.1 Objectives:***

Since 1992, the G8 Environment Ministers Meeting is held for the Environment Ministers of G8 countries to exchange opinions on major environmental issues facing the international community prior to the G8 Summit. Prior to the Hokkaido Toyako Summit in July 2008, the G8 Environment Ministers Meeting convened in the city of Kobe in Hyogo Prefecture, Japan (24 to 26 May 2008). For the G8 Environment Ministers Meeting, IGES contributed papers for discussion summarising the

main points of each issue. IGES also supported the preparation of official discussion papers. Based on IGES strategic research, IGES was able to meaningfully contribute to policy process.

## **5.2 Major Findings:**

The main themes for discussion in the G8 Environment Ministers Meeting in 2008 were “Climate Change”, “Bio-Diversity”, and “the 3Rs”. For this G8 Environment Ministers Meeting, not only the Environment Ministers of G8 countries but also Environment Ministers of other main developing countries (i.e. China, India, Brazil, etc.) and representatives of relevant international organisations participated. This resulted in expansion of discussion not just within the usual developed countries, but beyond their boundaries.

## **5.3 Impacts Created: Inputs into Major Policy Processes:**

IGES gathered information, analysed it, and after several adjustments with the GOJ and each G8 government, IGES provided official discussion papers. At the same time, IGES supported the preparation of the Chair’s Summary. At the G8 Environment Ministers Meeting, the Climate Policy Project’s “Kobe Initiative”, “Kobe Call for Action for Biodiversity”, and “Kobe 3R Action Plan” were adopted, and IGES contributed to the preparation of documents for policy processes between governments. At the Kobe Initiative, establishment of the International Research Network for Low-Carbon Societies (LCS-RNet) was suggested, and from FY2009 IGES became host to the secretariat for LCS-RNet.

## **5.4 List of Publications:**

- IGES, 2008a. Commissioned Report on G8 Environmental Ministers’ Meeting related meeting documents preparation for FY2007 (commission work from Ministry of the Environment of Japan).
- IGES, 2008b. Commissioned Report on G8 Environmental Ministers’ Meeting related meeting documents preparation for FY2008 (commission work from Ministry of the Environment of Japan).

## **5.5 Self-evaluation**

### **(1) Relevance**

Since the establishment of IGES in 1998, cooperation in international policy processes has continued to be an important element of IGES strategic research activities. Involvement in the Environment Ministers Meeting was marked as significant input into policy processes. Especially as interest in the G8 (currently G20) process was highly profiled in the international community, involvement in this project was highly appropriate.

### **(2) Effectiveness**

IGES has 1) gathered information, analysed the main themes of “Climate Change”, “Bio-Diversity”, and “the 3Rs”, 2) made adjustments between the GOJ and each G8 government, 3) provided official

discussion papers, 4) prepared the Chair's Summary, and 5) contributed to the preparation of policy process documents between governments.

Through these tasks and involvement in an important policy process, IGES was able to achieve its purpose.

### ***(3) Efficiency***

Investment of IGES human resources was appropriate. IGES utilised its knowledge on "Climate Change" and "the 3Rs" to make substantial contributions to international environmental policy processes. Additionally, in the area of "Bio-Diversity", IGES has supported the work of the Japan Wildlife Research Center by indirectly contributing to Japan in the same field of research.

### ***(4) Outputs and Impacts Created***

Through involvement in the G8 process, the contribution of IGES strategic research activities towards the international community was shown to have a certain level of effectiveness through preparation and adaptation in Climate Change issues related to the "Kobe Initiative", the "Kobe Call for Action for Biodiversity", and the "Kobe 3R Action Plan".

As suggested in the Kobe Initiative, the "International Research Network for Low-Carbon Societies (LCS-RNet)" was established with the G8 countries. Japan, as the country that suggested the LCS-RNet, and Italy, as the host country of the G8, took leadership to establish the LCS-RNet in April 2009. It continues as of today. Additionally IGES made contributions to the Kobe 3R Action Plan, through suggestions made at the 3R Initiative of the G8 Sea Island Summit (2004). IGES also provided a generalisation of each G8 country's activities, and highly recommended 3R National Strategic Plans and 3R Knowledge Hubs in the Asia region in two or more countries, thereby facilitating policy on the 3Rs in G8 countries and regional Asian countries. These contributions led to the establishment of the "Regional 3R Forum in Asia" in 2009.

## ***5.6 Conclusion***

For the 4<sup>th</sup> Phase Strategic Research Activities, the PMO has placed emphasis on "Discussion on Cross Sectional Policy Issues" and "Link between Research and Policy Process" to facilitate operations, and these purposes were achieved.

## **6. Indonesia Climate Change Programme Loan (ICCPL) Monitoring and Advisory Activities**

### ***6.1 Objectives:***

The Indonesia Climate Change Programme Loan (ICCPL) was agreed upon between the Government of Indonesia (GOI) and GOJ in August 2008. ICCPL was designed to support a wide range of Indonesian efforts to deal with climate change issues through providing 300 million USD per year as general budget support. A set of policy targets and actions were summarised in the form of a

Policy Matrix, and achievements of targets and actions are monitored for the justification of disbursement for each tranche loan.

IGES, as the core organisation mobilising its experts to the ICCPL M&A operations, i) has monitored the progress of attaining targets and actions in the Policy Matrix; ii) has proposed policy recommendations on GOI's climate change policies; and iii) is going to propose recommendations on GOJ's future international cooperation addressing climate change issues.

## **6.2 Major Findings:**

### ***From Nov. 2008 to Jun. 2009: Monitoring and Advisory on CY2008 actions***

IGES prepared *monitoring reports* stating i) attainments of policy targets and actions in six sectors (LULUCF, Energy, Water Resources, Water Supply and Sanitation, Agriculture, and Cross-cutting Issues) as stated in the CY2008 Policy Matrix; and ii) CY2008 challenges / obstacles; and iii) adequacy and notes for ensuring attainments of CY2009 targets. The *monitoring reports* were utilised as materials in inter-governmental dialogues between GOI and GOJ.

### ***From Oct. 2009 to Aug. 2010: Monitoring and Advisory on CY2009 actions***

IGES continues monitoring and advisory activities on targets and actions of the CY2009 Policy Matrix. An additional two sectors (Disaster Management and Marine, Coral Fisheries) were included based on an agreement between GOI and GOJ.

This will be the last year of the first round (three years) of ICCPL. As mentioned above, IGES provides two additional services to GOJ/JICA, which are: i) contributing to GOJ's consideration on the Policy Matrix for the next round of ICCPL through proposing ideas on the future direction of GOI's climate policies; and ii) evaluating the impact of ICCPL and summarising this evaluation in the form of the *ODA Programme Evaluation Report*.

## **6.3 Impacts Created: Inputs into Major Policy Processes:**

IGES contributes to the further strengthening of GOI's climate change policies and GOJ's international cooperation in addressing climate issues through the activities below:

- i) Supporting policy dialogues to strengthen GOI's climate change policies by providing *Monitoring Reports*, policy recommendations, and provisional ideas for future cooperation frameworks; and
- ii) Contributing towards further improvement of GOJ's environmental cooperation policies that address climate change issues through producing the *Programme Evaluation Report* (to be prepared by August 2010).

## **6.4 List of Publications:**

- *Final Report: The Advisory and Monitoring Activity for the Climate Change Program Loan to the Republic of Indonesia*, June 2009
- *Progress Report on Indonesia Climate Change Program Loan (II) Advisory and Monitoring in Republic of Indonesia*, October 2009

- *Provisional Ideas for Indonesian Climate Change Policy Matrix 2010-2014*, January 2010

## **6.5 Self-evaluation**

### **(1) Relevance**

In general, the programme loan aims to improve the capacity of developing countries to cope with specific policy areas (climate change policies in the case of ICCPL), through a series of dialogues between the developing countries and development partners while providing loans. On the other hand, as a result of UNFCCC/COP15 in 2009, the Copenhagen Accord was issued highlighting the importance of preparing Nationally Appropriate Mitigation Actions (NAMA) and establishing the frameworks for Measurable, Reportable, and Verifiable (MRV) policy actions in Non-Annex I countries. These two frameworks are expected to contribute to further mobilisation of international financial resources into climate change policies.

The structure of ICCPL has two aspects. These are summarising climate change policies driven by GOI in the form of the Policy Matrix, and holding a series of dialogues between the GOI and development partners on progress, attainments, and effective measures. These aspects could be regarded as a pioneering effort towards an international cooperation mechanism related to NAMA and MRV. Taking such structure into account, IGES could increase experience as well as demonstrate the expertise necessary to contribute to international cooperation in climate change issues through active involvement in ICCPL.

### **(2) Effectiveness**

Attainment of policy targets and actions were evaluated for CY2008 and CY2009. The result of the policy targets and actions for CY2008 was reported and submitted as a *Final Report*. For CY 2009, the *Final Report* is to be prepared by August 2010. Through ICCPL M&A operations, IGES has proposed policy recommendations for GOI's climate change policies, and also addressed recommendations on GOJ's future international cooperation in climate change issues. IGES proposed policy recommendations to GOI on the occasions of ICCPL Steering Committee meetings (conducted 5 times), high-level policy meetings with GOI governors, Technical Task Force meetings, and Sectoral Dialogue meetings. IGES researchers exchanged information necessary to monitoring activities with Indonesian experts including government officers and researchers. On the other hand, IGES has contributed towards improvement in GOJ's environmental cooperation policies through proposing recommendations to JICA and the Ministry of Foreign Affairs of Japan (MOFA). Additionally, IGES will include recommendations in the *Programme Evaluation Report* to be prepared by August 2010.

### **(3) Efficiency**

IGES has had each project's research specialist be involved intensively in M&A operations. Through these operations, IGES was able to obtain external budget support, as well as an accumulation of knowledge and experience working with different stakeholders in Indonesia. On the other hand, operations require further improvement in some areas, such as construction in general M&A operations, and coordination with external bodies. As a general remark, considering the sensitive nature of international cooperation with the climate change policies of Non-Annex I countries, the ICCPL M&A operations can be evaluated as highly efficient.

#### **(4) Outputs and Impacts Created**

ICCPL has contributed to the mainstreaming of climate change policies in Indonesia. Through the advisory and monitoring activities, IGES contributed to an increased awareness of climate change policy in related ministries in Indonesia, to strengthening of cooperation between Indonesian ministries, and to facilitation of clarification of climate change related budget use by the Ministry of Finance of Indonesia. Furthermore IGES to an extent influenced the GOI's preparation of key documents during the period, such as *the Indonesia Climate Change Sectoral Road Map*, and *the Medium Term National Development Plan*. Additionally, through its active involvement in preparation of the ICCPL Policy Matrix for the Second Phase (2010-2012), IGES contributed to the inclusion of fundamental policy issues toward further mainstreaming of climate change policies and other essential issues, particularly in the forestry and energy sectors.

#### **6.6 Conclusion**

IGES was involved in the mainstreaming process of climate change policies in a Non-Annex I country, and was able to reach a certain level of success. Based on experience in ICCPL M&A operations, enhancement of research quality is expected, particularly in such areas as effective analysis of the program loan approach.

### **7. International Research Network for Low Carbon Societies (LCS-RNet)**

#### **7.1 Objectives:**

Background - At their 2008 meeting in Kobe, G8 Environment Ministers recognised the need for countries to make the transition to low-carbon societies (LCS) to achieve the goal to halve global GHG emissions by 2050. The meeting also recognised the need for each country to develop a clear vision of what a low-carbon society would look like and how the transition might be achieved. Given this, the G8 Environment Ministers in Kobe strongly supported the establishment of a research network to help with developing these visions and pathways.

In 2009, at various international occasions such as the L'Aquila Summit and the COP15, world leaders recognised: 1) scientific evidence on the need to keep global temperature rises below two degrees Celsius above pre-industrial levels; 2) the need for a more ambitious emissions reduction goals for developed countries of 80 percent or more by 2050; and 3) the need for mid-term goals which would result in global emissions peaking as soon as possible. More countries, both developed and developing, are now explicitly showing their willingness to contribute to the world effort by setting reduction targets. For the research community now, the task is to identify concrete and feasible measures that will allow us to achieve low-carbon societies. The spirit of the Copenhagen Agreement, the result of COP15, reflected this, and the objectives of the LCS-RNet are ever more important.

Objectives - The International Research Network for Low Carbon Societies (LCS-RNet) was established in 2009 on the initiative of the G8 Environment Ministers Meeting (G8EMM) to help countries with developing visions and pathways towards LCS. Major objectives are 1) to provide a platform for the research community to promote information exchange and research cooperation to enhance understanding of LCS and to improve the research capacity of each research institution, 2) to promote dialogues among stakeholders, such as policy-makers, industries, citizens and

researchers, for the timely delivery of research output on LCS, 3) to link LCS research and policy-making processes including G8 by providing research outputs and recommendations.

## **7.2 Major Activities:**

In FY2008, IGES PMO prepared the Strategic Paper of the LCS-RNet and informational material to promote the idea of the LCS-RNet, while working with participating countries and research institutions registered through their governments to develop the objectives and activity plan of the Network. Progress was reported at the Preparatory Meeting of the G8EMM held on 8 March 2009 in Rome, Italy.

The major objective of FY2009 was to create a firm base for the Network working with core research institutions. As of March 2010, 15 research institutions from seven countries have registered through their governments to the LCS-RNet. Through the activities introduced below, various researchers from wider research communities have already participated in the LCS-RNet.<sup>1</sup>

### ***Researchers Meeting (Trieste, Italy, 1-2 April 2009):***

Prior to the official launch of the network, a group of low-carbon society researchers met in Trieste. This meeting was held under the auspice of the Italian G8 Presidency through the Ministry for the Environment, Land and Sea. Participants at this meeting acknowledged the importance of collaboration in taking forward LCS research at the interface between science and technology, society and policy. Researchers also identified important research themes and approaches such as: scenario and modelling approaches; interdisciplinary perspectives on the transition to LCS; integration of environmental, energy, economic and social systems; dissemination of knowledge; and building awareness outside the scientific community.

### ***Inaugural Meeting (1<sup>st</sup> Annual Meeting) (Bologna, Italy, 12-13 October 2009, organised by the Euro-Mediterranean Centre for Climate Change (CMCC)):***

Following the official launch of the LCS-RNet, the planning of its first meeting was begun. The agenda of the Inaugural Meeting was developed by CMCC and an Interim Steering Group responsible for the scientific planning of the meeting with the support of the LCS-RNet Secretariat. A total of 55 participants from 17 countries and two international organisations participated in the meeting and discussed main LCS related areas of research: LCS and the policy context, green growth, pathways, technology innovation, and behaviour change.

Various options for the management and decision-making functions of the LCS-RNet were prepared by the LCS-RNet and discussed by the Interim Steering Group prior to the meeting, and were also discussed in the Bologna meeting. Through the course, the Interim Steering Group, that officially became the Steering Group per a the decision made by the Bologna meeting participants, took the lead to ensure the scientific quality of the output of the LCS-RNet, through a series of telephone conferences organised by the LCS-RNet Secretariat.

### ***Activities under the initiative of the LCS-RNet Secretariat***

In FY2009, the LCS-RNet Secretariat held two stakeholders dialogues. One was an international

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<sup>1</sup> Participant lists are available on the website of LCS-RNet at <http://lcs-rnet.org>.

expert workshop on the opportunity of the ISAP on 26 June 2009, and another was in Yokohama (15 March 2010) with local stakeholders whose backgrounds included finance, retail business, local government, NGOs, and so on. The LCS-RNet Secretariat also aims to promote research on LCS in Asia. In FY2009, a researcher from India was invited with an LCS-RNet fellowship and completed a study entitled “A Study on Developing LCS Targets and Pathways for Bhopal, India”. In February 2010, “Dialogue between Policy Makers and Researchers: Demands and roles of low carbon development/Green Growth research from a policy perspective” was held back to back with a workshop planned by the Climate Policy Project of IGES. The two-day workshop was co-organised by the Ministry of the Environment of Indonesia and IGES, and entitled, “Low-Carbon Development (LCD) in Indonesia and Asia: Dialogues between Policymakers and Scientists on Green Growth (GG)” (Bogor, 16-17 February 2010).

The Secretariat of the LCS-RNet compiled information on and analytical works produced through the above activities mainly regarding the current situation of LCS-related research and relevant policies in participating countries, as well as other various occasions such as meetings and visits of G8 countries and some countries in Asia, and published the annual report titled as LCS Research 2009.

### **7.3 Impacts Created: Inputs into Major Policy Processes:**

Discussion points of the Researchers Meeting in Trieste were summarised in the Chair’s summary, and forwarded to the G8EMM held in Siracusa in April 2009, where the Environment Ministers welcomed the launch of the LCS-RNet and requested it to report back on its outcomes periodically.

The main findings of the discussion points of the Inaugural Meeting in Bologna were synthesised as a report entitled, “Achieving a Low Carbon Society: Synthesis Report - Inaugural Meeting of the LCS-RNet”. The Report was presented at a Side Event of the UNFCCC AWG session at the Barcelona Climate Change Talks in November, as well as at the COP15 in December 2009.

