Towards A Sustainable Asia-Pacific
IGES 10th Anniversary

IGES 10th Anniversary Symposium Report

Strategy to Combat Climate Change in Asia and the Pacific

Saturday 21 June 2008

Institute for Global Environmental Strategies (IGES)

This report includes additions and alterations of the record of the symposium below which was held on 21 June 2008, in commemoration of IGES 10th Anniversary.

IGES 10th Anniversary Symposium Report

Strategy to Combat Climate Change in Asia and the Pacific

Date:	Saturday, 21 June 2008
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Foreword

Recently global environmental issues, in particular climate change, have been gaining so much attention worldwide that they have become the main issues at the G8 summit conferences. In the light of economic development and population growth, greenhouse gas emissions look set to increase in the region headed by China and India. Overcoming serious poverty and attaining economic growth while at the same time limiting and then reducing greenhouse gas emissions, as well as achieving sustainable development, requires enormous effort. On the other hand, we have to deal with issues that threaten the survival of nations such as flooding of land due to rising sea levels, and the decline of food production because of climate change.

IGES, responding to these global challenges and the needs of the Asia Pacific region, considers it an important mission to propose strategies and policies that contribute to realising a sustainable society.

IGES celebrated the 10th anniversary of its establishment in April 2008, and organised a symposium in June of the same year, focusing on the theme of reuniting climate change and sustainable development for the Asia Pacific region. Experts in this field from Japan and overseas were invited to the symposium which attracted an audience of more than 300.

We learned various keywords from the speakers at the symposium. An example would be low-carbon economy. It is becoming a common perception as one form of sustainable society that we should be aiming at. However, we face a great many challenges that need to be overcome first. These involve issues such as conflicting views held by developed and developing countries, and integration of climate policies into national development plans and sectoral economic policies. There is also the problem of how to meet both the needs of current and future generations.

How are we to overcome these challenges? On 21 June 2008, the day of the symposium, IGES launched its White Paper focusing on climate change policies in the Asia Pacific region. The title of this publication is “Re-uniting Climate Change and Sustainable Development”. We must consider how best to unite and harmonise various views, opinions and interests, which is the path to take in the future.

With the increasing sense of uncertainly in the global economy, it will not be easy to promote sustainable development and encourage the transition to a low-carbon society. IGES hopes to enhance collaboration with broad range of stakeholders such as international organisations, national and local governments, businesses, NGOs, citizens and experts that it has built up over the past 10 years, and try its best to achieve its mission.

Hironori Hamanaka
Chair, IGES Board of Directors
January 2009, Hayama

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Opening Remarks

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(Chair of the Board of Directors, IGES)

Guest Speeches

Ikuzo Sakurai
(Senior Vice-Minister of the Environment, Japan)

Shigefumi Matsuzawa
(Governor of Kanagawa Prefecture, Japan)

Hironori Hamanaka

Chair of the Board of Directors, IGES

Good afternoon. It is our great pleasure today to welcome such a large number of participants to the 10th anniversary symposium of the Institute for Global Environmental Strategies. On behalf of IGES, I would like to express our sincere appreciation to each one of you for your participation.

Our symposium today is entitled "Strategy to Combat Climate Change in Asia and the Pacific" commemorating the 10th anniversary of the establishment of IGES. If I may take slightly more time than is usual for opening remarks, I would like to explain what sort of organisation IGES is, what sort of research we conduct, and what directions we will be taking.

IGES is an independent research institute established ten years ago, in 1998, under the initiative of the government of Japan. A year previous to this, in 1997, Japan hosted COP3 in Kyoto, the Third Conference of Parties to the U.N. Framework Convention on Climate Change, which adopted the Kyoto Protocol. In the same year, a total of 30 international organisations, governmental bodies and research institutes signed the Charter for the Establishment of IGES, and the IGES headquarters were set up in March 1998 in Shonan Village in Hayama with the support of Kanagawa Prefecture. The number of organisations that have signed the IGES Charter has since grown to 48.

What is the mission of IGES? A wide range of entities such as government, international organisations, industry and citizens' groups are working for sustainable development in the Asia-Pacific region, and IGES is conducting research on the policies and actions of these public- and private-sectors. Our research is not simply for the sake of research, where value is in the research itself, as is found in many universities and other research institutes. Instead, IGES conducts research that is strategic, innovative and practical, and works to make its results reflected in the actual policymaking process. To put it more simply, the mission of IGES is to conduct pragmatic research that can serve a useful purpose.

What is strategic research?

So what is this strategic, innovative, and pragmatic policy research? What sort of research is it that can contribute to policymaking? To be pragmatic is to be useful, and being useful can, for example, mean providing swift answers to the varied problems that we face right now. On the other hand, when we consider that our conventional lifestyles might bring about serious social situations in the future and that to avoid this, we need to make fundamental changes now, being useful could also mean preparing for transformation or innovation for the future.

Given these many different ways of being useful and practical, what should IGES be aiming for? There are many companies offering consulting services which meet the diverse needs of government and business. In what way can IGES contribute that is different from these consulting firms? This question may not be all that easy to answer. However, we may say that our objective at IGES is, based on our own research results, to provide practical and effective proposals for international organisations, governments, private firms, citizens' groups, and other bodies working to achieve sustainable development in the Asia-Pacific region.

Innovation and strategies required in the Asia-Pacific

The Asia-Pacific region is experiencing remarkable economic growth. This has been accompanied by population increase, urbanisation, and industrialisation, which may have led to the evermore serious depletion of natural resources and the environmental pollution. Turning to the issue of climate change, Asia is the region that is now generating the largest environmental stress in the world. Unless effective actions are taken in Asia, resolution of the problem will become even more difficult. In this sense, the Asia-Pacific region has an ever-greater role to play in international efforts to resolve climate change and other environmental issues.