As for dialogue between policy-makers and researchers in Indonesia, the main findings were summarised as the synthesis report that is under the participants review.

### **7.4 List of Publications:**

- Meeting Report: Researchers Meeting : International Research Network for Low Carbon Societies (April 2009)
- Synthesis Report “Achieving a Low Carbon Society: Synthesis Report - Inaugural Meeting of the LCS-RNet” (December 2009)
- Meeting Report: Stakeholder Dialogue on Low Carbon Societies – expert workshop in ISAP (January 2010)
- International Research Network for Low-Carbon Societies, Newsletter, Vol.1 (December 2009)
- Researchers combine efforts to realise LCS: LCS-RNet Bologna Meeting : CGER News Vol.20 No.1 (January 2010)
- Overcoming Barriers to low carbon societies “Six messages” from Stakeholders Dialogue in Yokohama (March 2010)
- Primer: Introduction to Low Carbon Societies (March 2010)
- Annual Report of the LCS-RNet: LCS Research 2009 (March 2010)
- LCS Database

## **7.5 Self evaluation**

### **(1) Relevance**

In addition to LCS-RNet activities, the Secretariat of the LCS-RNet has engaged in other activities under its own initiative aiming for capacity building, such as an internship and local stakeholders' dialogue in Indonesia, as well as promotion of LCS related research in Asia. The output of these activities will be reported at the next annual meeting of the LCS-RNet.

### **(2) Effectiveness**

It may be a bit too premature to consider the effectiveness of the Network on LCS policies. We are still struggling to involve major potential members, i.e. the US, Canada and China. India has already registered its five research institutions to the Network, and Indonesia is expressing its willingness to participate. Efforts to expand the Network, as well as to ensure the quality and usability of its output, must be continued.

### **(3) Efficiency**

Thanks to the strong support of the Italian Ministry of Environment, Land and Sea, the Steering Group members and the research focal points of participating research institutions to the LCS-RNet, cooperation within the network to organise the Inaugural Meeting and produce its output was successful. However, a reluctance amongst participating researchers to engage in joint research or a similar kind of collaborative work was observed, mainly due to busy schedules around the year of all. How to maximise the efficiency of networking is the challenge for the LCS-RNet.

### **(4) Outputs and Impacts Created**

The Synthesis Report of the Inaugural Meeting in Bologna provides an up-to-date bird's-eye view of LCS research in the world, which is unique compared to other research, publications and reports on LCS to date. By doing so, the future agenda for LCS research in a more integrated manner was identified under five key themes: targets, economic aspect of LCS, technologies, policies and behavioural change, and cross-cutting issues. These will become a good basis for the LCS-RNet to develop new research themes, and also be useful information for policy-makers who need to develop policies related to LCS.

## **7.6 Conclusion**

Through FY2009, the PMO performed the function of the Secretariat of the LCS-RNet. The following activities were completed and as a result outputs were produced.

- Tasks to set up the Secretariat for the LCS-RNet;
- Tasks to support organising the Kick-off Meeting and the Researchers Meeting that were organised by the Ministry of Environment, Land and the Sea, Italy;
- Tasks related with activities to promote research cooperation amongst participating research institutions;
- Publication of outputs of the LCS-RNet activities;

- Contribution to international negotiation processes on climate change through information sharing and promotion of the findings of the LCS-RNet;
- Capacity-building activities in the G8 Outreach countries;
- Tasks to develop the basis for LCS research in Asia.

The most important purpose of FY2009 through the above mentioned activities was to set up a firm base for collaboration amongst participating research institutions, as well as to extend membership to other countries.

Through the activities and outputs indicated above, a unique scope of the LCS-RNet to set “societies”, that are to face drastic changes to achieve large GHG mitigations in the mid- and long-term, as a key word, gained the concern of global research communities, policy-makers and other stakeholders.



# Economic Analysis Team

## 1. ERIA-SD Project - Mainstreaming Sustainable Development Policies in East Asia

### 1.1. Objective

Promotion of sustainable development (SD) that simultaneously achieves poverty alleviation, economic development and environmental protection is the most urgent issue in East Asia where both rapid economic growth and aggravating environmental problems are experienced. This research project aims to mainstream SD concerns into the policy-making process in this region. The research will first identify priority issues to promote SD. Then, effective policies to address priority issues will be formulated, based on prior (ex ante) policy assessment from the viewpoint of sustainable development, which is referred to in this project as Sustainable Development Policy Assessment (SDPA). SDPA will be applied to several policy issues to be addressed by other studies.

### 1.2. Major Findings

#### (1) Development of Analytical Tools for SDPA

In FY2008 the conceptual design of Integrated Policy Assessment Model (IPAM) was developed. The key features to be equipped by IPAM include (i) reflection of resource constraints in water, land, and forest, (ii) explicit treatment of public investment, and (iii) introduction of full dynamics.

Resources are treated as factor endowments and modify production functions of relevant sectors. It may be necessary to distinguish raw water and treated water as different commodities, because raw water is production factor of agriculture, the water utility sector and some water-intensive industries, while treated water is an output of the water utility sector and consumer goods.

Explicit treatment of public investment will be achieved by introducing a two-stage optimisation model in which the government controls public investment (level and allocation) in various infrastructure sectors.

Introduction of full dynamics will be achieved by introducing imperfect foresight assumption into Ramsey-Cass-Koopmans type dynamic CGE model.

#### (2) Institutional Capacity Development

In FY2008, a case study on Chinese water pollution control was conducted. It reviewed the evolution of environmental laws and regulations in China with special emphasis on the protection of water environment. Then, enforcement of environmental laws and regulations were analysed for the case of water pollution in the Taihu River Basin. This case study found that China's environmental management system consists of four levels that play an important role in environmental protection, but a dual leader system limits the effectiveness of local environmental protection bureaus. It also

found that China's environmental implementation measures have developed from single mandatory orders to integrated measures consisting of command and control, economic incentives, information disclosure, public participation and voluntary approaches, and more attention has been paid to economic incentives and other measures, although mandatory orders are still in a dominant position.

### ***(3) Impact of Integrated Watershed Projects on Sustainable Development in India***

In FY2009, a collaborative research project was conducted on Indian watershed programs to identify the impacts of watershed programs on sustainable development related issues in India. Rabindra Bharati University of Calcutta, India and IGES conducted this research jointly and published a research report titled "Impact of Integrated Watershed Projects on Sustainable Development in India: A Quantitative Approach". The main objective of this research was to estimate the optimal income level that each watershed project should generate for its beneficiaries to reduce or stop forced migration and to provide sustainability to the watershed project itself. Though we mainly looked into the sustainable development issue from an economic sustainability point of view, we also tried to incorporate issues of environmental sustainability maintained by the watersheds. A dynamic optimisation model was used to estimate the beneficiaries' optimal net present value of benefits in terms of their cooperative profit. An individual level optimal income was also derived to estimate the household level threshold benefit that every single watershed project should ensure in India. Data was collected from two major watershed covered states in western India. Our results suggest that for economic and social sustainability of the beneficiaries of a watershed project in India, there should be a minimum level of income generated from a watershed, which is currently not ensured in the country. Moreover, watershed catchment area should maintain a certain water level to ensure the local ecological balance which can turn into certain economic activities like maintaining fruit orchards, cattle grazing, fish cultivation, et cetera. The findings of this research will be converted into a policy document for the National Rainfed Area Authority (NRAA) Government of India, for their consideration to incorporate the findings into the National Watershed Guidelines.

### ***(4) Sustainable Development Review***

In FY2008 a policy report compiling country review papers was drafted. Each country paper was prepared by the Working Group member representing that country with a common structure specified by IGES. The structure of each country report is: (i) serious problems from economic growth, (ii) priority issues in order to promote SD, (iii) review of existing SD policies, and (iv) implementation problems of SD policies.

### ***(5) Application of SDPA***

In FY2008, a prototype of IPAM was applied to the cross-border energy infrastructure development issue. It was found that the impacts of cross-border energy infrastructure development projects vary on a case-by-case basis, and that this kind of broad impact assessment is helpful to identify the potential positive and negative impacts of these projects. Based on such information, it becomes possible to have a win-win situation for the region, provided that strong policy guidelines are set in place to look after issues like employment generation and economic benefits of the country as a whole.

### **1.3. Impacts Created: Inputs into Major Policy Processes**

The application of a prototype of IPAM to the cross-border energy infrastructure development issue was incorporated into the flagship project report of ADB entitled "Infrastructure for a Seamless Asia". This report will be a basis of ADB's aid policy in this field.

### **1.4. List of Publications**

#### **(1) Peer-reviewed**

Bhattacharya A. and S. Kojima. 2009 (forthcoming). Impact of Cross Border Energy Infrastructure Investment on Regional Environment, Society and Climate Change. In Chapter contribution for the Flagship Study: Infrastructure and Regional Cooperation. Tokyo. Asian Development Bank Institute.

#### **(2) Non Peer-reviewed**

Kojima S. 2008. Social, Economic and Environmental Impact Assessment of Environmental Policies under Regional Economic Integration in East Asia. In Annual Conference of the Society for Environmental Economics and Policy Studies (SEEPS) 2008, 27-28 September 2008 in Osaka.

Kojima S. 2008. REPA Model for Impact Assessment of Environmental Policies under Regional Economic Integration in East Asia. IGES-EA Working Paper 2008-001. Hayama, IGES.

Qi Y. and X. Zhou. 2009. Water Pollution Control in China: Review on laws, regulations and policies and their implementation.

Bhattacharya A. and Gupta. K. 2010. Impact of Integrated Watershed projects on Sustainable Development in India: A Quantitative Approach. IGES-RBU Collaborative Research Report.

#### **(3) Selected Presentations**

Kojima S. 2009. Integrated policy impact assessment CGE model for trade, environment and regional cooperation. ISAP 2009 EA session, 26 June 2009, Hayama.

Bhattacharya A. and S. Kojima. 2009. Impact of Cross Border Energy Infrastructure Investment on Regional Environment, Society and Climate Change. ISAP 2009 EA session, 26 June 2009, Hayama.

Kojima S. 2009. Integrated Policy Assessment Model. 3rd Working Group Meeting of ERIA-SD project, 12 and 13 March, 2009, Bogor, Indonesia.

Zhou X. 2009. Study on China's Enforcement of Water Pollution Prevention and Control. 3rd Working Group Meeting of ERIA-SD project, 12 and 13 March, 2009, Bogor, Indonesia.

Bhattacharya A. and K. Gupta. 2009. Sustainable Livelihood Based Watershed Management - "Watershed Plus" approach. 3rd Working Group Meeting of ERIA-SD project, 12 and 13 March, 2009, Bogor, Indonesia.

Onodera A. 2008. ERIA Institutional Study. 3rd Working Group Meeting of ERIA-SD project, 12 and 13 March, 2009, Bogor, Indonesia.

### **1.5. Self-evaluation**

#### **(1) Relevance**

This project reviewed the current situation of SD policies in selected Asian countries and planned

to develop integrated policy impact assessment tools to facilitate formulation of effective SD policies. This goal was highly relevant to the policy processes in this region where more and more quantitative assessment of policy impacts is demanded. This goal of the whole project could not be materialised within the scope of this project due to its cancellation, but this goal is inherited by the two environmental economics research projects mentioned below (Sections 5 and 6).

Concerning the watershed project, most studies were either case study based qualitative analysis which mainly focused on the institutional arrangement of a program or static partial equilibrium econometric analysis of a certain behavior of a parameter affecting the performance of a particular watershed. However, we found that the impacts of watershed projects in India are dynamic in nature and controlled by various exogenous constraints like water availability, human resource availability, agro-climatic restriction of agricultural production, upstream and downstream ecological conditions and so on. We found that it is important to investigate the Indian watershed projects from a dynamic perspective incorporating the impacts of various exogenous physical constraints in the system for better policy formulation. Rain-fed agriculture is the backbone of the Indian economy as it comprises more than 60 percent of the total agricultural production in the country. Therefore, watershed is the life line of India. Without proper watershed management it is impossible for India to improve the productivity of agriculture at a national scale. With burgeoning population and economic growth, improved rain-fed agriculture is a must for India and therefore, this research is very timely and relevant for India to improve its watershed policies.

Concerning cross-border energy infrastructure development, Asia is one of the most energy demanding regions in the world now. Around five to six trillion USD worth of investment is required in this region to meet the future demand. A coordinated approach is needed to harness these investments in this sector. Cross border energy infrastructure development is an economically efficient and effective mechanism to do that. Multilateral donor agencies including the World Bank and ADB are actively promoting this in this region. Therefore, our research is a timely work in the context of building an enabling environment in Asia where all countries can work together to build a seamless infrastructure development network. Our research is relevant in the context of demonstrating the overall economic benefits (in terms of GDP) of all the participating countries in this initiative and also in terms of environmental benefits (in terms of CO<sub>2</sub> emissions) which can additionally contribute to the global battle against climate change.

## ***(2) Effectiveness***

Concerning the watershed project, the Government of India (GoI) in the year of 2006 set up the National Rainfed Area Authority to look after the issues of overall development of the rain-fed areas in the country with a special focus on watershed project development. So far, over the last fifty years, GoI has been investing billions of INR (Indian rupees) in watershed projects to uplift the marginal and poor people living in those areas. Based on the latest review report (Parthasarati Commission Report) it has also been observed that due to poor planning and management very little impacts have been realised in the watershed areas, in terms of poverty eradication and agricultural productivity improvement. This report also suggested further studies in the area of economic benefit estimation of a particular watershed and development of certain measurable and verifiable indicators for a better monitoring system of the existing and the up-coming watersheds in the country. In this research we tried to contribute to these aspects in identifying a measurable and verifiable indicator for watersheds such as, "income generation" affecting the "rate of local area migration" and thereafter sustainability of the project itself. This research can help NRAA to incorporate a

measurable and verifiable indicator in the list of watershed project evaluation criteria.

Concerning cross-border energy infrastructure development, ADB and the World Bank have long been discussing the creation of an infrastructure development fund for Asia to support and promote massive infrastructure development projects to even out regional economic growth. As a matter of fact, in 2008, ADB decided to create a pan-Asian Infrastructure Fund (AIF) to support cross-border projects including energy and transport. The effectiveness of our study relies on the further corroboration of the need of this kind of a multi-country infrastructure development fund to broadly address the issues of narrowing the development gap and poverty eradication in this region.

### ***(3) Efficiency***

When this study was started, the funding source (ERIA) was under development, and there was great uncertainty in administrative procedures. Still we successfully established a Working Group consisting of prominent experts in the ASEAN region, organised three Working Group Meetings and carried out supporting studies according to the research plan. Considering these challenging circumstances, the study was regarded as very efficient in maximising the benefits from collaboration with local research institutes.

### ***(4) Outputs and Impacts Created***

The project as a whole produced the final report of FY2009 activities; however, this is just a progress report of the first year activities. The cancellation of the project prevents us from generating tangible outputs and creating impacts.

Regarding the watershed project, it is expected that the research output will be converted into a policy tool to measure the performance and effectiveness of existing watershed projects in India and also used to develop a proposal for a new watershed project in the country. This result can further be extended toward application in other countries with similar agro-climatic conditions.

Regarding the cross-border energy infrastructure development, it is difficult to identify the specific impact of our study within the overall framework of a seamless Asian infrastructure development process. But as this study constructively supports the reasoning and need for such initiatives in this region through its model results, it has indeed created an impact. Creation of the Asian Infrastructure Fund could be the biggest example of a contribution to the impact creation of this study.

## ***1.6. Conclusion***

This study was started as three-year study and regarded as the core of the research activities of the Economic Analysis Team, involving all research staff. This study was also unique as it responded to the request of the Ministry of Economy, Trade and Industry that took the initiative to establish the ERIA. This activity entailed great uncertainty in various respects, and EA had to spend significant time and human resources to set up this research project. We believe these efforts were valuable to enlarge potential channels to actual policy processes.

Unfortunately due to the unexpected financial and political circumstances of ERIA, the final two years of activities of this study were cancelled along with other ERIA-SD studies conducted by other research institutes. Thus, we could not produce tangible outputs and generate impacts as planned.

except for the abovementioned outputs from some sub-components of this study. However, the goal of this study will be succeeded by the new environmental economics studies mentioned in Sections 5 and 6, and through these new studies we plan to generate such policy impacts.

## **2. Accounting for Embodied Emissions and Implications for Low-Carbon Policies**

### **2.1. Objective**

Accounting for CO<sub>2</sub> emissions embodied in international trade has potential implications for global climate policies, which relate to such issues as carbon leakage, border adjustment measures and the fairness of allocating responsibility for emissions embodied in international trade. These issues have yet been properly discussed by either the trade regime or the climate regime. Research questions include: (i) how to account for embodied emissions in national GHG accounting; and (ii) for policies addressing the issue of carbon leakage and international competitiveness, such as border adjustment and responsibility allocation between importing and exporting countries, what are the implications for domestic climate policies and what are the impacts on global GHG emissions. The purpose of this research is to try to answer these questions based on quantitative analysis. The research results will help national policy-makers and negotiators to address the carbon leakage issue both domestically and at the level of climate and trade regimes.

### **2.2. Major Findings**

#### **(1) Accounting for Emissions Embodied in International Trade**

Based on the Multi-Region Input-Output Model (MRIO), we calculated emissions embodied in international trade in the year 2000 for ten selected Asia-Pacific economies (including five ASEAN countries, China, Taiwan, the Republic of Korea, Japan and USA). We calculated national responsible emissions based on three responsibility allocation schemes: (i) full producer responsibility; (ii) full consumer responsibility; and (iii) shared producer and consumer responsibility based on the ratio of value-added. We found that embodied CO<sub>2</sub> accounted for 13 percent of the total emissions from ten economies. Accounting based on full consumer responsibility changes current national GHG inventories significantly, ranging from -525 Mt-CO<sub>2</sub> for China to 543 Mt-CO<sub>2</sub> for the USA. In terms of trade balance of embodied CO<sub>2</sub>, the USA (-464 Mt-CO<sub>2</sub>), Japan (-189 Mt-CO<sub>2</sub>) and Singapore (-13 Mt-CO<sub>2</sub>) have trade deficits, while other economies, in particular China (452 Mt-CO<sub>2</sub>), have a trade surplus.

#### **(2) Test of the Robustness of Accounting Methods**

We tested the robustness of accounting methods and analysed factors influencing the calculation results. We conducted sensitivity analysis using (i) the single-region input-output model (SRIO); (ii) the multi-region input-output model (MRIO); (iii) emissions embodied in bilateral trade (EEBT); and (iv) different degrees of sector aggregation. We found that results are sensitive to the methods employed and to the degree of sector aggregation. To address the issue of embodied emissions, agreement on the accounting method is necessary.

### **2.3. Impacts Created: Inputs into Major Policy Processes**

During Phase 4 this study has focused on academic research. In the next phase, the emphasis will be placed on policy analysis and will contribute to trade and climate policy processes. For academic influence, part of the research work was included in the book *Input-Output Analysis Explained*, to be published in June and released during the 18th International Input-Output Conference 2010. This book is aimed at general readers focusing on input-output analysis tools for climate change issues.

### **2.4. List of Publications**

#### **(1) Book Chapter with Peer Review**

Zhou X. 2010 (forthcoming). Chapter 14 Environmentally extended multi-region input-output model: Sharing responsibility across the globe. In Murray J. and R. Wood. (ed.) *Input-Output Analysis Explained*. Common Ground, the University of Illinois, USA.

#### **(2) Journal Article with Peer Review**

Zhou X. 2009. How does trade adjustment influence national inventory of open economies: Accounting for embodied carbon emissions based on multi-region input-output model. *Environmental Systems Research*, Vol. 37, pp. 255-262.

#### **(3) IGES Publication (Research Report)**

Zhou X., X.B. Liu and S. Kojima (Ed.). 2010. *Carbon Emissions Embodied in International Trade: An assessment from the Asian perspective*. Institute for Global Environmental Strategies (IGES), Hayama, Japan.

#### **(4) Proceedings and Presentations**

Zhou X. Accounting national emissions adjusted for trade: How will consumption-based approach make a change in response to climate change? International Forum for Sustainable Asia and the Pacific (ISAP), 26-27 June 2009, Hayama, Japan.

Zhou X. and S. Kojima. How does trade adjustment influence national inventory of open economies: Accounting embodied carbon based on multi-region input-output model. 17<sup>th</sup> International Input-Output Conference, 13-17 July 2009, Sao Paulo, Brazil.

Zhou X. How does trade adjustment influence national inventory of open economies: Accounting for embodied carbon emissions based on multi-region input-output model. 37<sup>th</sup> Annual Meeting of Environmental Systems Research 2009, Committee on Environmental Systems, Japan Society of Civil Engineers, 24-25 October 2009, Tokyo, Japan.

### **2.5. Self-evaluation**

#### **(1) Relevance**

Carbon leakage and international competitiveness are two central concerns in international negotiations for a future climate regime. CO<sub>2</sub> emissions embodied in international trade are related to both concerns. From this viewpoint, the research topic is very relevant to international climate

policy. Quantitative policy assessment of the impacts of the changing responsibility principle will help inform policy-makers and negotiators who are considering measures to address the carbon leakage concern. Therefore this research is relevant to policy-making at both the domestic level and international level.

## **(2) Effectiveness**

From an academic point of view, this study generated some impacts as shown above and can be considered effective (medium). From a policy point of view, it has received much attention from BOD members and other institutions. However, policy assessment will be the task in Phase 5. The overall effectiveness is medium in Phase 4.

## **(3) Efficiency**

The study is efficient considering the limited human resources and budget spent on it.

## **(4) Outputs and Impacts Created**

One book chapter with peer review, one peer-reviewed journal article, one IGES publication (research report) and three presentations at international conferences were produced as outputs. Medium impacts were created in the academic domain and limited impacts were created in the policy domain (mainly because policy assessment will be conducted in Phase 5).

## **2.6. Conclusion**

This study successfully fulfilled all targets against set milestones. Generation of policy impacts will be the challenge for Phase 5.

# **3. Japan Low-Carbon Society Scenario toward 2050**

## **3.1. Objective**

Japan Low-Carbon Society (LCS) scenarios depict the technological potential to reduce Japanese CO<sub>2</sub> emissions by 60 to 80 percent from the 1990 level by the year 2050 with satisfying necessary service demands. Such a drastic carbon emissions reduction may require changes in industrial structure, such as a shift from heavy industry to the service industry. It is also anticipated that Japanese low-carbon measures may have international impacts through the trade network. In order to analyse potential impacts of Japan LCS scenarios on industrial structure as well as on international trade patterns as a part of scenario development, this research conducted quantitative analysis on trade and industrial structure under Japanese low-carbon scenarios using an analytical tool developed by customising a widely-used multiregional computable general equilibrium model, the GTAP-E model.

### **3.2. Major Findings**

The nature of potential international impacts of Japan LCS Scenarios were found to be complex. Overall direction of impacts depends on the balance between productivity gain from energy efficient technologies and productivity loss due to additional investment (and operation) costs of such technologies, among others (e.g. price distortion due to carbon tax).

It was also found that the Japan LCS scenarios can reduce vulnerability of the economy against crude oil price hikes, particularly when carbon pricing is introduced. These results demonstrate the potential synergy between climate change mitigation policy and a certain aspect of energy security.

### **3.3. Impacts Created: Inputs into Major Policy Processes**

This research was conducted as a part of a five-year project "Japan Low-Carbon Society Scenario toward 2050" led by the National Institute for Environmental Studies. This five-year project as a whole demonstrated the technological potential to reduce Japanese CO<sub>2</sub> emissions by 60 to 80 percent from the 1990 level by the year 2050 with satisfying necessary service demands. It has influenced Japanese climate policy, exemplified by the climate policy related vision statements by Japanese prime ministers, particularly in the Fukuda Vision released in June 2008 that announced the Japanese long-term CO<sub>2</sub> emissions reduction target by 2050 to be a 60 to 80 percent reduction from the current level.

### **3.4. List of Publications**

#### **(1) Selected Presentations**

Kojima S. 2009. International impacts of Japan Low Carbon Society Scenario. LCS2050 Project International Symposium, 26 February 2009, Tokyo.

Kojima S. 2009. Japanese new climate policy and prospect of emission trading schemes. 2nd International Conference on Climate Change Response, 5 November 2009, Gwangju.

### **3.5. Self-evaluation**

#### **(1) Relevance**

Long-term and mid-term scenarios towards low-carbon society are a priority policy agenda for the Japanese government. The IGES component contributed to this highly relevant to policy research project led by NIES in terms of drawing attention to the international dimension of Japanese low-carbon policy.

#### **(2) Effectiveness**

This research demonstrated the importance of considering the international spillover effects of Japanese low-carbon society policy and also drew attention to potential benefits of international (or regional) cooperation to implement low-carbon policies. This idea is reflected in the succeeding low-carbon related project led by NIES, which focuses on low-carbon development in Asia.

### **(3) Efficiency**

IGES was invited to this project to salvage a deadlocked subcomponent, and a significant amount of resources were allocated for this purpose in the first year (FY2007). The second year (FY2008) operation was efficient considering limited human and financial resources.

### **(4) Outputs and Impacts Created**

The first year IGES organised an international symposium about this project attended by about 600 people and covered by the Nikkei newspaper. In the second year IGES organised another international symposium attend by about 200 people, and we reported research findings at that symposium. These activities may have contributed to improve IGES presence in this field.

## **3.6. Conclusion**

This study was started to respond to a request from NIES to re-orientate a deadlocked component related to the international dimension of Japanese low-carbon scenarios. It entailed some difficulty in coordinating with partners who did not follow the overall direction of NIES. We managed to overcome this difficulty and finally we completed this project successfully. It certainly contributed to the current research collaboration between NIES and IGES in ongoing research related to Asian low-carbon development.

## **4. Biofuel Use Strategies for Sustainable Development (BforSD)**

### **4.1. Objective**

The overall goal of this project is to propose policy options to utilise biofuels for promoting sustainable development in Asia and the Pacific region. To do so, we focus on Indonesia, China and India as examples of developing countries and Japan as a developed country to study national and local level policies as well as relationships among these countries to investigate the need for regional policies. EA is in charge of a case study in India and quantitative impact assessment of biofuel policies.

### **4.2. Major Findings**

For the India case study, the major findings are as follows:

- A national policy has been discussed for several years, but not finalised due to disagreements within the government about the overall direction. There are a variety of policies at the state level. Many actions are decentralised and uncoordinated.
- Plans to rely on feedstocks such as jatropha, which can grow on wasteland and require little water, may be unrealistic. Jatropha and other similar crops need land, water, labour and capital just like other agricultural products. India may not have sufficient resources for biofuels, especially land and water.
- The Indian biofuel market is very new and there is little policy support for biofuel suppliers.

Biofuel production cost is much higher (15 to 20 percent) than its market price.

- Biofuel demand is mainly for five percent ethanol blending mandate. Bio-diesel is still used only at the very local level, and there is no national scale infrastructure. Sugar cane is the single largest source of bio-ethanol.
- Biofuel R&D needs to resolve issues like efficient harvesting of ripe fruits, minimum yield under severe conditions (for jatropha), and commercialisation of the second and third generation biofuels.
- Resource constraint will be a major pull-back force for biofuel development in India. Water scarcity will be a major resource constraint for India to attain the desired level of biofuel production especially from sugar based ethanol. Sugar cane is one of the most water consuming crops in India. Nevertheless, the majority of its production is ground water irrigation based. Unfortunately, the majority of the sugar cane production is also happening in the water stressed areas in India where groundwater reserves are very low. Our research shows that with the current level of water consumption in sugar cane production and with a given ground water reserve, India can maintain its current level of sugarcane production only for another five years or so. Consequently, bio-ethanol production will also be hampered seriously. Sugar cane based ethanol production is at stake due to severe water shortage in the country.
- Indian bio-diesel production is yet to reach the national scale. Therefore, the majority of the target will be fulfilled by sugar cane based ethanol in the near future. Unfortunately, Indian domestic sugar demand is surpassing the domestic production, and there is an increasing trend of import. This situation will continue unless domestic sugar cane production is increased by around 30 percent. With this given condition, the Indian target of ethanol blending of 20 percent by 2020 appears very optimistic and rather unrealistic.
- New National Biofuel Policy which is a revised version of an earlier publication of the same is lacking in specificity and real-term objectives. As a matter of fact, this policy provides no direction except mentioning some very general targets without much thought. A set of additional policies is required to make this national policy function. Due to inter-departmental conflicts of interest, such coordination is a distant reality for India and therefore, the success of such national policy is in jeopardy.

For the quantitative impact assessment, the major findings from simulations for hypothetical Japanese biofuel policies are as follows:

- A 20 percent reduction in import tariffs on biofuels would drastically increase biofuel imports, and thus would have large impacts on biofuel exporting countries.
- Greening tax (20 percent fossil fuel tax and 20 percent biofuel subsidy) would have significant impacts on biofuel production and consumption, and CO<sub>2</sub> emissions in Japan.

### ***4.3. Impacts Created: Inputs into Major Policy Processes***

The case study in India has been conducted through interaction with Indian ministry officers relevant to biofuel policies. The outputs of this case study, together with quantitative analysis results, will contribute to policy processes.

### ***4.4. List of Publications***

#### ***(1) Selected Presentations***

Kojima S. 2010. Impacts of biofuel promotion policy in India: an assessment using a dynamic CGE

model. International Symposium on a Sustainable Future (ISSF-2010), 11-13 January 2010, Mumbai.

Bhattachrya A. 2010. Biofuel production and water constraint: An effective utilisation of Watershed Projects in India. International Symposium on a Sustainable Future (ISSF-2010), 11-13 January 2010, Mumbai.

## **4.5. Self-evaluation**

### **(1) Relevance**

Biofuels are supposed to be alternatives to conventional motor fuels. In the midst of a fuel crisis and escalating prices of conventional fuels, biofuels appeared to be a silver lining. During early 2000, the myth that biofuels can resolve the fuel crisis issue forever and also clean the environment spread. Billions of dollars were invested across the world to pursue this target. But soon all dreams came to be non-existent when after five years of effort not even five percent of global motor fuel demand could be met by biofuels. Not only that, during this period great social unrest and many political fiascos were created across the world over the food-fuel conflict, and all the steam of biofuel promotion was vented out very soon. Amidst this confusion about biofuels' sustainability and the impact of biofuels on sustainable development, this project has contributed towards social and environmental issues of biofuels in the Asian region, which is the so-called potential Middle East of biofuels. Apart from the economics of biofuels and their contribution towards overall energy security, biofuels have impacts on local society and environment too. Especially countries like India, China, and Indonesia are encouraging biofuels mainly from the social development point of view, if not for environmental benefits. Our BforSD project is therefore rightly contributing towards these objectives of the governments in this region.

### **(2) Effectiveness**

Asian governments are actively pursuing to first understand and then to formulate certain guiding principles to promote and develop biofuels in their respective countries. Biofuels have already created plenty of confusion and concern all across the world. But still given the Asian situation, there is a certain potential to produce biofuels which can displace a certain amount of fossil fuel demand indeed. However, it is yet to be determined what percentage can be produced without much social and environmental problems. Our research is effective in the sense of finding out that magic number, if possible, by the governments in Asia.

### **(3) Efficiency**

This project was carried out in an efficient manner considering limited human and financial resources utilising collaboration with local research institutes.

### **(4) Outputs and Impacts Created**

This project is a three-year project ending in FY2010. Therefore, during the 4th phase we completed only the first two years of this project. Our final results and conclusions are yet to be developed. However, so far what we have found and published has created good impacts at the high policy-making level in countries like Indonesia and India. We conducted research workshops in India

and Indonesia both along with our local research partners, which created good impacts among high-level policy-makers in these countries. In Indonesia, especially, we got involved in a national level informal biofuel steering committee as an official observer. Several discussions happened at the policy formulation level with high-level policy-makers in India, and our ideas and findings received appreciation. It is hard to document the impacts of our research so quickly, but our research is surely in line with the reality and needs of the time.

#### **4.6. Conclusion**

This project still has one more year to be completed and therefore, final conclusions are yet to be determined. However, based on the last two years' research, it has been observed that first generation biofuels are not a perfect substitute for fossil fuels in Asia. Plant-based biofuels have several drawbacks and difficulties upstream as well as downstream. Upstream problems are mainly governed by food-fuel conflicts and downstream problems are governed by the pricing of biofuels. As a matter of fact, unless governments provide subsidies to biofuel producers, it is difficult for them to be competitive with fossil fuels available in the market. There is a bottleneck for the governments to determine an efficient pricing system for biofuels in the country which are coming from several sources and with varied ranges of quality and quantity. Our results temporarily conclude that cellulosic and algae based biofuels could be viable alternatives for Asia, which avoid the food-fuel conflict as well as the pricing problem due to mass production from a single source with uniform quality.

## **5. Research on Environmental, Economic, and Social Impacts of Resource Circulation Systems in Asia**

### **5.1. Objective**

Sustainable development under pressing scarcity requires decoupling of resource consumption and economic growth, for which stable and environmentally and economically benign resource circulation systems must be established. Concerning resource circulation systems, urgent policy issues include decline of domestic resource circulation systems due to recyclables exports to developing countries and environmental and health problems caused by improper informal recycling activities in developing countries. This research aims to provide useful information to formulate effective resource circulation policy options which will mitigate resource constraints while satisfying environmental and social constraints.

### **5.2. Major Findings**

This research was started very recently (October 2009) as collaborative research with IGES-WMR, the University of Tokyo and Kansai University. The EA component has so far made the following progress on development of IPAM.

- As a database for multi-region CGE model, an 18-region 38-sector global social accounting matrix (SAM) was constructed based on the GTAP database. One important shortcoming of the GTAP database, i.e. lack of explicit budget constraint of household and government, was

overcome by eliminating “regional household” following McDonald and Sonmez (2004).