On the other hand, large numbers of people in Asia are still suffering from poverty. Reducing poverty has made economic development a long-standing priority for many developing countries. However, economic development should not be allowed to promote pronounced change in global climate and ecological systems which will threaten the essential foundations of human society. Therefore, it is urgently required to explore development models that do not let that happen and are fundamentally different from those of the past.

Some people may argue that it is developed countries that are responsible for most of the destruction of the Earth's environment to date and in this context, it has been suggested that developed countries should lead the way in demonstrating how to bring about fundamental change in the current models of wasteful production and consumption and make them sustainable. In fact, representatives of developing countries have emphasised this point repeatedly at United Nations conferences. The argument is quite reasonable and I believe both developed and developing countries must now shift to new ways of doing things that are fundamentally different from those we have taken to date. We must think carefully about how we are going to actually achieve this. To meet this challenge, IGES is able to offer practical and effective proposals, as its unique contribution which is different from that of other research bodies and consulting firms. It is in this sense that I believe we are required to be innovative and strategic as well as practical.

Missions and roles; Sharing ideas in IGES

It has not in fact been easy, however, for IGES researchers to share in this thinking. A total of 60 researchers from various regions and nations including Japan, other parts of Asia, and the West are working at IGES, and many of them are employed at IGES after their primary training as researchers in university post-graduate and doctoral courses and, frequently, after subsequent employment at other research bodies or universities. As a result, they do not necessarily have a clear idea from the beginning what strategic, innovative and practical policy research is. Rather, they tend, in many cases, to pursue research based on their own personal interests rather than seeking ways to apply their research results in actual policy. That, however, makes it difficult to produce the research results that would achieve the mission of IGES.

It is therefore very important for IGES researchers to share a clear vision of how to conduct

research to achieve the IGES mission. This is easier said than done, but we have had many meetings among researchers at IGES, and have spent a considerable amount of time with them in extended discussion on what sort of research IGES should carry out and in what way, with the support of those who have been successful as leaders at research institutes with objectives similar to those of IGES.

This is an extremely laborious process, and my predecessor as Chair – the first Chair of IGES – Prof. Akio Morishima demonstrated tremendous leadership on this matter. Thanks to his concerted efforts, in February 2007, the Board of Directors approved the adoption of an Integrative Strategic Research Programme that provides a clear statement of the basic direction of research required to achieve the mission of IGES.

Integrative Strategic Research Programme

This Integrative Strategic Research Programme stipulates that research performed by IGES is characterised by having a focus on actual issues; taking an interdisciplinary approach, and proposing certain solutions within specific time periods. It also provides some important criteria when IGES determines which research programme should be undertaken; having policy significance, addressing issues of importance from an Asia-Pacific or international perspective, rather than those limited to specific countries or areas; and generating unique added value as IGES – in other words, such research will make results capable of adding greater value, rather than identical to what those other research institutes are doing.

Under this Programme, IGES is conducting diverse research projects on climate policy as well as biofuels, forest conservation, freshwater, waste and resources, business and the environment, and capacity development and education for sustainable development. The formulation of this Integrative Strategic Research Programme has provided us with important principles that drive research activities in the direction of achieving our original mission.

Release of IGES Second White Paper

Japan, in hosting the G8 summit this year, has raised climate change as one of the most important issues. Studies on an international framework on climate change post-2012, following the end of the first commitment period of the Kyoto Protocol, started under the roadmap which was adopted at Bali, Indonesia, in December 2007. The efforts of Asian and other developing countries have become more significant concerns to be discussed. In this context, IGES today presented its second White Paper, which focuses on these issues of climate change.

Under the theme of “Strategies to combat climate change in Asia and the Pacific,” not only the Climate Policy Project but all the research projects at IGES dealing with issues such as forest conservation, biofuels, waste and resources, freshwater, and business and the environment united to produce this White Paper. Each project conducted analysis focusing on its research area impacted by climate change. The outcomes of these analyses form the basis for policies proposed therein.

It is our sincere wish that the analysis and policy proposals in this White Paper prove of significant use to all stakeholders. We very much hope that, with little more than two weeks to go before the G8 summit in Toyako, Hokkaido, today's symposium will produce a lively and fruitful discussion.

Reflecting research results in the actual policymaking process

IGES will use the results of this symposium to drive our research activities further to achieve our mission. While considering the reality of the Asia-Pacific region as well as keeping an international perspective, IGES will make efforts to obtain research results of high quality with the added value that IGES alone is capable of, and based on those results, to develop policy proposals that are yet more innovative and strategic, as well as to ensure such proposals are reflected in the actual policymaking process.

IGES activities have won greater recognition in international society in recent years, and going forward, we will seek to gain further involvement in policy processes -- sometimes with an eye to creating new policy processes in collaboration with other institutions involved -- and pursue further efforts to ensure that the results of our research are reflected more effectively in policymaking. We will also proceed with the capacity building of our researchers so that they can take up these challenges. We are confident that this active engagement in policy processes will bring us deeper insights into policymaking and that this will constitute an important base to achieve the mission of IGES.

This 10th anniversary is a significant milestone for IGES, and we will engage the collective efforts of our researchers and other staff to pursue further research activities and commitments. Allow me to conclude my opening remarks with a request for your continued understanding, support, instruction and encouragement.

Thank you very much for your attention.

Ikuzo Sakurai

Senior Vice-Minister of the Environment, Japan

I have some remarks to offer on the occasion of the 10th anniversary of the founding of the Institute for Global Environmental Strategies.

Allow me to offer IGES my heartfelt congratulations on reaching its 10th anniversary thanks to the combined efforts of the Chair of the Board of Directors, Prof. Hamanaka, former Chair, Prof. Morishima, the IGES Board of Directors, its Trustees, and its team of researchers. I would like also to express my deep gratitude to Governor Matsuzawa and the rest of Kanagawa Prefecture for their consistently strong support of IGES since its foundation. Let me add my sincere thanks to the people of Hyogo Prefecture and Kitakyushu City for their extraordinary support for the local offices IGES has established there.