- Currently calibration of parameters and initial values based on the SAM is being undertaken. This version employs fixed saving ratio to total household income (i.e. fall into Solow-Swan growth model). Once this prototype model is ready, we will incorporate energy use and GHG emissions data as well as resource use data.
- We also started the development of a full dynamic CGE model. This model falls into the Ramsey-Cass-Koopmans growth model, but it replaces perfect foresight assumption in expectation formation by imperfect foresight assumption in which households form their expectation for future price paths based solely on current price information. Then, for each time step they update their expectation formation with new information. This model distinguishes household asset accumulation (which is “value” or money without physical quantity) and private capital accumulation (which is physical quantity and subject to depreciation), which are often treated as identical.
- Currently the BAU simulation was successful, but giving policy shocks, such as significant increase in import tariffs, caused errors.

### **5.3. Impacts Created: Inputs into Major Policy Processes**

This research was started very recently (October 2009) and it needs some time to provide tangible results relevant to policy processes. Still, we established good relations with important policy processes such as OECD sustainable material management (SMM) and the UNEP Resource Panel. In particular OECD is interested in the potential contribution of this study to their next Environmental Outlook to be published in 2012.

### **5.4. List of Publications**

#### **(1) Selected Presentations**

- Kojima S. 2010. FY2009 Progress of the Research on environmental, economic, and social impacts of resource circulation systems in Asia. The 2nd Workshop of “Asia Resource Circulation Policy Research”, 15 March 2010, Tokyo.
- Kojima S. 2009. Research on environmental, economic, and social impacts of resource circulation systems in Asia. Inaugural Workshop of the Asia Resource Circulation Research Project, 10 November 2009, Tokyo.
- Kojima S. 2009. Impacts of East Asian economic integration on waste management and recycling policies. Seminar on economic development and environmental policies, Kyoto University, 8 October 2009, Kyoto.

### **5.5. Self-evaluation**

#### **(1) Relevance**

This research project well reflects MOEJ’s intention to formulate the Asia 3R vision. Also it is expected to contribute to other international policy processes such as OECD SMM and the UNEP Resource Panel. The relevance to actual policy processes is very high.

**(2) Effectiveness**

This research significantly contributed to development of IPAM, which will be one of the main analytical tools for the Economy and Environment Group in the fifth phase.

**(3) Efficiency**

This research efficiently achieved the targets specified in the research plan within the planned budget and human resource inputs.

**(4) Outputs and Impacts Created**

It is too early to generate tangible outputs from this research as this three-year research started just 6 months ago. We expect to produce tangible outputs that will have impacts on policy process during FY2010 and FY2011.

**5.6. Conclusion**

This new and significant policy research so far achieved the targets specified in the research plan, but it is too early to produce tangible outputs as of now. The relevance of this policy research to actual policy processes is definitely high and it will be one of main activities of the Economy and Environment Group in the fifth phase.

**6. Research on Policy Options for Sustainable Use of Ecosystem Services through Internalisation of Economic Values of Ecosystem Services****6.1. Objective**

This research aims to formulate policy options for sustainable use of ecosystem services that internalise economic values of ecosystem services into market mechanism and prevent loss or damage of ecosystem services. For this purpose, this research will examine innovative financial mechanisms like Payment for Ecosystem Services (PES), and will develop theoretical framework and quantitative assessment tools to conduct policy impact assessment.

**6.2. Major Findings**

Major findings of five research issues relevant to sustainable use of ecosystem services conducted by the EA team are as follows:

- Through a literature review regarding the economic value of ecosystem services, the number of studies in Asian countries is far less than those conducted in European and North American countries, implying that accumulation of research will be required hereafter.
- By means of questionnaire survey as well as econometric analysis, it was revealed that willingness to pay for the value of biodiversity is decreasing in time and space, namely, lesser amounts of money tend to be bid for the distant future and for areas recognised as distant by

respondents.

- Portfolio simulation analysis for ecosystem restoration demonstrated that compatibility between diversification of investment and improvement of economic performance could be applied in this field as well. Furthermore, some constraints on allocation of investment based on assumed policies would reduce economic performance.
- From the economic experiment on the trade of ecosystem services, this market showed a similar level in efficiency compared to other auction mechanisms. Additionally, multi-regression analysis demonstrated the substantial difference in factors for decision-making between developers and bankers (providers).
- Some literature focused on the introduction of ecosystem services into production and utility functions, which could be applied into economic modeling for policy impact assessments hereafter.

### ***6.3. Impacts Created: Inputs into Major Policy Processes***

As this is the first year of this research project, it was difficult to make significant political impacts or inputs into major policy processes. The studies conducted this year, however, could be the initial step towards the final goal in which we will propose effective and efficient policy options relevant to the sustainable use of ecosystem services.

### ***6.4. List of Publications***

None.

### ***6.5. Self-evaluation***

#### ***(1) Relevance***

Ecosystem services play a vital role not only in economic activities but also in human life itself. In this sense, sustainable use of these services on a global scale is essential for the sustainable development and livelihood of humanity, which will be the ultimate goal of current economic environmental policies. Also, this research project is compatible with the objectives of the EA team in terms of conducting quantitative analysis for policy impact assessment through economic modeling and econometrics.

#### ***(2) Effectiveness***

Originally, the main objective of the first project year was basic academic research including literature reviews. Hence, our technical research outputs such as econometric analysis based on the questionnaire survey and economic experiments, as well as economic simulation analysis, could be well evaluated as they were beyond just basic research. Indeed, each economic analysis was assessed well by the external trustees of this project. From the political perspective, however, we will need greater commitment and intention to propose effective political options in the end.

### ***(3) Efficiency***

Although we spent a large budget on research, our outputs are worthy of it. Similarly, time allocation for this project on the whole is well-suited.

### ***(4) Outputs and impacts created***

As already mentioned in section (2), we produced several well-evaluated outputs, although they might lack in political impact.

## **6.6. Conclusion**

By and large, this project is progressing in a proper direction. Academic research based on the quantitative analysis was conducted appropriately in the first year as an initial step, and can be further improved in the next term. Although we may need a slight modification towards more clearly policy-oriented research hereafter, our ultimate goal to propose policy options for sustainable use of ecosystem services is unchanged from the beginning.



# Policy and Governance Team

## 1. Promotion of Urban/Local Initiatives for Sustainable Society

### 1.1. Objectives

This study explored how urban/local initiatives can facilitate the establishment of a sustainable society through the following:

- Sharing lessons learnt from successful (and failed) cases among local stakeholders
- Understanding complementarity among actions taken by multiple stakeholders
- Proposing policy options for further promotion of such urban/local initiatives

### 1.2. Major Findings

#### *(1) International intercity network programme for the environment*

The extent of mutual learning through international intercity network programmes for the environment in Asia, such as CITYNET, ICLEI-Southeast Asia and the Kitakyushu Initiative for a Clean Environment, was assessed. Based on participation records of network activities, records of formulation of bi-lateral intercity relations, and a survey of participating cities, the study claims that international intercity networks in Asia have achieved some modest results in terms of mutual reference and learning among participating cities in relation to the financial resources the networks have been able to mobilise. There may be room to further enhance mutual learning if national governments and international organisations could maintain or increase their financial support of international intercity network programmes even modestly.

Despite the mandate of local administration and fiscal constraints, several Japanese local governments have extended international cooperation to local governments in developing countries in Asia, aiming for better environmental management in the region. The study examined the different drivers of international environmental cooperation of different cities, classifying the drivers into two categories: tangible and non-tangible. An analysis of cases of 12 Japanese cities engaged in international environmental cooperation suggests that tangible drivers include the desire to utilise local human capital related to environmental management, the promotion of environmental businesses, and the prevention of trans-boundary pollution. Non-tangible drivers, such as a sense of pride in sharing the responsibility of environmental protection and conservation and a sense of sharing global issues beyond national borders, were also suggested. The cities of Kitakyushu and Yokohama are the representatives for the two patterns.

An analysis was conducted on factors that contributed to the adoption and diffusion of environmental practices at the city level via Asian intercity networks. The main endogenous factors at the city level include the importance of support at the mayoral level, coordination and networking of stakeholders by individuals and organisations within and outside of the local government, autonomy of awareness of the city government, including the mayor, and administrative and financial

autonomy of local governments from central and regional governments. The main exogenous factors were the existence of policy support (especially financial) from the national and regional governments, active participation in international networks, adequate communication with stakeholders, and introduction of policies that help solve local issues. Finally, two factors related to participation in intercity network programmes that have the potential to contribute to improving support and capacity of stakeholders, such as mayors and staff in related departments, were determined. These are sharing of a sense of purpose with similar cities through participation in networks, and dissemination of information outside the city through networks.

An international workshop on an international platform for sustainable cities was held in collaboration with the city of Kawasaki of Japan, the United Nations Environmental Programme International Environmental Technology Centre (UNEP IETC), and the National Institute for Environmental Studies (NIES) of Japan, with the participation of Asian cities. Based on discussions at the workshop and the above mentioned studies, draft guidelines for an international platform for sustainable cities aiming at the effective formulation and utilisation of international intercity network programmes were developed.

## ***(2) Low-carbon development of Asian cities in developing countries through international intercity collaboration***

Regarding the potential role of local government policies and practices to enhance low-carbon development in Asian developing countries, the preliminary findings of this study show that there is room to implement low-carbon development policies in the areas of buildings, households, small and medium enterprises and waste, depending on the level of economic development.

The study found that several Japanese municipal governments have set ambitious goals for reducing greenhouse gas (GHG) emissions and have conducted comprehensive policies and practices, yet they also face difficulties in monitoring specific GHG emissions reduction costs and in estimating accurate effects and impacts of implementation of policies and practices on GHG emissions reductions.

The organisational structure of international intercity networks, including governance and funding, was studied, as previous studies did not cover these areas. Extensive interviews were conducted with seven international intercity networks. According to the interviews, rotation of the presidency was identified as one of the keys to maintain active participation of member cities. In terms of funding, CITYNET, ICLEI, and C40 were identified as successful networks in receiving financial support from various institutions. There are some controversies regarding membership fees. Networks like C40 and the International Carbon Action Partnership (ICAP) consider membership fees to be unnecessary, as participating cities already bear the costs of hosting events and conferences. In contrast, CITYNET and ICLEI consider them to be essential to support secretariat functions and maintain the network's neutrality. Regarding low carbon development in Asia, a purchasing consortium was identified as one promising possible new programme area for intercity network programmes.

The study assessed several ways to promote increased engagement by Japanese local governments in international intercity collaboration with local governments in Asian developing countries. The preliminary suggestion of this study is that technical assistance for capacity development of Asian cities, as well as collaboration to promote environment and energy business that contributes to low-carbon development, are two areas that have potential if combined with

national government support. Utilisation of carbon finance or promotion of citizen engagement in low-carbon development projects overseas is probably not feasible at present for Japanese local governments. To facilitate the engagement of Japanese local governments in intercity collaboration towards low-carbon development in Asia, it is suggested that the Japanese government provide support to develop an international platform for low-carbon cities with regard to financial and personnel resources, including the development of a special budget account for international collaboration of local governments under the Hatoyama Initiative. It is recommended that the international platform secretariat link identification of co-benefit type low-carbon development programmes in developing Asia, funding opportunities, technical assistance by Japanese local governments, and capacity development on measuring and reporting on GHG emissions reduction in developing countries, to incorporate the different interests of developing and developed countries.

### ***(3) Financial mechanisms that could facilitate urban/local initiatives on development and climate change mitigation***

The study found that there were increasing numbers of development oriented clean development mechanism (CDM) projects in China, Indonesia and the Philippines. Also, there are a few climate change mitigation projects for carbon offsetting in Indonesia, and some low-carbon community development projects without carbon credits that are funded by contributions and donations in the Philippines and Indonesia. There were no such projects funded by not-for-profit finance.

Based on these findings, the study suggests the following. Local governments should select, revise and implement appropriate developmental programmes that have GHG emissions reduction effects, utilising carbon finance schemes. Local governments are also encouraged to develop and extend a programmatic approach which aggregates many small-scale projects in a certain geographical area so that low-carbon projects can contribute to existing developmental programmes as well as generate revenues from carbon credit production and sales. National governments could support the use of the programmatic framework. Local governments would also be able to promote two-step loans to finance low-carbon community development projects by means of effective coordination with national governments and international/local financial institutions. Local governments that are already committed to or interested in developing energy and resource efficient economies could learn from the experiences and knowledge of other local governments using the formal and informal networks of individuals and organisations.

## ***1.3. Impacts Created: Inputs into Major Policy Processes***

### ***(1) International intercity network programme for the environment***

Inputs were made at the international workshop of the 6<sup>th</sup> Asia-Pacific Eco-Business Forum in Kawasaki, Japan, which was organised by the city of Kawasaki, UNEP IETC, NIES and IGES in February 2010, in terms of the effective utilisation of an international platform for sustainable cities.

### ***(2) Low-carbon development of Asian cities in developing countries through international intercity collaboration***

Preliminary findings and proposals were presented at workshops where inputs were made to Japanese local governments, city governments from several Asian developing countries,

international intercity network programmes, and international development organisations, in terms of possible ideas to enhance international intercity network programmes that could contribute to low-carbon development in Asia. One domestic workshop and one international workshop were co-organised with partner research institutes in Japan to present and discuss on low-carbon development policies and practices of local government and possible international collaboration.

#### **1.4. List of Publications**

##### **(1) International intercity network programme for the environment**

###### **Reports**

- Nakamura, H., Forthcoming. "Ajia kankyo toshikan nettowaku wo tsujita sogo gakushu (Mutual learning through Asian intercity network programme for the environment)" in K. Mori, S. Urata and K. Kurita (Ed.) Jichitai no kokusaika to higashi ajia nettowaku (Internationalisation of municipal governments and East Asian network. Research Unit of Network Analysis in Asia, Organisation for Asian Studies, Waseda University.
- Nakamura, H., M. Elder and H. Mori, 2010. Mutual learning through Asian intercity network programmes for the environment. Institute for Global Environmental Strategies.
- Fujikura, R., H. Mori, D. Sano, and H. Nakamura, 2010. Draft Guideline of International Platform for Sustainable Cities. Institute for Global Environmental Strategies.
- Fujikura, R., H. Mori, D. Sano, and H. Nakamura, 2010. Higashi ajia deno jizoku kanou na toshi, seisaku, gijutsu sinario no purattofomu ni kansuru kenkyu (Study on East Asian platform for sustainable urban policy and technology scenario), Institute for Global Environmental Strategies.
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- PUSTRAL. 2008. Final Report of Study on Practice Diffusion and Adoption Process under Cities for Climate Protection (CCP) Programme in Indonesia. Hayama, Japan: Institute for Global Environmental Strategies.
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- Aquittania, V. E., 2008. Final Report of Study on Practice Diffusion and Adoption Process under Cities for Climate Protection (CCP) Programme in the Philippines. Hayama, Japan: Institute of Global Environmental Strategies.
- Hosei University and IGES, 2008. Higashi ajia deno jizoku kanou na toshi, seisaku, gijutsu sinario no purattofomu ni kansuru kenkyu (Study on East Asian platform for sustainable urban policy and technology scenario), Institute for Global Environmental Strategies.

## ***Presentations***

- Nakamura, H., 2010. "International platform to promote policies and technologies for sustainable cities in Asia," at the 6<sup>th</sup> Asia-Pacific Eco-Business Forum, 2 February, Kawasaki, Japan.
- Mori, H., 2009. "Panel Discussion: Realising Low Carbon Cities – Opportunities and Challenges." At the International Symposium, Realising Low Carbon Cities: Bridging Science and Policy, 16 February, Nagoya, Japan, Organised by Nagoya University Graduate School of Environmental Studies, Global Carbon Project and National Institute for Environmental Studies.
- Nakamura, H., 2009. "International Co-operation of Cities in Climate Change Policy." In Session 5: Cities and Climate Change International Workshop, Towards Low Carbon Cities: Understanding and Analysing Urban Energy and Carbon, 18 February, Nagoya, Japan, Organised by Nagoya University Graduate School of Environmental Studies, Global Carbon Project and National Institute for Environmental Studies.
- Nakamura, H., 2009. "Potential of International Intercity Network for Low-Carbon Development in Asia." Paper presented at a session of the G4 Low Carbon Societies in Asia, ICLEI World Congress, 17 June, Edmonton, Canada.
- Nakamura, H., 2009. "Potential of international platform for sustainable city development in Asia." Paper presented at Northeast Asia Eco-Forum on Ecosystem Health and Regional Sustainable Development, 25 September, Shenyang, China.
- Nakamura, H., 2009. "Ajia kankyo toshikan nettowa-ku no genjo to hyoka (State and evaluation of Asian intercity network programme for the environment)." Presented at the 4<sup>th</sup> study meeting of politics. Research Unit of Network Analysis in Asia, Organisation for Asian Studies, Waseda University, 3 October, Tokyo, Japan.
- Mori, H., 2008. "Functions of International Intercity Network for Sustainable Development." Presented at the 4<sup>th</sup> Asia-Pacific Eco-Business Forum, 21 January, Kawasaki, Japan.
- Otsuka, T., 2008. "Platform for Regional and Global Environmental Network." Presented at the 4<sup>th</sup> international expert workshop for urban and industry symbiosis, 24 January, Tokyo, Japan.
- Nakamura, H., 2008. "Factors affecting Practice Diffusion through International Intercity Network Programme" Paper presented at the IGES international workshop on intercity network programmes, 17 December, Hayama, Japan.