Climate change and other aspects of the global environment will be central to the agenda of the Toyako Summit on 7 July. The so-called “Fukuda Vision for a Low-carbon Society” announced by former Prime Minister Fukuda on 9 June stresses the achievement of a low-carbon society comparable to the Industrial Revolution and seeks Japanese leadership in the endeavour.

Over the ten years since its foundation in 1998, IGES has conducted policy research on such issues as climate change in the Asia-Pacific region with the objective of achieving sustainable development. Widely influential in the world, IGES research products achieved through international cooperation constitute a foundation for demonstrating Japanese leadership in climate change issues.

This well-regarded track record is one reason that the number of governmental organs, research organs, and international organisations signing up to the IGES Charter for the Establishment has grown from just 35 at the outset to 48 today. IGES has further opened international offices in China and Thailand. I consider it truly welcome that the efforts of everyone involved over these ten years have led to acclaim for the work produced by IGES and greater international recognition for the organisation.

In addition to its regular activities, IGES has made an extremely large contribution to the Intergovernmental Panel on Climate Change, the IPCC. Under the direction of board director, Mr. Hiraishi, IGES has worked for nine years to establish a methodology for calculating volumes of greenhouse gas emissions and absorptions, one of the four major tasks of the IPCC. I rather think

that the IGES contribution was a major factor in the IPCC being awarded the Nobel Peace Prize last year.

IGES is also home to the secretariat of the Asia-Pacific Network for Global Change Research, the APN. With the full backing of Hyogo Prefecture, this network plays a major role in improving global change research in the Asia-Pacific region.

It is a great pleasure to me that IGES has developed steadily over these past ten years and, as a result, won a strong reputation among governmental experts around the world. It is my strongest hope that as a strategic research organisation, IGES will make further contributions towards the achievement of the extremely difficult task of sustainable development in the Asia-Pacific region protecting the global environment.

In closing, I would like to ask that everyone involved continue to provide unstinting support for these efforts and I offer my prayers for the continued development of IGES.

Shigefumi Matsuzawa

Governor of Kanagawa Prefecture, Japan

I would like to express my great pleasure in the celebrating the 10th anniversary of the Institute for Global Environmental Strategies in April this year of, and in the holding of this symposium to mark the occasion.

IGES was founded in 1998 as an international research organisation to perform practical, innovative, and strategic policy research with the objective of achieving sustainable development in the Asia-Pacific region, which has experienced extraordinary population growth and economic development. I believe that attracting IGES to the Kanagawa Prefecture and supporting its activities is making an international contribution in the environmental field. In addition to providing dedicated research facilities in Shonan Village to fulfil our duties as host prefecture, Kanagawa also provides important support by disseminating IGES research outputs around the world.

IGES has fostered a wide range of research activities since its foundation and achieved a reputation in the world far exceeding our expectations. In addition to assisting with our global warming policies, IGES researchers also contribute to environmental preservation in Kanagawa Prefecture through their research outcomes in such ways as holding seminars and symposia on issues of the global environment.

This year marks the start of the first commitment period of the Kyoto Protocol, and global environmental issues will be a major theme of the Toyako Summit in Hokkaido in July. This should make it the year in which the world initiates serious action towards resolution of this issue shared by all mankind. In Kanagawa, we consider this year our start for the construction of a society that leaves global warming behind once and for all, and in January, I issued the prefecture's Cool Renaissance declaration, a call for global revival. This Cool Renaissance declaration comprises 11 flagship projects, including an electric vehicle promotion project, a solar power generation expansion project, and an international collaboration campaign. The goal is to begin where we are able and spread the global revival from Kanagawa around the world.

Joining us today is Dr. Pachauri, who serves as both IPCC chair and an IGES board director. When I described the Cool Renaissance declaration to him earlier, he expressed strong approval. In his speech earlier, Dr. Pachauri described to us the various kinds of research work carried out by TERI, the Energy and Resources Institute that he heads, as well as explaining about the Lighting a Billion Lives campaign that provides solar lanterns to households in parts of India lacking adequate electric

power supply. I made a commitment to him there that Kanagawa Prefecture would provide its full cooperation with this project of great significance.

I believe it will remain the ambition of Kanagawa Prefecture to continue to be involved in halting global warming and in other aspects of preservation of the global environment, and we hope to do so in cooperation with IGES across a range of efforts. It is my heartfelt prayer that IGES will grow ever more active in its research activities and contribute to the achievement of sustainable society on a global scale.

In closing, I would like to take this opportunity to invite Dr. Pachauri to join me on the stage to make a brief joint declaration. Dr. Pachauri, please step up, if you would. We signed a joint declaration earlier; I wonder if you please give a brief comment on it.

(Dr. Pachauri)
Well, I am privileged to be here and with His Excellency, the governor. I am particularly moved by his commitment to this programme that we have started, Lighting a Billion Lives. And it would be our privilege and our mission to work together with you, Mr. Governor. Thank you very much and I also appreciate your interest in promoting closer ties between our two institutions and certainly between your prefecture and India. And for this, may I request you to come to New Delhi next year in February. And as a token of Lighting a Billion Lives which is promoting the use of solar lanterns and in some cases the use of solar torches also, I would like to give this to His Excellency, the governor. This is a solar torch. And as this instruction says if you keep it exposed to sunlight for six hours, it will give you six to eight hours of lighting. Even if you keep it in defused light for about that period you will get about three or four hours of lighting on a regular basis.

(Governor Matsuzawa)
Excellent. Thank you.

Keynote Session

Ryokichi Hirono (Moderator)

Yoriko Kawaguchi

Rajendra Pachauri

[Discussion]

Keynote Session

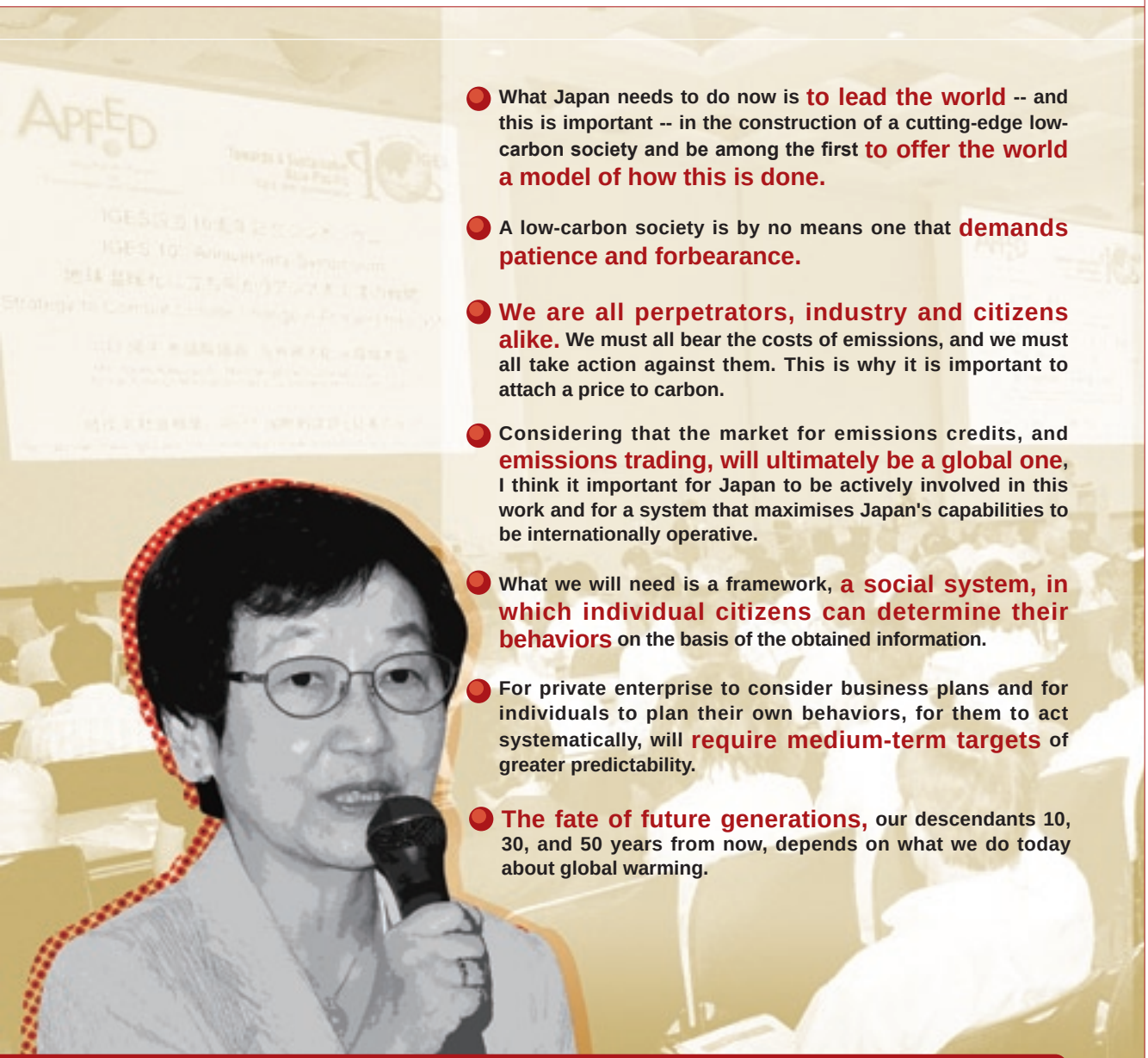
Moderator

Ryokichi Hirono

Professor Emeritus, Seikei University

Profile

Prof. Ryokichi Hirono graduated from the University of Chicago in 1959 and served as Assistant Secretary-General of the United Nations during the 1980s. He chaired the Committee for Development Policy, U.N. Economic and Social Council (New York) during the 1900s and early 2000s, and has been active in the work of the U.N. and many other international organisations as expert and consultant. He is now teaching International Development at the National Graduate Institute for Policy Studies (GRIPS) in Tokyo. Prof. Hirono has been active for decades in Japanese government advisory councils on Environmental Policy, Foreign Economic Cooperation Policy, Forestry Policy, International Education Cooperation Policy, ODA Policy and Evaluation, and Overall Macroeconomic Policy. Currently, he holds various public positions, including member of the Central Environment Council of Japan (Tokyo) as well as member of the International and Editorial Advisory Board of Singapore Economic Review (Singapore), Journal of Human Development (New York) and Adjunct Professor, Graduate Management Institute of Mongolia (Ulaanbaatar). Over 600 of his books, reports and journal articles have been published in Japan and overseas.



- What Japan needs to do now is **to lead the world** -- and this is important -- in the construction of a cutting-edge low-carbon society and be among the first **to offer the world a model of how this is done.**
- A low-carbon society is by no means one that **demands patience and forbearance.**
- **We are all perpetrators, industry and citizens alike.** We must all bear the costs of emissions, and we must all take action against them. This is why it is important to attach a price to carbon.
- Considering that the market for emissions credits, and **emissions trading, will ultimately be a global one**, I think it important for Japan to be actively involved in this work and for a system that maximises Japan's capabilities to be internationally operative.
- What we will need is a framework, **a social system, in which individual citizens can determine their behaviors** on the basis of the obtained information.
- For private enterprise to consider business plans and for individuals to plan their own behaviors, for them to act systematically, will **require medium-term targets** of greater predictability.
- **The fate of future generations,** our descendants 10, 30, and 50 years from now, depends on what we do today about global warming.