## ***(2) Low-carbon development of Asian cities in developing countries through international intercity collaboration***

### ***Reports and book chapters***

- Nakamura, H. and M. Elder, Forthcoming. "Enabling factors promoting local initiatives for sustainable consumption in Asia: Potential roles of local governments," in Hironori Hamanaka, Akio Morishima, Hideyuki Mori and Peter King (Ed). Sustainable consumption and production in the Asia-Pacific region: Effective responses in a resource constrained world. Hayama: Institute for Global Environmental Strategies.
- Nakamura, H., Forthcoming. Recommendations for enhancing international co-operation for low-carbon development between Japanese cities and cities in Asian developing countries. Hayama: Institute for Global Environmental Strategies.
- Ishinabe, N., Forthcoming. "Gurin konyu pa-tona-shippu" ni yoru teitanso gata kiki jisedai jidousha fukyu senryaku no teian: nihon no mainasu 20% mokuho tassei to ajia deno teitanso gata hatten wo mezashite (Green Purchasing Partnership: City-to-city cooperation for low carbon development in Japan and Asia). Hayama: Institute for Global Environmental Strategies.

Ishinabe, N., Forthcoming. Analysis of city-to-city cooperation and international intercity networks. Hayama: Institute for Global Environmental Strategies.

Ishinabe, N., Forthcoming. "Toshikan nettowa-ku gaikan oyobi ajia no teitanso-gata hatten ni muketa toshikan nettowa-ku puroguramu no kousatsu (Overview of intercity network and study of intercity network programme towards Asian low-carbon development)" in K. Mori, S. Urata and K. Kurita (Ed.) Jichitai no kokusaika to higashi ajia nettowaku (Internationalisation of municipal governments and East Asian network. Research Unit of Network Analysis in Asia, Organisation for Asian Studies, Waseda University.

### ***Presentations***

Nakamura, H., 2010. "Potential of international intercity collaboration towards low-carbon development in Asia," in Workshop on Low-carbon City, Hosei University, 29 January, Tokyo, Japan.

Ishinabe, N., 2010. "International intercity network programme for low-carbon development in Asia," in Workshop on Low-carbon City, Hosei University, 29 January, Tokyo, Japan.

Nakamura, H., 2010. "Opportunities and feasibility of international intercity collaboration on low-carbon city development," in International workshop on local initiative towards low-carbon city in Asia, 24 February, Fukuoka, Japan.

Ishinabe, N., 2010. "Intercity network programme ideas for low carbon development in Asia." Paper presented at the 5<sup>th</sup> Kitakyushu Initiative Network Meeting, 10 February, Kitakyushu, Japan.

Nakamura, H., 2009. "Potential of international platform for sustainable city development in Asia," Northeast Asia Eco-Forum on Ecosystem Health and Regional Sustainable Development, 25 September, Shenyang, China.

Ishinabe, N., 2009. "International intercity network for low carbon development in Asia" in fifth study meeting of Network analysis study of Asian region project, at Waseda University Organisation for Asian Studies, 26 December, Tokyo, Japan.

### ***(3) Financial mechanisms that could facilitate urban/local initiatives on development and climate change mitigation***

#### ***Reports***

Nakamura, H., H. Mori and M. Elder, 2009. Carbon Finance for Low-Carbon Community Development in East Asia - Cases of the Philippines, Indonesia and China -. Hayama, Japan, Institute of Global Environmental Strategies.

Nakamura, H., H. Mori and M. Elder, 2009. Environmental Finance for Low-Carbon Development Projects at the Local Level in Asia. Hayama, Japan: Institute of Global Environmental Strategies.

CER Indonesia, 2008. Study on local actions in Asia contributing to climate change mitigation and alternative finance mechanism, country: Indonesia. Hayama, Japan: Institute for Global Environmental Strategies.

Klima, 2008. The study of financial mechanisms to support local actions contributing to climate change mitigation in the Philippines. Hayama, Japan: Institute for Global Environmental Strategies.

Sun, P., Z. Liu and Y. Qu, 2008. The study of financial mechanisms to support local actions contributing to climate change mitigation in China. Hayama, Japan: Institute for Global Environmental Strategies.

## ***Presentations***

Nakamura, H., 2009. "Financing Local Low-carbon Development Practices in Asia," at the workshop on financial mechanisms for low-carbon community development in Asia, 13 March, Tokyo, Japan.

### ***1.5. Self-evaluation***

#### ***1) Relevance***

The study on local initiatives focusing on the potential for international intercity collaboration was relevant because it drew lessons from different Asian intercity network programmes and others outside of Asia, and from bi-lateral intercity collaboration, and made an input to an actual network programme, i.e., the Asia-Pacific Eco-Business Forum. The study was appropriate because practical ideas are needed to extend intercity collaboration for Asian low-carbon development, which is advocated by the city of Kitakyushu, Japan. The study also responded to the issue of low-carbon development by examining the opportunities and constraints specific to low-carbon development and carbon finance to draw implications for local governments in Japan and other Asian countries.

#### ***2) Effectiveness***

The achievements are appropriate in relation to the specific study objectives for each component. The study provided several lessons learnt from the analysis of international intercity network programmes for the environment in Asia for effective utilisation of intercity networks, which resulted in the development of draft guidelines for an international platform for sustainable cities in consultation with UNEP IETC. The component that began in the final year of the Fourth Phase also produced preliminary outputs to assess the current state of international intercity collaboration for Asian low-carbon development and to propose possible programmes and activities that could be conducted with participation of Japanese local governments and those in Asian developing countries. The proposals are partly based on the study on carbon finance for low-carbon community development, which was conducted in the second year.

#### ***3) Efficiency***

Financial and human resources were effectively used. The study on promotion of urban/local initiatives for sustainable society was conducted by only one researcher for the first two years and four months and by only two researchers for the last eight months of the Fourth Phase, in collaboration with partner researchers and research institutes in Japan and other Asian countries. Relationships with partners were effectively coordinated. Fundraising was successfully performed to develop a new study project with partner institutes.

#### ***4) Outputs and Impact Created***

The study began to create channels to communicate study results and ideas with implementing bodies of intercity collaboration for sustainable development. The study on international intercity network programmes for the environment contributed to collate and disseminate the lessons learned regarding international intercity collaboration for sustainable development, including that of the Kitakyushu Initiative for a Clean Environment, for which IGES has served as secretariat, CITYNET,

ICLEI Southeast Asia, and UNEP IETC's Ecotown project, to relevant stakeholders of cities such as Kawasaki of Japan, Bandung of Indonesia, Penang of Malaysia, and Shenyang of China, through the Asia-Pacific Eco-Business Forum. The study on low-carbon development of Asian cities in developing countries through international intercity collaboration was just started in the last part of the Fourth Phase, yet it provided several assessments and proposals. The study also started to establish good relationships with several stakeholders to discuss the ideas of intercity collaboration and necessary supporting institutions. Such stakeholders include Japanese local governments such as Kitakyushu and Minamata, local governments of Asian developing countries such as Jakarta, Indonesia and Bangkok, Thailand, international networks such as CITYNET, and government agencies such as the Japan International Cooperation Agency.

## **1.6. Conclusion**

The study on international intercity network programmes for the environment that started in the first year and the study on environmental finance, in particular carbon finance, for sustainable local development that started in the second year, have evolved into a larger study on low-carbon cities and international collaboration. The current study will continue in the Fifth Phase in closer relationship with implementation of intercity collaboration for low-carbon development. Further development is expected especially for the study on low-carbon development of Asian cities in developing countries through international intercity collaboration.

## **2. Environmental Management in South and Northeast Asia**

### **2.1. Environmental Management in Northeast Asia (FY2007-2008)**

#### **2.1.1. Objectives**

The objectives of this Joint Research are to develop measures to improve overall environmental cooperation in Northeast Asia in general, and to make the Tripartite Environmental Ministers Meeting among China, Japan, and Korea (TEMM) in particular play a more important role in coordinating with other mechanisms in order to promote coherent, efficient and effective environmental management in Northeast Asia. The study includes three components: (i) identification of major environmental issues in Northeast Asia, (ii) review of existing regional environmental cooperation mechanisms, and (iii) proposal for enhancing environmental cooperation in Northeast Asia.

#### **2.1.2. Major Findings**

Five symptoms common to all selected environmental cooperation mechanisms are summarised as:

- Weak coordination of various activities within each environmental cooperation mechanism.
- Resources (in finance, human and in kind) available to existing environmental cooperation mechanisms are significantly lower than what is needed to address regional environmental issues effectively by each environmental cooperation against its stated mandates.
- There has been limited participation of stakeholders other than national governments in most existing environmental cooperation mechanisms.
- There have been no shared goals, principles or strategic action plan to implement systematic environmental cooperation in NEA.

- There is weak scientific evidence and assessment to accelerate the promotion of systematic environmental cooperation in this region.

General recommendations for overall environmental cooperation mechanisms in this region are:

- Develop goals and principles as basic guidelines for all parties and stakeholders involved to share and follow the same vision.
- Improve coordination among 1) existing mechanisms, 2) participating countries, with 3) international organisations, 4) existing global environmental regimes, 5) environmental mechanisms in other regions, and 6) other sectors.
- Improve financial strength by establishing strong partnerships and relationships with funding agencies as well as private corporations.
- Engage stakeholder participation by establishing a certain system to enforce the participation of social stakeholders, such as local governments, private corporations, civil society organisations, academic institutions, and so forth.
- Improve knowledge sharing by conducting comprehensive research programmes in both natural scientific fields and social scientific fields.

The specific recommendations for TEMM, including some suggested future activities are:

- Lay down the basic principles and objectives of TEMM.
- Consider establishing a secretariat in the future.
- Establish a subsidiary body for proposal-making and supervising implementation.
- Enlarge the geographic coverage of TEMM when necessary.
- Develop the NEA Environment Outlook to assess the current state of the environment in comprehensive ways to appropriately address policy measures at the regional level.
- Develop a pragmatic Action Plan including expected outcomes, outputs of the mechanism, projects to be implemented, other relevant activities, current situation of regional environmental cooperation, gaps against planned outputs, and the like.
- Organise NEA environmental week to strengthen networking and cooperation among countries and relevant organisations, donor agencies, and stakeholders in NEA.

### ***2.1.3. Impacts Created: Inputs into Major Policy Processes***

This project began as a joint research project of three research institutes from Japan, China, and the Republic of Korea, as proposed in the 6<sup>th</sup> Tripartite Environmental Ministers Meeting (TEMM). It was the first research project of this sort to assess the current status of environmental cooperation mechanisms in this region and make recommendations to further strengthen regional ties under this theme. The value of this research and its outputs were referred to at the TEMM in FY2008. Specifically, the summary of the Tripartite Joint Research on Environmental Management in Northeast Asia was presented at the 10th Pre-TEMM (Jeju, September 2008). The final draft and summary for policy makers of the Tripartite Joint Research on Environmental Management in Northeast Asia was presented at the 10th TEMM (Jeju, December 2008). The importance of collaborative research was mentioned in the TEMM's Joint Communiqué. The output of this joint project was included as part of the references for development of future TEMM proposals as presented by the Environment Minister of the Republic of Korea.

#### **2.1.4. List of Publications**

##### **(1) Reports**

Policy Research Center for Environment and Economy of the Ministry of Environmental Protection of China, IGES, Korea Environment Institute. 2009. Tripartite Joint Research on Environmental Management in Northeast Asia.

Policy Research Center for Environment and Economy of the Ministry of Environmental Protection of China, IGES, Korea Environment Institute. 2009. Tripartite Joint Research on Environmental Management in Northeast Asia – Summary for Policymakers (in English and Japanese).

IGES. 2009. Final Report of the Tripartite Joint Research on Environmental Management in Northeast Asia. Hayama, Japan: Institute of Global Environmental Strategies.

##### **(2) Presentations**

Ota, Eri, 2008. "Proposal for Enhancing Environmental Cooperation in Northeast Asia: Future sub-regional environmental cooperation and the NEASPEC." *Presentation at 13<sup>th</sup> Senior Officials Meeting of North East Asian Sub-Regional Programme for Environmental Cooperation (NEASPEC) meeting, 20-21 March 2008.* Ulaanbaatar, Mongolia.

#### **2.1.5. Self-evaluation**

##### **1) Relevance**

Regional environmental problems have incurred environmental management issues that straddle one or more borders, and may only be solved through cooperation between relevant countries. There are now in operation various regional environmental cooperation mechanisms (ECMs) and projects such as the Tripartite Environment Ministers Meeting (TEMM), the Northeast Asian Conference on Environmental Cooperation (NEAC), the North-East Asian Sub-regional Programme for Environmental Cooperation (NEASPEC), and the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP). The emergence of these ECMs is a positive sign that the region's countries have an active stance toward regional environmental cooperation. However, it has been frequently pointed out that unified coordination and management between cooperation mechanisms is lacking, and most have a weak financial basis. This insufficiency has caused not only confusion among government officials, researchers, and the public, but also overlaps and repetition of efforts, low efficiency of investment, and irregularities among the mechanisms. Thus the overall effectiveness of cooperation mechanisms may be compromised and the process of environmental protection and sustainable development in this region may be slowed down. These issues have become increasingly recognised by governments. Therefore, this study was commissioned by TEMM in order to address these issues and contribute to dialogue on how to better improve overall environmental cooperation in the NEA region.

##### **2) Effectiveness**

Coordinating research on such a politically sensitive topic among research institutes of the three countries was very challenging. Despite this and other challenges, the study was successfully completed and the report was finalised.

### **3 ) Efficiency**

Resources were used efficiently. If additional time and human resources had been available, this research could have been the basis for an additional policy report or policy brief to present material and perspectives that were not included in the joint report.

### **4) Outputs and Impact Created**

The value of this research and its outputs were referred to at the TEMM in FY2008. Specifically, the summary of the Tripartite Joint Research on Environmental Management in Northeast Asia was presented at the 10th Pre-TEMM (Jeju, September 2008). The final draft and summary for policy makers of the Tripartite Joint Research on Environmental Management in Northeast Asia was presented at the 10th TEMM (Jeju, December 2008). The importance of collaborative research was mentioned in the TEMM Joint Communiqué. The output of this joint project was included as part of the references for development of future TEMM proposals, as presented by the Environment Minister of the Republic of Korea.

#### **2.1.6. Conclusion**

This study was completed in FY2008. The study on transboundary air pollution was the follow up of this study. Moreover, in the 5th Phase, IGES has become more directly involved in supporting the TEMM process, for which this study provides important background.

## **2.2. Transboundary Air Pollution**

### **2.2.1. Objectives**

This study aims to identify issues and barriers for the introduction of an integrated approach to atmospheric environmental management in East Asia. In FY2009, the major components of the study were research on domestic atmospheric environmental management policy trends in case study countries (China, Japan, Korea, and Thailand), and comparisons and analyses of the European experience relating to domestic decisions to agree to common atmospheric environmental management policy.

### **2.2.2. Major Findings**

Overall, several domestic policy trends in the case study countries appear to be moving in the direction of a steady though gradual strengthening of air quality standards, regulation and administrative capacity. This is especially evident regarding increased emphasis on strengthened automobile emissions standards, energy conservation, and steady though gradual upgrading of environmental administration capabilities and coordination. For example, in all four case study countries, China, Japan, Korea, and Thailand, environmental administration has been upgraded to the ministry level. Also, all of these four countries have already included or are considering inclusion of air pollutants such as PM<sub>2.5</sub> and VOCs (such as benzene), which have recently received increased public attention, in the ambient air quality standards and substances to be monitored. So these trends may suggest some cautious optimism about the possibility of reaching an agreement on increased international or regional cooperation. Nevertheless, obstacles still remain such as

difficulties in enforcement, especially at the local level, continued need for upgraded administrative capacity, and complexity regarding the interrelationship between air pollution control and economic development and competitiveness.

In the past, prioritisation of economic growth and competitiveness has generally been an inhibiting factor for effective management of air quality in some case study countries, as overall air pollution levels have increased due to rapid economic growth, thereby offsetting steady progress in terms of strengthened policies and administrative capacity that has been achieved. However, it is notable that there are new developments in some of the case study countries which have created subtle changes in the relationship between environment and the economy. For China, important global events, especially sports events like the Olympics, have become economic and political priorities. Costly policy measures that harmed various industries, including the mandatory shutdown of factories without compensation, were employed to ensure an acceptably high level of air quality. Moreover, there are now efforts underway to apply these measures to other cities hosting large global events such as the Shanghai Expo and the Asian Games in Guangzhou. It is also interesting that increased public investment in scientific research, which can be considered utilisation of the revenue from economic activities, was important in developing the scientific and technological capacity to implement those costly policy measures. Thus, there is some evidence of a change in thinking in China about the appropriate relationship between economic growth and atmospheric environmental management. For Thailand, citizen protests against air pollution from petrochemical industries, combined with NGO activities and media attention, were followed by a court injunction which suspended work on national-level industrial development projects in the Map Ta Phut industrial estate. Therefore, Thailand may be starting to follow the trend of countries like Germany or Japan, where an increasingly active civil society played an important role in influencing policy makers to improve air quality. Although it is not appropriate to generalise from limited cases, these developments may be considered to show the possibility of the development of a new relationship between economic growth, economic competitiveness and air quality management in the region.