International Challenges and the Role of Japan towards Establishing a Low-carbon Society

Yoriko Kawaguchi

Member of the House of Councilors; Former Minister for Foreign Affairs; Former Minister of the Environment, Japan

Profile

Ms. Yoriko Kawaguchi is a member of the House of Councilors and Deputy Chair of the Policy Research Council in the Liberal Democratic Party of Japan. Prior to her current position, she served as Minister of the Environment, Minister for Foreign Affairs, and Special Advisor to the Prime Minister, responsible for foreign affairs. During her 30 year career at the Ministry of International Trade and Industry, Japan, she served positions such as Minister at the Embassy of Japan in the U.S.A. and an economist at the World Bank. She is a graduate of the University of Tokyo (BA in International Relations) and Yale University (M.Phil. in Economics). Since 2005 she has served as the chairperson of the Asia-Pacific Forum for Environment and Development Phase II (APFED II), and has held positions such as Member of the Club of Madrid/UN Foundation High-level Task Force on Climate Change and Advisory Board Member of the Energy and Climate Change Working Group, Clinton Global Initiative.

International Challenges and the Role of Japan towards Establishing a Low-carbon Society

Yoriko Kawaguchi
Member of the House of Councilors; Former Minister for Foreign Affairs; Former Minister of the Environment, Japan

"Cool Earth 50" and "The Fukuda Vision"

For tackling global warming problem, Japan currently faces two major sets of policy challenges. One, of course, is achieving the reduction of 6 % that we committed to in the Kyoto Protocol. And the other is to create, together with international society, a new post-2013 regime for the world and to execute Japan's portion. These are our two policy challenges.

It was in view of these challenges that in May of last year, Prime Minister Abe made his "Cool Earth 50" proposal for halving worldwide emissions by 2050. In Davos in January of this year, Prime Minister Fukuda announced his own Cool Earth concept in his proposal for a cooperative international financial mechanism called the Cool Earth Partnership involving technology and society as a whole and with the increase in global emissions peaking out in the medium term.

In order to implement policy principles of Prime Minister Fukuda for action on global warming in a concrete way within Japan, he proposed a Japanese policy initiative for action on warming called the Fukuda Vision on 9th June in a speech entitled "In Pursuit of Japan as a Low-carbon Society". The Fukuda Vision describes a policy aiming to make reductions of 60 % to 80 % in Japan by 2050 and sets out such government policies as the introduction and propagation of advanced energy-saving and new energy technologies and upgraded efforts on behalf of society as a whole.

What Japan now needs to do in "leading the world"

What Japan needs to do now is to lead the world -- and this is important -- in the construction of a cutting-edge low-carbon society and be among the first to offer the world a model of how this is done. A low-carbon society is one that makes the most efficient possible use of energy and resources. It is one that successively generates cutting-edge technologies and propagates them rapidly. I consider the emergence of such societies around the world as a necessary condition for a long-term solution to the problems posed by global warming and to such cost issues as runaway world energy and resource prices.

A low-carbon society is by no means one that demands patience and forbearance. Japan is foremost in the world in terms of the energy- and resource-conserving technologies available to us. And we have the human resources, the technologies, the policies to sustain them. With such advantages as these, I believe that for Japan to achieve the construction of a low-carbon society sooner rather than later will enhance the international competitiveness of our industries and enhance the attractiveness of our capital markets.

I believe technology will be our source of traction in the 21st century. I consider it our nation's duty to mankind and the path that we should take to construct a model of cutting-edge low-carbon society and take the initiative in presenting it to the world and issuing a call for actions to national governments,

international organisations, NGOs and other of the world's primary actors. I also consider this to be in Japan's national interest.

Putting a price on carbon

What the IPCC's fourth report made plain is that we cannot go on emitting as much carbon as we please at no cost. Human activity is the cause of greenhouse gasses. Therefore, **we are all of us perpetrators, industry and citizens alike. We must all bear the costs of emissions, and we must all take action against them. This is why it is important to attach a price to carbon.** It costs something to emit carbon in large volumes, and we need to consider as a basic element of our social framework a relative reduction of emission cost by curtailing carbon emissions. This will lead, for example, to increased supply of renewable energy and to increased demand for household appliances that incorporate energy-saving technologies. This makes it possible to foster a society in which people who exert themselves in support of reductions are rewarded and people who scorn such efforts suffer.

The construction of a low-carbon society will impose significant costs across the whole of society, but to pursue this course efficiently, I think it will be important to employ the efficient resource allocation functions of the price mechanism. Emissions trading is now being discussed as a new economic tool; it is present within the Kyoto Protocol, and it is in operation in the EU and other countries.

International system of price mechanism

At present, discussion on international coordination of the system is conducted at an organisation called ICAP. **Considering that the market for emissions credits, and emissions trading, will ultimately be a global one, I think it important for Japan to be actively involved in this work and for a system that maximises Japan's capabilities to be internationally operative.** If and when that happens, I believe we should take a sector-specific approach and build on our experience expanding the current framework of voluntary emissions trading to advocate actively for fair and rational rules and their reflection in the development of international standards.

There remain some issues and problems requiring further study with respect to emissions trading. As we continue to examine these and continue to overcome them, the recent interim report on global warming action of the Liberal Democratic Party, which I compiled as secretary general, states that it is advisable to commence preparations for domestic trading as of 2010. The Prime Minister speaks of an experimental market in operation as of this autumn. I think that these developments will deepen and add to our understanding of emissions trading going forward.

A social system in which individual citizens can determine their behaviours

Next, I'd like to speak a bit about the importance of information. The effort to mitigate global warming must be one that involves all our citizens. This will require information on how much our individual behaviours contribute to greenhouse gas emissions and on how much some given behaviours can contribute to their reduction. **What we will need is a framework, a social system, in which individual citizens can determine their behaviours on the basis of the obtained information.**

Debate is currently proceeding in a multi-partisan parliamentary group, which is moving towards the introduction of a parliamentarian's bill to implement summer time -- that is, setting the clocks one hour ahead from spring through summer -- as an energy-saving measure beginning the year after next, or in March 2010.

I think it will also be important to consolidate arrangements for carbon footprints that quantify carbon emissions from the production and transportation of foodstuffs and other products and for carbon offsets that allow greenhouse gas emissions from day-to-day living to be offset against, for example, afforestation projects.

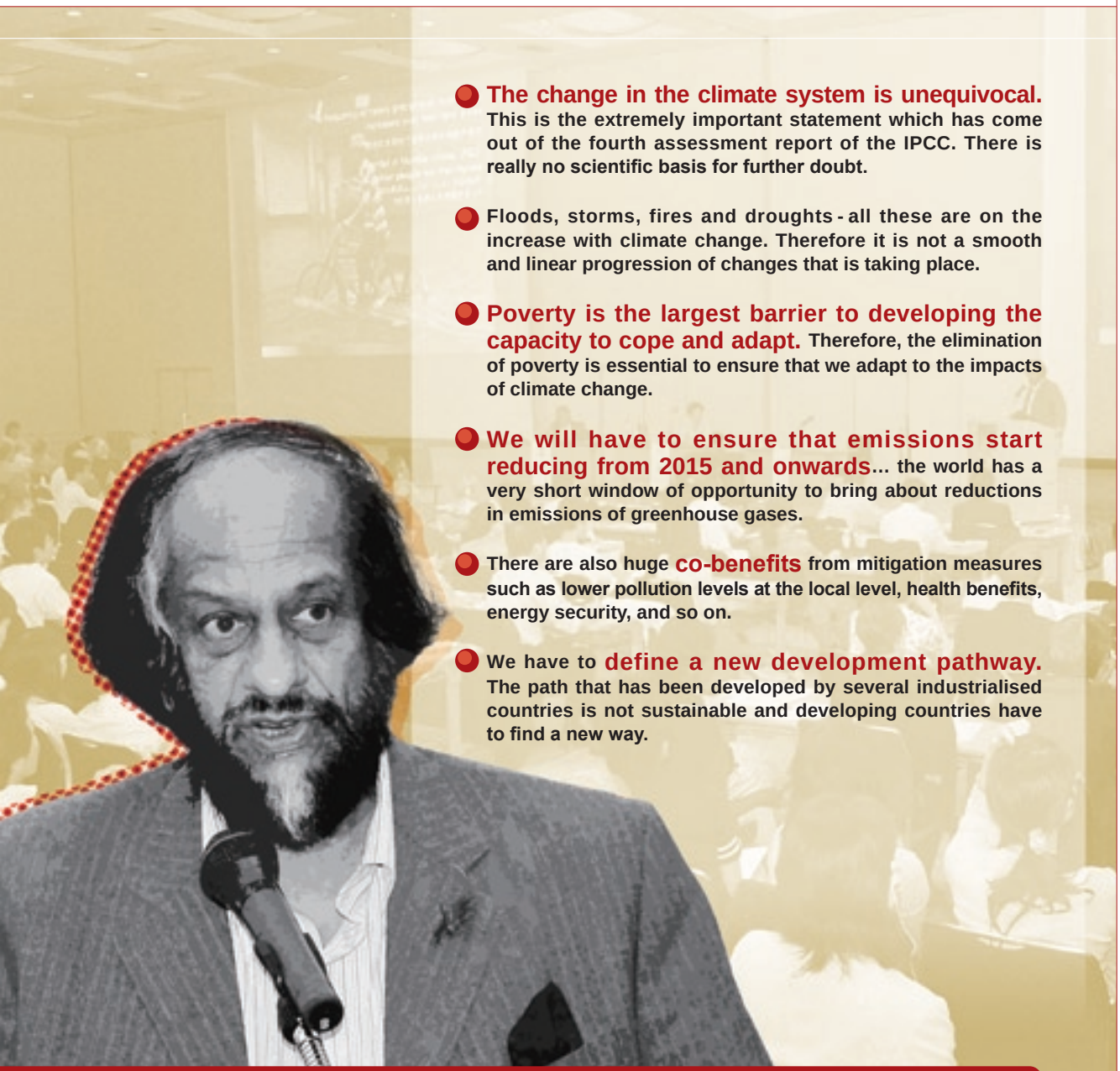
Greenhouse gas emissions from homes and offices are rising phenomenally. Japan has instituted an outstanding mechanism named the Top-runner Approach for home appliances, gas equipment, and other devices that is producing results, with extensive reductions and savings in energy use. But it is not enough for this equipment to be available; we must also persuade individual citizens to purchase high-efficiency equipment as replacements for older models. We must also take the Top-runner Approach to housing by promoting eco-friendly rebuilding and improvements. These are policies that I myself hope to put in place, and the internal LDP report that I mentioned earlier also states that these policies are to be implemented.

Mid and long term targets are required

As regards renewable energy sources, the Fukuda Vision commits to recapturing from Germany, which is now superseding us, the Japanese position as the world's leader in the penetration of solar power generation and touches on, in addition to the propagation and expansion of solar power generation, enlarging the obligations of the electric power utilities and other power producers to adopt renewable energy, as well as Green Certificates. These are other things that I think we have to work on.