This study's analysis of European experiences has shown that there are some key domestic factors influencing decisions to agree to common policy, in this case the Convention on Long-Range Transboundary Air Pollution (CLRTAP). These factors especially influenced the negotiating position of individual countries, even though an overall desire to reach an agreement to promote détente in the Cold War was also a key motivating factor. For West European and Nordic countries, economic interests of key industries were a major factor in determining the negotiating positions of countries. Cost-benefit of abatement and effects on economic competitiveness were their primary concern, which heightened the importance of technological solutions to reduce abatement cost. While the role of ideas, such as scientific findings, was also important, influence was affected by domestic economic interests, so common understanding between scientists of different countries became a necessary enabling condition. Capacity of environmental regulatory institutions also contributed to the negotiating positions of countries. For some Eastern and Southern European countries, a key factor was the motivation to join the EU, based on economic (and also political) interests. For some countries, becoming a member of the EU was a key objective, and this provided strong incentive to meet EU environmental standards, thus reducing the obstacles to ratification of CLRTAP in these countries.

### ***2.2.3. Impacts Created: Inputs into Major Policy Processes***

Since this research project is still at an early stage, inputs into major policy processes are not yet

expected. Nevertheless, through research collaboration with researchers in case study countries, the project has started to contribute to their capacity building, which is important as these researchers are expected to be advising policy makers in those countries in future.

#### **2.2.4. List of Publications**

##### **(1) Reports and book chapters**

- IGES, 2009. Atmospheric Environment Management Policies in the Case Study Countries. Included in the FY2008 report to MOE compiled by Kanazawa University.
- Wang, Zifa and Xin Li, 2009. Air Quality Before, Under and After Olympic Regional Air Quality Modeling, Forecast and Control Policy for the Beijing Olympic Game 2008. Hayama, Japan: Institute for Global Environmental Strategies.
- Boonjawat, Jaria, 2009. Identifying the Issues and Barrier for the Introduction of Integrated Approach to Air Quality Management in Thailand. Hayama, Japan: Institute for Global Environmental Strategies.
- Zhou, Xin, Hideyuki Mori, et. al., 2008. Institutional Changes in Asia in Response to Climate Change. In Hironori Hamanaka, Akio Morishima, Hideyuki Mori, and Peter King, eds. Climate Change Policies in the Asia-Pacific: Re-uniting Climate Change and Sustainable Development. Hayama, Japan: Institute for Global Environmental Strategies.
- Wang, Mingyuan, "On the Law and Policy for Air Quality Supervision and Administration in China," February 2010.
- Wang, Zifa, "Report on Recent Trends Towards Regional Air Quality Management in China," February 2010.
- Dong-Young Kim, "Explaining Urban Air Pollution Policies for Mobile Emissions in South Korea (1991-2009), March 2010.
- Yoon, Esook, "Air Quality Management of South Korea," March 2010.
- Panich, Noppaporn, "The Study of Air Quality Management Policy of Thailand," March 2010.

##### **(2) Presentations**

International Expert Meeting on the Cooperative Framework for Comprehensive Management of Atmospheric Environment in East Asia, 20-21 January 2009, Institute for Global Environmental Strategies, Hayama, Japan.

- Mori, Hideyuki and Mark Elder. 2009. Research on Constraints and Problems in East Asian Countries for Comprehensive Management of Atmospheric Environment: Research Framework.
- Miyajiri, Hiromitsu. 2009. Research on Constraints and Problems in East Asian Countries for Comprehensive Management of Atmospheric Environment: Country Case Studies.
- Wang, Zifa and Xin Li. 2009. Air Quality Before, Under and After Olympic Regional Air Quality Modeling, Forecast and Control Policy for the Beijing Olympic Game 2008.
- Boonjawat, Jaria. 2009. Identifying the Issues and Barrier for the Introduction of Integrated Approach to Air Quality Management in East Asia: Thailand Case Study.

International Expert Meeting on the Cooperative Framework for Comprehensive Management of Atmospheric Environment in East Asia, 3-4 March 2009, Kanazawa University, Kanazawa, Japan.

- Miyajiri, Hiromitsu. 2009. Research on Constraints and Problems in East Asian Countries for

Comprehensive Management of Atmospheric Environment: Country Case Studies.

- Elder, Mark. 2009. Research on Constraints and Problems in East Asian Countries for Comprehensive Management of Atmospheric Environment: Using a Political Science Approach to Analyse Domestic Level Constraints and Problems.

2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change, 2-4 December, Hotel Volendam, Katwoude, Netherlands

- Elder, Mark, 2009. Domestic Policymaking Processes and Architecture for Earth System Governance: From Theory to Practical Implications.

International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.

- Kim, Dong-Young, "Explaining Urban Air Pollution Policies in Korea (1991-2009)." At the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.
- Yoon, Esook, "Politics of Air Quality Management: Korea." At the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.
- Elder, Mark, "S7 Theme 3 Subtheme 2: Research Results." At the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.
- Wang, Mingyuan, "Research on the Policies of Administration of Air Quality in China." At the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.
- Matsumoto, Naoko, "Case Study on Japan: Japan's Domestic Policy Process towards Regional Cooperation on Air Quality Management." At the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.
- Panich, Noppaporn, "The Study of Air Quality Management Policy of Thailand." In the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.
- Wang, Zifa, "Report on Recent Trends Towards Regional Air Quality Management in China." In the International Experts Workshop on International Framework and Cobenefit Approach to Promote Air Pollution Control Countermeasures in East Asia, 23-24 January 2010, Hayama, Japan.

### **2.2.5. Self evaluation**

#### **1) Relevance**

Air pollution remains a serious problem in East Asia, and in recent years, the region has seen increased emissions of air pollutants such as SO<sub>x</sub>, NO<sub>x</sub>, VOCs, ozone, particulates, and GHG gases such as CO<sub>2</sub>. This results from the rise in energy demand due to rapid economic development and increased consumption of fossil fuels. It is expected that these emissions will further increase due to

continued economic development. Air pollution has also become a regional transboundary problem. Therefore, it is increasingly recognised that air pollution can no longer be addressed as a local or even as a national issue, and that international cooperation is necessary. Nevertheless, international cooperation still requires actions at the national level. However, there is not yet a regional agreement in Northeast Asia. Moreover, in the past decade, transboundary air pollution has expanded to include new issues such as ozone/aerosol and climate change, in addition to the traditional issue of acid deposition. To promote further development of collaboration in transboundary air pollution issues in East Asia, there is need for additional research from both the natural science and social science perspectives on remaining and newly emerging issues, since information and analyses on many aspects are still insufficient, and progress in Asia lags behind Europe. It is expected that this research project will contribute to the fostering of increased international cooperation regarding atmospheric environmental management in East Asia.

## **2) Effectiveness**

Research was effectively conducted. Effective coordination was performed with partner research institutes, including completion of their reports, and country studies made significant progress. The International Experts' Workshop was successfully held, and a presentation was made at the 2009 Amsterdam Conference on the Human Dimensions of Global Environmental Change.

## **3) Efficiency**

Resources were used efficiently.

## **4) Outputs and Impact Created**

This study is expected to contribute to a strategy to promote future international negotiations to improve air quality management in East Asia, including the possibility of a future international framework. Research results are expected to be input into a prospective future forum on co-benefits in Asia. The project attempts to foster capacity development regarding studies of air quality management from a policy perspective in case study countries, with a view towards establishing a regional research network.

### **2.2.6. Conclusion**

This is the first year of a five-year study funded by the Global Environment Research Fund of the Ministry of Environment of Japan (S-7), so work is still in the beginning phase.

## **2.3. RISPO-II (Outreach activities in FY2007)**

### **2.3.1. Objectives**

RISPO-II (Research on Innovative and Strategic Policy Options Phase II) was conducted from FY2005 through FY2007 with the objective of providing policymakers with strategic environmental policy options for promoting sustainable development in the context of regional economic integration and identifying strategies for environmental sustainability and poverty reduction. In FY2008,

outreach activities were carried out to disseminate the results and findings of the study and develop further research activities.

### **2.3.2. Major Findings**

Economic gains from further regional economic integration are expected to be mostly positive, but negative environmental impacts will be aggravated in many cases. Moreover, due to forecasted massive increases in economic growth, emissions of all environmental pollutants will drastically increase regardless of regional economic integration. Case study analysis shows that further economic integration will likely magnify both environmental problems, such as illegal waste trade and dumping, and environmental opportunities, such as trade in environmental goods and services. Economic integration sometimes causes difficulties for domestic policies such as recycling and renewable energy promotion. Opportunities of economic integration include increased recycling efficiency through waste trade, increased trade of environmental goods and services like organic agriculture or renewable energy equipment, and technology transfer.

Economy-wide analysis found that policies such as strengthened energy efficiency standards, emissions trading, carbon tax, and financial assistance to developing countries, could be effective in reducing negative environmental impacts with modest costs to GDP, and that emissions trading may be more effective than a carbon tax. Case study analysis emphasised the importance of combining enhanced regional coordination with national capacity building. Examples of regional coordination measures include: coordinated increases in renewable energy targets, technology transfer and financial assistance, harmonised eco-labelling for organic agriculture, international recycling zones linking eco-industrial parks, and regionally coordinated EPR, information sharing, and certification of recyclers.

This research concludes that there is considerable scope for synergies between policies that promote the multiple goals of economic development, environmental protection, and poverty reduction. Economic integration makes it more difficult to address environmental issues through national policies alone, so more concrete regional cooperation mechanisms, either formal or informal, are also necessary. At the same time, national capacity building is still very important, especially in developing countries.

### **2.3.3. Impacts Created: Inputs into Major Policy Processes**

The research results were presented at various conferences supported by policy-related international organisations, including the First Meeting of Network Institutions for Sustainable Development in Asia organised by the UNEP/ETB and Korea Environment Institute, and other meetings organised by the OECD, UNEP, and the International Federation of Organic Agriculture Movements (IFOAM). Some of the recommendations from the waste studies under RISPO-II were reflected in the original planning of the Regional 3R Forum in Asia.

### **2.3.4. List of Publications**

#### **(1) Peer-reviewed**

Romero, J., M. Elder and A. Bhattacharya, 2009. "Strengthening ASEAN+3 renewable energy

strategies,” *International Energy Journal*.

Sano, D. and S.V.R.K. Prabhakar, 2009. “Some policy suggestions for promoting organic agriculture in Asia.” *The Journal of Sustainable Agriculture* 34(1).

Hotta, Y., M. Elder, H. Mori, and M. Tanaka, 2008. “Policy Considerations for Establishing an Environmentally Sound Regional Material Flow in East Asia.” *Journal of Environment and Development*. 17(1) March.

## **(2) Book**

Kakali, M., and P. Thomassin, 2009. *Economic and Environmental Impact of Free Trade in East and South East Asia*. New York: Springer.

## **(3) Reports**

IGES. 2008. 平成19年度アジア太平洋地域における革新的戦略オプション研究業務報告書 (RISPO-II Final report submitted to the Ministry of the Environment).

Hotta, Y. and Elder, M. (2009), “Internationalisation of Waste and Recycling Related Issues and Its Implications for EPR-based Recycling Policy”. In *Extended Producer Responsibility Policy in East Asia – in Consideration of International Resource Circulation*, 115-130. Hayama: Institute for Global Environmental Strategies.

## **(4) Non-peer reviewed**

Hotta, Y. and Kojima, S., 2008. “Estimation of Environmental Impacts of Regional Economic Integration in East Asia: Implications for Waste and Recycling Policy”. IGES WMR Working Paper Series, Hayama: IGES.

## **(5) Selected presentations**

Hotta, Y., Hayashi, S., Aoki, C., and Bengtsson, M., “Extended Producer Responsibility (EPR) Policy in East Asia in consideration of International Resource Circulation”. Presented at the 5th International Conference on Industrial Ecology "Transition Towards Sustainability", 21-24 June 2009, Lisbon, Portugal.

Bhattacharya, Anindya, Tuyet, N., and Elder, M. An Assessment of Vietnam's Renewable Energy Policy. In *Energy Security and Climate Change: Issues, Strategies, and Options (ESCC 2008)*, 6-8 Aug. 2008, Bangkok.

Bhattacharya, Anindya, Elder, M. and Romero, J. Least Cost Portfolio based RPS Target: A Cost Competitive Approach for Japanese Renewable Energy Promotion. In *Annual Meeting of the International Energy Workshop*. Paris, June 2008.

Bhattacharya, Anindya. IGES Initiatives and Scope of Possible Collaboration with OECD, OECD Paris, July 2008.

Bhattacharya, Anindya. A Case Study on Energy Sector in the ASEAN+3 Region. In the *Joint UNEP and Statistics Sweden Expert Meeting on Energy Subsidies*. Geneva, May 2008.

IGES. Results of the RISPO-II research. Presented at the *First Meeting of Network Institutions for Sustainable Development in Asia* organised by the Korea Environment Institute and UNEP/ETB, Seoul, the Republic of Korea, July 2008.

Hotta, Y. and Elder, M., “Strategic options for sound material cycle society in Asia”. *OECD-UNEP Conference on Resource Efficiency*, 23-25 April 2008. Paris.

- Kojima, Satoshi. Social, Economic, and Environmental Impact Assessment of Environmental Policies under Regional Economic Integration. In the Annual Conference of the Society for Environmental Economics and Policy Studies (SEEPS). Osaka, September 2008.
- Romero, Jane, M. Elder, and A. Bhattacharya. Scaling up renewable energy projects in East Asia. In Energy Security and Climate Change: Issues, Strategies, and Options (ESCC 2008), Bangkok, 6-8 Aug. 2008.
- Sano, Daisuke, M. Elder, and S.V.R.K. Prabhakar. Environmental Impacts of Economic Integration on Asian Agriculture: Policy Options, Challenges and Opportunities for Organic Agriculture. In 16th IFOAM Organic World Congress, Government Support Policy Module. Modena, Italy, June 2008.
- Elder, M. "Contributing to Environmental Objectives through RTAs: Trade in Organic Agricultural Products and Renewable Energy Technologies." Presented at OECD Workshop on Regional Trade Agreements and the Environment. United Nations University, Tokyo, 19-20 June 2007.
- Kojima, S. and Bhattacharya, A. 2007. "Environment Impact Assessment of Future Regional Economic Integration in East Asia." Proceedings of International Symposium of Eco Topia Science 2007, ISETS07, Japan.
- Elder, M., Battacharya, A. and J. Romero. "Economic Integration and Renewable Energy in East Asia: Policy Implications." For presentation and inclusion in the Proceedings of the World Renewable Energy Regional Congress & Exhibition II, 5-7 November 2007, Jakarta, Indonesia.
- Elder, M., Battacharya, A. and J. Romero. "The Puzzle of Japanese Renewable Energy Policy: Why Japan is Lagging and How it Can Catch Up." For presentation and inclusion in the Proceedings of the World Renewable Energy Regional Congress & Exhibition II, 5-7 November 2007, Jakarta, Indonesia.
- Hotta, Y., Elder, M., and H. Mori. "International Flow of Recyclable Materials and the Prospects for an Asian Regional Recycling Network." Presented at the Fourth International Conference of the International Society for Industrial Ecology, University of Toronto, Toronto Canada, 17-20 June 2007.

### **2.3.5. Self-evaluation**

#### **1) Relevance**

The Asia-Pacific region is one of the world's fastest growing trading regions. In the last decade the region has experienced a boom in regional and bilateral Free Trade Agreements (FTAs) and Economic Partnership Agreements (EPAs). This process may eventually culminate in the creation of an East-Asian community. The regional economic integration process will likely have significant implications for the environment and sustainable development. Policy choices will significantly influence the extent to which these implications are positive or negative. Therefore, the overall objective of RISPO-II was to develop appropriate policy recommendations that can both mitigate the negative impacts and enhance the positive impacts of regional economic integration in the region.

#### **2) Effectiveness**

This project faced many difficult challenges, including a change in the MOEJ contract procedure which resulted in work being stopped for about nine months out of its three-year timeframe. In addition, this project experienced significant personnel turnover and challenges in working with partner institutes. Despite these challenges, this study was effectively completed. In the year after RISPO-II officially ended, a peer-reviewed workshop was organised and held, and the project was highly evaluated.

### **3) Efficiency**

Despite a variety of significant challenges, including a nine-month interruption due to a change in MOEJ contract procedures, personnel turnover, and challenges in working with partner institutes, the project was brought to a successful conclusion. So overall, in the end, resources were used quite efficiently. Several outreach activities were also undertaken and publications were made based on a limited additional budget, and therefore these were also implemented in an efficient manner. Despite the considerable achievements of the project under difficult circumstances, there are a fair amount of valuable research results remaining that could have been published and input into various policy processes if additional time and human resources could have been made available.