To implement these schemes domestically, or with international society, will require targets. As also stated in the Fukuda Vision, the long-term target of reducing the current level of emissions by 60 to 80 % is applied to long-term targets for technological development. **For private enterprise to consider business plans and for individuals to plan their own behaviors, for them to act systematically, will require medium-term targets of greater predictability.** The year 2020 seems to me to be appropriate. One issue is at what level to do this, and the Prime Minister is talking about announcing the appropriate timing sometime next year. I expect this will be a crucial part of international negotiations going forward and so think it would be appropriate to announce the appropriate timing by COP15 next year.

I believe that **the fate of future generations, our descendants 10, 30, and 50 years from now, depends on what we do today about global warming.** Seen in this light, the task set for us is a tremendous one, and I consider it imperative that we act with urgency. It is important to achieve as large a reduction as possible and as soon as possible. If we all think this through together and act together, I think that we will find ourselves able to build a major capability to act on greenhouse gas reductions, that together we will able to create that sort of Japan, that sort of world. As one of those individuals, I myself will do as much as I possibly can.



- **The change in the climate system is unequivocal.** This is the extremely important statement which has come out of the fourth assessment report of the IPCC. There is really no scientific basis for further doubt.
- Floods, storms, fires and droughts - all these are on the increase with climate change. Therefore it is not a smooth and linear progression of changes that is taking place.
- **Poverty is the largest barrier to developing the capacity to cope and adapt.** Therefore, the elimination of poverty is essential to ensure that we adapt to the impacts of climate change.
- **We will have to ensure that emissions start reducing from 2015 and onwards...** the world has a very short window of opportunity to bring about reductions in emissions of greenhouse gases.
- There are also huge **co-benefits** from mitigation measures such as lower pollution levels at the local level, health benefits, energy security, and so on.
- We have to **define a new development pathway.** The path that has been developed by several industrialised countries is not sustainable and developing countries have to find a new way.

Strategy to Combat Climate Change in Asia and the Pacific —For the path of new development

Rajendra Pachauri

Chairman, Intergovernmental Panel on Climate Change (IPCC)

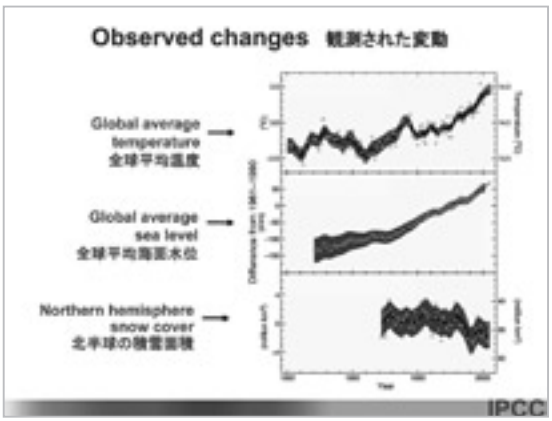
Profile

Dr. Rajendra Pachauri has been Chief Executive of TERI since 1981, currently serving as Director-General. In April 2002 he was elected as Chairman of the Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Peace Prize in 2007 along with former US Vice President Al Gore. He has been active in several international forums dealing with the subject of climate change and its policy dimensions. Dr. Pachauri was bestowed the “Officier De La Légion D’Honneur” by the Government of France in 2006. He was also conferred with the“ Padma Vibhushan”, the second highest civilian award, for his services in the field of science and engineering in January 2008 by the President of India. He also has been a membership of the Economic Advisory Council to the Prime Minister of India. He has Ph.D.s in Industrial Engineering and Economics.

Strategy to Combat Climate Change in Asia and the Pacific — For the path of new development

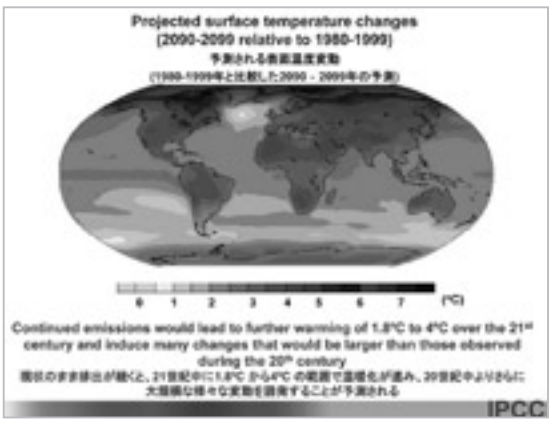
Rajendra Pachauri
Chairman, Intergovernmental Panel on Climate Change (IPCC)

The change in the climate system is unequivocal



Let me start with the extremely important statement which has come out of the fourth assessment report of the IPCC. The change in the climate system is unequivocal. There is really no scientific basis for further doubt. If we look at observation records, it is apparent that the climate of the earth is changing quite substantially. The top portion (of the figure – right) shows the average global temperature, which incidentally during the 20th century, increased by about 0.74 degrees Celsius. The ups and downs are evidence of the fact that both natural and human-induced factors are responsible for changes in the climate. But what is quite obvious is the sharp increase that has taken place in recent decades. It is the same in the case of sea level rise. As you observe here, you can see that it has been growing at a much more rapid rate in recent decades. Sea level rise during the 20th century has also recorded approximately a 17-centimeter increase on average. The last section that you see here indicates the decline in the northern hemisphere's snow cover. The largest area of land incidentally lies in the northern hemisphere. Therefore, what is of great relevance is the reduction in snow over this land area.

Increasing climate change impact



Climate change is not something smooth and linear. It is something which is accompanied by several disturbances. The frequency of heavy precipitation events has increased over most land areas. I do not want to draw a link between human-induced climate change and what is happening, for example, in the state of Iowa today where large areas of farmland and several cities and habitations have been completely covered by water as a result of flooding in the Mississippi River. We, in India, had a terrible occurrence in 2005 where the entire city of Mumbai came to a standstill and several people lost their lives as a result of very heavy rainfall over a 48-hour period.