### **4) Outputs and Impact Created**

The research results were presented at various conferences supported by policy-related international organisations including the First Meeting of Network Institutions for Sustainable Development in Asia organised by the UNEP/ETB and Korea Environment Institute, and other meetings organised by the OECD, UNEP, and the International Federation of Organic Agriculture Movements (IFOAM). Some of the recommendations from the waste studies under RISPO-II were reflected in the original planning of the Regional 3R Forum in Asia. Three peer-reviewed journal articles were published. Results from the agriculture, energy, and modeling components contributed to three chapters in the Third IGES White Paper, and a policy brief on renewable energy.

#### **2.3.6. Conclusion**

A number of IGES research activities followed up on and branched out from the work of the RISPO-II research, including the Biofuels Project, the WMR project research and activities relating to e-waste and 3Rs, and the research of the Economic Analysis team in general. Some of the Governance and Capacity Group's research in the 5<sup>th</sup> Phase may also draw on the RISPO-II research. Overall, the importance of this topic is likely to increase in the future.

## **3. Mainstreaming Transport Co-benefits Approach**

### **3.1. Objectives**

The study aims to promote the co-benefits approach, which merges local transport and global climate issues, in the planning and assessment of transport policies and projects. This project was conducted in collaboration with the Climate Change Area Market Mechanism Project.

### **3.2. Major Findings**

#### **(1) Awareness building of transport co-benefits**

Recognising that it is strategic and cost-effective to implement sustainable transportation policies that can address both local transport needs and global climate problems, it is important to promote greater awareness among policymakers and practitioners, both in the fields of transport and climate, on the transport co-benefits approach in assessing policies and projects.

The study analysed the dismal performance of the transport sector in the current CDM framework and called for reforms in the CDM and/or looking into the possibility of coming up with a new mechanism for Transport and Climate Change for post-2012. On one hand, it is envisioned that the new mechanism will be specific to the transport sector based on a programmatic approach or NAMAs considering co-benefits (air quality improvement, health improvement, and other social and economic benefits) as well as incorporate climate change issues in urban transport policies. On the other hand, it is necessary to sustain interest in the potential of CDM funding under the current framework in spite of only two registered projects to date. Participation in important climate and transport policy processes can advance the discussions in mainstreaming a transport co-benefits approach.

## ***(2) Quantifying transport co-benefits***

While the co-benefits approach is becoming widely accepted as a possible methodology to measure, report and verify (MRV) transport NAMAs, the discussions are stalled on how to quantify transport co-benefits. This study is developing a Transport Co-benefits Manual (TCM) which includes simplified guidelines and examples on how to quantify co-benefits (air quality improvement, health improvement, and other social and economic benefits).

Quantification of co-benefits is a data intensive process. Considering the lack of updated data in developing countries in Asia, the TCM will provide default values or a range of values based on estimation from secondary data of previous studies to represent actual conditions best fitting the respective co-benefit. An expert consultation will be held to assess the robustness of the methodologies and to seek consensus in examining the proposed default values of some variables. Further validation of methodologies will be done with empirical data from proposed and existing transport projects in Thailand and the Philippines.

### ***3.3. Impacts Created: Inputs into Major Policy Processes***

As member of the Partnership on Sustainable, Low Carbon Transport (SLoCaT) and the Bridging the Gap Initiative, our work on co-benefits was recognised in drafting the Bellagio Declaration on Transportation and Climate Change stating that (1) effective climate action is incomplete without addressing the overall system performance of the transport sector, (2) climate action in the transport sector should recognise co-benefits, and (3) more effective carbon finance mechanisms and associated procedures should catalyse transport policies, programmes and projects. The Partnership also lobbied for the inclusion of transport in the COP15 negotiations, as well as hosted a series of side and parallel events on transport and climate.

### ***3.4. List of Publications***

#### ***Book Chapter***

Sutomo, Heru, Romero, Jane and Eric Zusman. The co-benefits of Jakarta's BRT: getting the institutions right. In *Low carbon Transport in Asia: Strategies for Optimising Co-benefits*. Forthcoming.

## ***Selected Presentation***

Romero, Jane, E. Zusman, A. Fukuda, H. Morisugi. 2009. Co-benefits of sustainable transport projects. In *Changing Course: Building a Low Carbon, Climate Resilient Transport Sector*, Copenhagen, Denmark, December.

### ***3.5. Self-evaluation***

The study, albeit just a small component, helped in re-establishing IGES's interest and capability in handling transport related research, complementing the study on the co-benefits approach done by the Climate Change Group. A detailed assessment following the criteria on relevance, effectiveness, and efficiency is given below.

#### ***1) Relevance***

The focus on the transport sector in this study highlighted the IGES mandate to conduct pragmatic and innovative research to support sustainable development in the Asia-Pacific. Transport is a major driver towards the economic development aspired by most developing countries in the Asia-Pacific, but the same sector is also a continuing large emitter of CO<sub>2</sub>. By mainstreaming the transport co-benefits approach, the study showed the possibilities of sustaining development through low carbon transport alternatives.

#### ***2) Effectiveness***

Despite the limited time and other resources to conduct this study, effective collaboration and partnership within IGES and like-minded institutions facilitated its smooth implementation. We conducted data gathering simultaneously with awareness generation through presentations and informal dialogues in relevant forums. In the process, our on-the-ground experiences combined together with the theoretical assumptions considered by our partners to produce the Transport Co-benefits Manual.

#### ***3) Efficiency***

This study utilised its limited resources in an efficient manner to deliver tangible outputs, particularly considering that this component was just an afterthought and not actually included in the 4<sup>th</sup> phase projects of the Policy and Governance Group. Our collaboration with established and recognised experts hastened our progress and guided our research direction. It also gave us credence to participate in high-level discussions relating to transport and climate change.

#### ***4) Outputs and Impacts Created***

The study was instrumental in bringing more attention to the transport sector in climate change talks. It helped enlighten climate change experts, as well as transport experts, on the broad issues and complementing alternatives available in providing both transport and climate change solutions. The transport co-benefits approach has the potential to address the concerns of growing and developing countries especially in the Asia Pacific to meet their developmental aspirations without

exacerbating environmental conditions. The study also has drawn the attention of policymakers and encouraged them to consider how they can improve their assessment in prioritising transport policies and projects.

### **3.6. Conclusion**

This study was one important example of cross-project collaboration within IGES to effectively utilise in-house expertise. It was also successful in drawing active collaboration from like-minded institutions to generate more impact, albeit having limited resources. This study will continue in the 5<sup>th</sup> Phase to be implemented by the Climate Change Group.

# Kitakyushu Office

## 1. Kitakyushu Initiative for a Clean Environment, Kitakyushu Office

### 2. Objective

The prime objective of the Kitakyushu Initiative (KI) programme is assisting the member cities in improving the urban environment through utilising the inter-city network for 1) facilitating information exchange on good practices among member cities, central government agencies, international and national organisations, external supporting agencies, NGOs, community groups, private companies and research organisations, through organising workshops and seminars; and 2) assisting replication of good practices in coordination with cities and these organisations.

### 3. Major Activities

#### ■ *FY2007 (1 researcher and 1 coordinator):*

Both the researcher and coordinator of the Kitakyushu Office became new persons from FY2007. After the 4<sup>th</sup> KI Network Meeting held in Kitakyushu in June 2007, they visited 11 member cities in six countries, namely San Fernando, Cebu, Bago and Puerto Princesa, the Philippines; Bangkok and Nonthaburi, Thailand; Surabaya and Bogor, Indonesia; Dhaka, Bangladesh; Weihai, China; and Ulsan, Republic of Korea, to confirm good environmental practices in each city and identify remaining environmental challenges and areas requiring external support. Through this baseline research, one outstanding project in Surabaya, on community-based solid waste management practices, was identified among others as a replicable model for other member cities through the inter-city network function, and it was intensively promoted in following years.

#### ■ *FY2008 (1 researcher and 1 coordinator; 1 visiting researcher from August):*

A total of six workshops and trainings were held in three countries to disseminate and assist replication of Surabaya's waste management model, particularly the efficient composting practices, as well as other environmentally good practices, as follows:

**Table 1 Workshops and trainings held in FY2008**

Month	City	Contents	Supported by
April 2008	Bago, Philippines	Workshop on solid waste management	Bago City, ESCAP
April – May	Bago, Bacolod and Cebu, Philippines	Workshop and hands-on training on composting	Bago City, Bacolod City, Cebu City, APFED <sup>*1</sup>
August	Surabaya, Indonesia	Workshop on community-based solid waste management, applicability of CDM for composting projects, improvement of final disposal sites, and internal resource utilisation for environmental management	Surabaya City, National Development Planning Agency (BAPPENAS), Ministry of Environment (KLH), Ministry of Public Works (PU), Kitakyushu City
November	Cebu, Philippines	Workshop and hands-on training on composting	Cebu City, Kitakyushu City
November	Bangkok, Thailand	Workshop on solid waste management and hands-on composting training	Bangkok Metropolitan Authority (BMA), Kitakyushu City
March 2009	Bangkok, Thailand	Workshop on solid waste management and hands-on composting training	BMA, ESCAP, DEE <sup>*2</sup> , Kitakyushu City

\*1 Asia-Pacific Forum for Environment and Development

\*2 Development of Environment and Energy Foundation, an NGO specialised in urban environment and energy management in Thailand

Concurrently, various research was carried out to identify good practices and analyse their success factors and impacts, and also to provide input into workshops and future events as follows:

**Table 2 Research conducted in FY2008**

Country	Contents	Supported by
Indonesia	Surabaya's solid waste management model and its replication in other cities in Indonesia	Kitakyushu City (IGES)
Indonesia	3R-related activities and publications in Indonesia	Ministry of the Environment, Japan (IGES)
Philippines	Good practices in municipal solid waste management, improvement of open dumping sites, and construction of low-cost sanitary landfills in the Philippines	ESCAP, Kitakyushu City
Indonesia	Low-cost decentralised wastewater treatment systems in Indonesia	ESCAP, Kitakyushu City
Philippines	Low-cost decentralised wastewater treatment systems in the Philippines	ESCAP, Kitakyushu City
Thailand	Low-cost decentralised wastewater treatment systems in Thailand	Kitakyushu City (IGES)

■ **FY2009 (1 researcher and 2 visiting researchers; 1 visiting researcher from December):**

Subsequently, similar activities including promotion of composting practices were continued to develop valuable inputs for the 5<sup>th</sup> KI Network Meeting in February 2010 and the KI Final Report as follows:

**Table 3 Main activities in FY2009**

Month	City	Contents	Supported by
May 2009	Bago and Talisay, Philippines	Workshop on municipal solid waste management and improvement of final disposal sites	Bago City, Talisay City, Negros Occidental Provincial Government, APFED, ESCAP
November	Surabaya, Indonesia	Workshop-training on composting and municipal solid waste management	Surabaya City, Ministry of Environment (KLH), Ministry of Public Works (PU), JICA Indonesia Office, Kitakyushu City, KITA
December	Sibu and Kuala Lumpur, Malaysia	workshop-training on composting	Sibu Municipality, Sarawak State Government, National Solid Waste Management Corporation, JICA Malaysia Office, Kitakyushu City
February 2010	Kitakyushu, Japan	5 <sup>th</sup> KI Network Meeting	Kitakyushu City, ESCAP, Ministry of the Environment, Ministry of Foreign Affairs, Japan

Concurrently, the Kitakyushu Office undertook the secretariat work for organising a High Level Seminar on Environmentally Sustainable Cities (HLS ESC) in March 2010 in Jakarta, Indonesia, under the framework of the East Asia Summit (EAS) Environment Ministers Meeting (EMM). The office conducted various work, including organising several committees as given in the following table, contacting and communicating with relevant persons, and designing and managing the seminar.

**Table 4 Events related to the High Level Seminar on Environmentally Sustainable Cities**

Month	Venue	Contents
October 2009	Singapore	1 <sup>st</sup> Organising Committee of High Level Seminar (HLS)
November	Tele-conference	Meeting of the four organising countries
February 2010	Kitakyushu, Japan	2 <sup>nd</sup> Organising Committee of HLS
March	Jakarta, Indonesia	3 <sup>rd</sup> Organising Committee of HLS HLS on Environmentally Sustainable Cities (ESC)

In addition to the above, Kitakyushu Office also undertook the advisory and monitoring work of the water supply and sanitation sector of the Indonesia Climate Change Programme Loan since 2008 and has conducted periodic on-site research in Indonesia, including work in November 2008, January, March and October, 2009 and January 2010, which resulted in field research reports and practical proposals for improving the sector.

#### 4. Impacts Created: Inputs into Major Policy Processes

As a result of a series of intensive trainings and workshops organised under the KI programme, Surabaya's solid waste management model has been replicated in several cities, starting from Bago and Cebu in the Philippines and Bangkok in Thailand, where model projects were developed. Subsequently, it was further replicated in other cities, namely Talisay, Cavite and Puerto Princesa in the Philippines, San Kamphaeng and Sri Lacha in Thailand, Sibul and Kuala Lumpur in Malaysia, and Lalitpur in Nepal, through various means of information exchange. Remarkably, a project proposal to replicate the same in five cities in Indonesia submitted jointly by the KI programme (IGES) and Kitakyushu City to the Indonesian Government was adopted as a JICA project called the PESAMAS (community-based solid waste management) Programme in January 2009, which is currently being implemented in cooperation with the Ministry of Environment and Ministry of Public Works.

Through these actual activities, a city-to-city replication model facilitated by an inter-city network programme, as well as other similar models intermediated by other organisations, including NGOs, government agencies, and external organisations, were identified, which have the potential to be adopted by other inter-city networks and organisations that work to disseminate good practices effectively.

#### 5. List of Publications

##### ***Kitakyushu Initiative Reports:***

IGES, *4th Kitakyushu Initiative Network Meeting, Proceedings*, June 2007

IGES, *Waste Reduction Programme through the Promotion of Organic Waste Composting by KitaQ System: Information Kit*, February 2009

Maeda, Toshizo, *Reducing waste through the promotion of composting and active involvement of various stakeholders: Replication of Surabaya's solid waste management model*, IGES/ Kitakyushu Initiative Policy Brief #1, December 2009

IGES, *5th Kitakyushu Initiative Network Meeting, Proceedings*, February 2010

IGES, *Kitakyushu Initiative Final Report*, February 2010

IGES, *Kitakyushu Initiative: Results of Commitment Report*, February 2010

IGES, *KI Newsletter No.4-8, 2008-2010*

##### ***Research Reports:***

Wahyuningsih, Prapti, and IGES, *Research on Community-based Waste Management Practices in Surabaya and Other Cities in Indonesia*, September 2008

Kitakyushu City and IGES, *Proposal on a Community-based Waste Management (PESAMAS) Programme in Indonesia - Replicating a Successful Model of Surabaya*, October 2008

IGES, *Baseline Study for PESAMAS (Community-based Waste Management through Composting) in Central Jakarta, Palembang, Balikpapan, Tarakan and Makassar*, March 2009

Wahyuningsih, Prapti, and IGES, *Research on Past 3R-related Activities and Modules in Indonesia*, March 2009

Ramirez, Ninette and IGES, *Research on low-cost wastewater treatment systems in the Philippines*, March 2009

Sujaritpong, Sarunya; Nitivattananon, Vilas and IGES, *Research on low-cost wastewater treatment systems in Thailand*, March 2009

IGES, *Solid waste management project report in Bangkok, Thailand*, March 2009

Todooc, Jessie and IGES, *Research on community-based solid waste management and landfill management in the Philippines*, June 2009

## 6. Self-evaluation

### 1) *Relevance*

General observation of the KI programme in 2007 when the new team started operation was that replication and scaling up of good practices were not demonstrated very well, although collection of such practices was performed well through organising a number of seminars and network meetings, and implementing a dozen demonstration projects. Therefore, the team started to develop an implementation strategy in order to deliver tangible results within three years by the closing of the programme in 2010, through visiting member cities and actually learning about good practices and remaining environmental challenges on-site.

During that period, the efficient solid waste management model in Surabaya was identified as a replicable model in other cities, since the prime environmental concern in many cities in developing countries is solid waste management, and as it was implemented with little budget (low-cost), using simple methods (low-tech), and efficiently utilising local resources. The model was intensively promoted from the following year.

The operation started with baseline research on success factors and a workshop held in Surabaya to disseminate the findings. Government officials in charge of solid waste management in the National Development Planning Agency (BAPPENAS), Ministry of Environment (KLH) and Ministry of Public Works (PU), as well as representatives from cities and municipalities around Surabaya and cities with good reputations in environmental management were invited per recommendations of the officials of Surabaya City and relevant persons. As a result, many participating cities expressed interest in implementing similar projects, and model projects were developed in five cities, which are currently implemented with support from the central government and the JICA Indonesia Office.

Similar approaches were adopted in Bago, Philippines, and Bangkok, Thailand, and many similar projects were replicated in other cities from there. The difference between these and Surabaya was that these projects were started up from the scratch and were developed into model projects through intensive input of human resources and follow-up activities. In fact, staff, as well as an expert, was dispatched four to five times over a short time period to apply pressure on these cities in a positive sense, motivate the counterpart officers, and resolve troubles before they get serious. The developed model projects were demonstrated to city officers, as well as to visitors from other cities. Composting trainings were organised, which further improved the awareness and motivation of the counterpart officers and resulted in more and more visitors to these model projects as well as invitations for them to demonstrate the same in other cities.

In this way, a rational strategy was adopted in operating an inter-city network programme in order to deliver expected outputs, and tangible environmental improvement in member cities, within a limited timeframe, starting from analysis of resources, including budget, human resources, skills, personal networks, and available good practices in cities, and intensive use of them. During the process, not only the scope and targeted subjects of the project, but also targeted cities and partners, as well as potential cities for replication of the project, were screened and selected, and cooperation with other supporting partners, including provincial and central governments and

supporting organisations, was developed. By adopting these approaches and requesting host cities and participants to share the cost, the programme has successfully invited more than 1,000 participants from over 100 cities to the KI workshops since 2008 in spite of a limited budget.

## **2) Effectiveness**

In terms of effective implementation of an inter-city network programme, it was fortunate for the network secretariat to find a useful case study, the replicable solid waste management model in Surabaya, as many cities in developing countries face similar waste problems. In order to develop the second and third pillars of the programme following the efficient solid waste management model, baseline research and analysis on success factors of other subjects, including low-cost decentralised wastewater treatment systems, improvement of final disposal sites, applicability of CDM for composting projects, and environmental management models with community participation, were carried out. However, due to the constraints of time and human resources, these findings were only shared and did not bring about actual replication, which is a remaining task of the programme.

With regard to the effective management of the programme, synergies with other IGES projects can be highlighted. For instance, the model project developed in Bago, Philippines, was an APFED Showcase Project, and intensive follow-up was enabled due to sufficient funding. The final workshop in Bago was also organised by the city using the allocated APFED budget. Monitoring of another APFED Showcase Project in Gianyar, Indonesia, on a CDM-registered centralised composting system, was also beneficial for the programme in terms of promoting composting projects and learning CDM applicability. Monitoring of another APFED Showcase Project in Sto Tomas, Philippines, on municipal solid waste management was also useful to learn a different management model and its replication in many other cities.

Undertaking the advisory and monitoring works of the water supply and sanitation sector of the Indonesia Climate Change Programme Loan was also useful for the programme in terms of building networks with relevant officers in the central government and learning ongoing and planned activities in these fields. As an actual output, an officer in charge of sanitation in the Ministry of Public Works was invited as a resource person to the 5<sup>th</sup> KI Network Meeting. Undertaking the secretariat work of organising and managing the High Level Seminar on Environmentally Sustainable Cities (ESC HLS) was also beneficial for the programme in terms of networking with relevant officers in various countries and organisations and utilising experiences accumulated by managing the KI programme.

Not only the synergies with other programmes and organisations but also effective resource mobilisation and utilisation were a remarkable feature of the programme, which include those of Kitakyushu City, ESCAP and APFED, as well as JICA Grassroots Grants and country offices. Requesting cost sharing to cities willing to host workshops was also an effective approach to improve the motivation of these cities.

## **3) Efficiency**

Cooperation and coordination with other organisations was an outstanding feature of the programme in terms of its efficient management. Collaboration with Kitakyushu City, KITA and JICA in each country to assist in implementation of composting projects led to the adoption of a component of a Solid Waste Management Course under the JICA Training Programme at JICA

Kyushu and allocation of seats for some cities where composting projects were implemented, and also became a pre-training course option for Japan Overseas Cooperation Volunteers. Coordination and building good relationships with government officers in Indonesia, including the Ministry of Environment, Ministry of Public Works and National Development Planning Agency, were valuable assets for the programme. Establishment of good relationships with USAID, GTZ, CITYNET, CAI-Asia and ICLEI was sought through attending each others' events and new collaborative relationships were developed with the World Bank, ADB, CDIA, AWGESC, and ASEAN Secretariat, through organising the High Level Seminar on Environmentally Sustainable Cities.

#### **4) *Outputs and Impacts Created***

Main outputs and impacts created by the programme were already described. The point which can be stressed here is the development of replication models of good practices through actual implementation and analysis of composting projects. These practices have the potential to be further replicated in other cities, and these models also have the potential to be applied to environmental management areas other than solid waste management. Although the KI programme is closing, the need for effective dissemination of good practices and policies among local governments will ever rise reflecting the demand for development of low-carbon, environmentally sustainable, biodiversity-conserving and climate change resilient cities. In that sense, the role of inter-mediators, including inter-city networks, will continue be vital, and the experience accumulated through the operation of the programme and development of replication models are precious knowledge to apply to this direction.

### **7. Conclusion: Overall Evaluation of the KI Programme and the Way Forward**

As outcomes of the ten-year long operation of the inter-city network, the programme has seen actual environmental improvements in many member cities in a wide range of areas, including solid waste management, wastewater treatment, air quality management, nature conservation, parks and greenery management, and involvement of residents, community groups and private companies in environmental management activities. These improvements were confirmed by actual site visits, presentations made by the cities on various opportunities, and the results of environmental commitments expressed by the cities. As a result, some of the member cities have become prominent leading environmental cities in their respective countries, as well as in the region, and are recognised by various kinds of environmental awards conferred to them and a number of pilot and demonstration projects assisted by central governments and external organisations being implemented in these cities.

These lessons learnt through practical operation and management of an inter-city network and the close relationships developed with member cities, as well as with other organisations, are precious assets that can be utilised to improve and restructure the current inter-city networking system and to develop a new mechanism.



## Bangkok Office

### Implementation of the GMS study

This project entailed collaborative work between the Asian Development Bank (ADB), UNEP and IGES to implement Component III of the Greater Mekong Subregion (GMS) Core Environment Program (CEP) which focuses on environmental performance assessment (EPA) and sustainable development planning (SDP). This was a three-year project, and IGES was primarily responsible for SDP aspects while it also provided assistance to UNEP, the secretariat, in the implementation of EPA aspects. Through attendance at Working Group on Environment (WGE) meetings and frequent assistance to staff of the Environment Operations Center (EOC), IGES contributed to other components of the CEP and the EOC assistance provided to the member countries (Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam, and Yunnan and Guangxi Provinces of China). IGES also contributed to the informal partners' advisory group to the EOC, the appraisal mission of the proposed Finnish assistance to the next phase of the CEP, and the mid-term reviews of the CEP.

#### <Research activities and outcomes>

- Contribution to the development of a training course on sustainable development planning;
- Cooperation with a Thai training institution under MONRE for subsequent training;
- Cooperation with UNEP as a follow-up to the National Sustainable Development Strategies project;
- Preparation of a regional technical assistance proposal on sustainable development planning;
- Assistance with EPA reports in the six GMS countries;
- Contribution to GMS subregional EPA;
- Finalisation of technical guidelines and training manuals for EPA and sustainable development planning;
- Identification of future sustainable development planning needs in the GMS countries.

#### <Outreach of outcomes/outputs>

- Preparation of an EPA training manual on SDP. Submission of manual to ADB.

### Network for Integrated Planning and Sustainable Development Strategies in Asia-Pacific region (SDplanNet - Asia&Pacific)

IGES has been contracted by the International Institute for Sustainable Development (IISD) to coordinate this network through its office in Bangkok since July 2008. The contracted period of this network operation under the current form of assistance and management is three years (2008-2010). In connection with this role, the IGES Bangkok Office has been requested to participate in a wide variety of activities in the region related to sustainable development such as (i) the APEC Center for Technology Foresight Symposium, "Towards Low-Carbon Society in Asia-Pacific 2050"; (ii)

ProSPER.Net; (iii) ESCAP expert group meeting on Low Carbon Society; (iv) Seventh National Plan for Lao PDR; (v) Asia-Pacific Regional Media Forum convened by the Global Subsidies Initiative and the Inter Press Service – Asia-Pacific Bureau, 23–24 July 2009; (vi) ASEAN+3 Dialogues on Education for Sustainable Development; and (vii) ASEAN+3 Leadership Program on Sustainable Production and Consumption, among others.

#### **<Research activities and outcomes>**

- Completion of annual conference in September 2009;
- Completion of second and third bi-monthly virtual learning events;
- Increased membership to 200+ and created a Thai National Chapter;
- Communication with similar European, Latin American and Caribbean networks;
- Co-organised the APEC “Towards Low-Carbon Society in Asia-Pacific 2050” workshops in Phuket and Bangkok in conjunction with the APEC Center for Technology Foresight, National Science, Technology and Innovation Policy Office (STI), Thailand;
- Contributed to other related workshops and meetings in Bangkok, such as Nagoya University’s Global Environmental Leadership Program, Promotion of Sustainability in Postgraduate Education and Research Network (ProSPER.Net), and the Global Subsidies Initiative Asia-Pacific Regional Media Forum.

#### **<Outreach of outcomes/outputs>**

- Website (SDplanNet-AP) providing a platform for SDP practitioners to form a community of practice. The network also provides regular bi-monthly virtual training events using e-learning approaches. A blog provides updated information on topical news items, while the home page lists upcoming events of interest;
- SDplanNet-AP brochure;
- Low Carbon Development Path in Asia-Pacific: A Background Paper, by Dr. Peter N. King;
- Integration of Climate Change into National Planning, by Dr. Peter N. King and Uma Wirutskulshai.

### **Support for Creating the Sustainable Hydropower Criteria for the GMS**

As an offshoot of earlier work on the GMS study, IGES was contracted by the Mekong River Commission (MRC) in 2008 and prepared a project for further development of the environmental criteria and their testing in strategic environmental assessments (SEA).

#### **<Research activities and outcomes>**

- Completion of all activities under the project and submission of final report. Continuation of this work will be done under ECO-Asia, with IGES support.

#### **<Outreach of outcomes/outputs>**

- Preparation of the project design document for the sustainable hydropower project, which was accepted by the Mekong River Commission. The project is currently under implementation with the Mekong-adapted International Hydropower Association, sustainability guidelines

being tested in two strategic environmental assessments (one on the mainstream Mekong River, the other on the Srepok, Sekong, and Sesan river basins). ECO-Asia has issued a contract to HydroTasmania to complete the work of developing a basin-wide sustainability assessment protocol.

### **Support for the International Waters: Learning Exchange and Resource Network - Coral Triangle Initiative**

IGES was contracted by UNDP to prepare a project document for GEF funding of a full-sized project to foster structured learning, information sharing, collaboration and replication across GEF's International Waters portfolio involving the governments of relevant countries in the area.

#### **<Research activities and outcomes>**

- Completion of all activities under the project. Project was approved by GEF and is currently under implementation.

#### **<Outreach of outcomes/outputs>**

- Preparation of a full-sized project for UNDP and ADB implementation. ADB is currently recruiting consultants. International Waters Conference was held in Cairns, Australia in October 2009. Global Oceans Day was held at COP15 in Copenhagen in December 2010.

### **Global Environment Outlook (GEO-4)**

IGES Bangkok Office staff, in addition to staff from headquarters, contributed to the regional and global environmental outlooks prepared by UNEP, as one of the many collaborating centres. The IGES Bangkok representative was involved as a lead author in the policy chapter of GEO-4, as well as contributing to other chapters and the executive summary. Drafting and consultation workshops were held in Cairo, Copenhagen, Norway, and Nairobi during 2007.

#### **<Research activities and outcomes>**

- Completion of all activities under the project and publication of the final results.

#### **<Outreach of outcomes/outputs>**

- UNEP developed a comprehensive outreach program for GEO-4, including an "ask the experts" forum on its website, in which the IGES Bangkok Office representative was featured.

### **Support for Asian Environmental Compliance and Enforcement Network (AECEN)**

AECEN is a network of environmental agencies from 14 countries in Asia dedicated to improving performance in relation to compliance and enforcement of national laws and multilateral environmental agreements. AECEN operates primarily by twinning countries through South-South cooperation to share good practices and to assist each other in capacity building. AECEN is also

strengthening the capacity of environmental courts and the judiciary responsible for environmental cases throughout Asia. IGES represents the Ministry of the Environment Japan (MOEJ) on the Executive Board of AECEN, and at its annual conference in Singapore in 2009, the IGES Bangkok Office was selected as the permanent secretariat for AECEN.

#### **<Research activities and outcomes>**

- Twinning arrangements with China on energy efficiency laws and with Thailand on soil contamination;
- Proceeding to contract between AECOM and IGES for transfer of secretariat;
- Small scale technical assistance funded by ADB on strengthening the environmental judiciary in China and Indonesia.

#### **<Outreach of outcomes/outputs>**

- AECEN annual conference;
- Reports on twinning operations and policy briefs;
- AECEN video;
- AECEN website.

### **Support for UNEP Climate Change Program**

In 2007, IGES agreed to second a climate change specialist (Dr. Tamura) from headquarters to assist UNEP in developing specific project proposals on climate change and to help represent UNEP in related dialogues. Although the original agreement was for a 12-month secondment, the arrangement was terminated after six months, although UNEP was quite pleased with the progress made in that short period.

#### **<Research activities and outcomes>**

- Preparation and implementation of specific project proposals (in conjunction with UNEP) on climate change.

#### **<Outreach of outcomes/outputs>**

- Several projects were prepared, including one major project in the Philippines, and these are now under implementation.

### **Support for Climate Change Adaptation Network**

As a joint program with UNEP, IGES is providing secretariat support for a newly formed climate change adaptation network. Funding is expected from MOEJ, SIDA, and ADB in the order of 1.4 million USD for the period 2009-2010. The network will also link with the Climate Change Adaptation Platform being funded by SIDA/SENSA and implemented by UNEP and the Stockholm Environment Institute (SEI), with two million USD in funding. This project is being undertaken by the Natural Resources Management Group with assistance from the Bangkok Office.

**<Research activities and outcomes>**

- Network is newly established. A detailed implementation plan was prepared for the first meeting of the Steering Committee in February 2010. The IGES Bangkok Office assisted in the logistics for the Steering Committee meeting as well as participating in discussions.

**<Outreach of outcomes/outputs>**

- Not applicable yet.

**Support for IGES activities in Bangkok and coordination with UN organisations stationed in Bangkok**

The IGES Bangkok Office is instrumental in assisting various IGES projects through maintaining close collaboration with international organisations and research institutes located in Bangkok and other cities in Southeast Asia, and providing general support to the research activities of IGES projects in the same area. The Bangkok Office also helps to identify project opportunities being developed by funding agencies located in Bangkok and provides strategic advice on marketing IGES services. The Bangkok Office is also fully engaged in preparation of IGES White Papers.

**<Research activities and outcomes>**

- Preparation of joint research funding proposals and collaboration in ongoing research activities with the Stockholm Environmental Institute (SEI);
- Attendance at SENSEA retreats with presentations on various topics;
- Liaison with UNESCAP, UNEP-ROAP, World Bank, UNDP and ADB;
- Continued liaison with the Environment Operations Center (EOC) on the GMS Core Environment Program (CEP) (as well as finalising work conducted under Phase 1 of the CEP);
- Attendance at IGES Board meetings and other major events coordinated by IGES, such as the Co-benefits Seminar in Bangkok in March 2010;
- Continued assistance with ongoing IGES projects, such as the Economic Research Institute for ASEAN and East Asia (ERIA).

**<Outreach of outcomes/outputs>**

- Various research proposals submitted to headquarters for potential interest in participation;
- Joint publications with UNEP and ADB.

**Self-evaluation**

- **Relevance** – The work of the Bangkok Office is highly relevant, not only to the countries involved in the various projects, but also to the international perspective of IGES. By maintaining high visibility and a strong presence with the various international agencies (UN, bilateral, multilateral, private sector) with regional headquarters in Bangkok, the IGES Bangkok Office portrays IGES in a very positive light.
- **Effectiveness** – For the relatively small staff of the Bangkok Office (four people), it is remarkably effective and conveys an impression of a much larger organisation. At virtually

every relevant event in Bangkok, IGES is represented and makes a very significant contribution.

- **Efficiency** – The Bangkok Office runs at very little cost to IGES, as most of the funds are raised externally (e.g. SDplanNet-AP, AECEN, and the Climate Change Adaptation Network). It has no major overheads and efficiently uses the funds and human resources available.
- **Outputs and impacts created** – For a small office, the extent of outputs and impacts achieved by the small staff is laudable. The various networks being run by the office help to connect virtually all the key actors in the environmental field across Asia. Contributions to GEO4, the IGES White Paper, the EOC training manual, and other publications have had a significant influence in creating awareness of policy options, strengthening capacity of environmental agencies, and in establishing IGES as a reliable source of well-researched environmental policy advice.

## **Conclusion**

FY2009 has been a very successful year for the IGES Bangkok Office. It is now strategically poised to capitalise on the three main networks under control of the office, to make a major contribution to environmental compliance and enforcement in the region, and to advance the implementation of adaptation measures throughout the region. By establishing a formal presence in Thailand in FY2010, expanding the office with additional staff, and maintaining the strong liaison role and assistance to IGES headquarters staff, the Bangkok Office is set to really help IGES become recognised as the main international environmental policy think tank in Asia and the Pacific.

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