Tropical cyclones have also increased in intensity over the past three decades. Cyclone Nargis which hit Myanmar in June led to the loss of over 100,000 lives and enormous damage. Here, I would like to highlight the fact that in this case, as a result of sea level rise, the amount of water that is available over the continental shelf which in a cyclone gets picked and hurled on-shore, was substantially larger because of sea level rise. Therefore, the severity of the impact of this cyclone was much higher than what a similar cyclone would have caused a hundred years ago.

IPCC has also come up with projections of future changes in temperature and have examined a number of scenarios. At the conservative end of the scenarios, we have come up with a best estimate of temperature increase of 1.8 degree Celsius; less conservative scenarios estimate this to be about 4 degrees Celsius. Even in conservative scenarios, this would represent a very serious threat to all living systems and certainly the human species and human habitation because 1.8 degrees added to the 0.74 that has taken place in the 20th century will put us in a range where some of the impacts of climate change could be very serious, if not disastrous.

The vulnerabilities in the Asia - Pacific region - Water damage, Disease, Food shortage & Water shortage

Let me just highlight some key vulnerabilities in the Asia-Pacific region. Coastal areas are particularly vulnerable, and in fact, we have identified the mega deltas in Asia as some of the most vulnerable regions in the world. Which are the mega deltas? They are Shanghai, Dhaka, and Calcutta. And, of course, the Nile delta is also an area which is very vulnerable. What happens is that these areas have very high population densities and a large amount of infrastructure and property. Therefore, in the event of coastal flooding as a result of sea level rise, a large number of people become vulnerable and are affected by their coastal location. Small islands are particularly threatened and this will certainly compromise the socio-economic wellbeing of island communities and states.

I was in New Zealand in June on World Environment Day and with me was the President of Kiribati. At every forum that we addressed jointly, he reiterated that by the end of this century the people in his country will have to evacuate the islands, if they even remain above sea level. That is a very serious threat. In the Pacific Islands, more than 50 percent of the population live within 1.5 kilometres of the shore, which makes them highly vulnerable. Infrastructure, such as airports and roads, are also located in those areas. Most small islands have limited water supply, and with sea level rise, the extent of salinity that goes on-shore becomes a very serious problem. Tourism will be affected by water shortages, warmer climate, beach erosion, and so on. Human health is also going to be impacted. Morbidity and mortality will increase due to diarrhoeal disease primarily associated with floods and droughts.

One of the biggest challenges in Myanmar now, of course, is to prevent disease. Because with the major flooding that is taking place, diseases are breaking out and that is a great threat. Toxicity of cholera is increasing, leading to increased deaths. There is more disease and injury

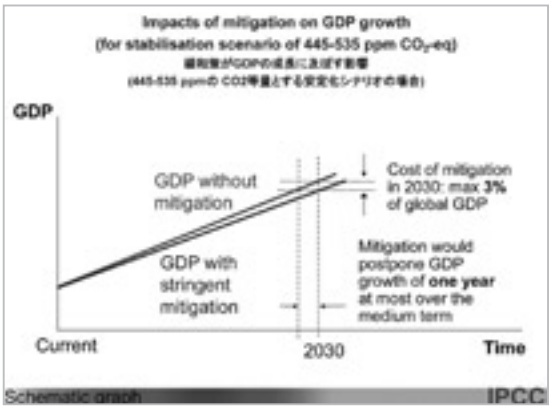
due to heat waves which are also increasing. **Floods, storms, fires, and droughts- all these are on the increase with climate change. Therefore as I said earlier, it is not a smooth and linear progression of changes that is taking place.**

Agriculture is particularly vulnerable. Crops yields could increase up to 20 percent in East and Southeast Asia, but they could decrease up to 30 percent in Central and South Asia by 2050. In fact, the recent evidence from research that is coming out seems to show that agriculture is going to be affected more adversely than has been estimated so far. Fish populations are being altered as a result of changes in climate. Therefore overall, the risk of hunger is projected to remain very high in several developing countries. Africa, where already you have a growing crisis, is going to get worse over time.

Water availability is decreasing in South Asia, in particular where large numbers of river systems originate in the northern glaciers. There is a deep concern that water supply in these rivers could decrease to a point where it would affect 500 million people. In China, there would be about 250 million people that would be affected. Decreasing winter precipitation over the Indian subcontinent is also leading to reduction in groundwater storage. Another issue that concerns all of Asia is saltwater intrusion, which is taking place particularly on-shore in the coastal areas. Overall, at least 120 million people and up to 1.2 billion will be facing increased water stress as a result of climate change.

Adaptation strategies and their limits

We have to adapt to the impacts of climate change. The key adaptation strategies are developing knowledge and integrating adaptation in wider economic policies. Disaster preparedness and warning is important. Improved healthcare systems and promoting good governance is also important and, of course, **poverty is the largest barrier to developing the capacity to cope and adapt. Therefore, the elimination of poverty is essential to ensure that we adapt to the impacts of climate change.**



Societies have a long record of adapting to the impacts of the weather and climate, but climate change is presenting new risks which require mitigation at the global level. Therefore, adaptation alone will not work. Incidentally, the cost of mitigation is not high at all. For instance, we have found that by 2030, the cost of stringent mitigation measures will not exceed more than three percent of the GDP for the world as a whole. But to bring that about **we will have to ensure that emissions start reducing from 2015 and onwards. Therefore, the world has a very short window of opportunity to bring about reductions in emissions of greenhouse gases.** We can allow emissions to increase up to 2015, but not beyond that.

Mitigation measures and co-benefits

This is what I say about the reduction of three percent in GDP, but **there are also huge co-benefits from mitigation measures such as lower pollution levels at the local level, health benefits, energy security, and so on.** In developing countries, I think we need to focus on those

issues that would promote sustainable development. Those incidentally will also bring about a reduction in the rate of growth of emissions of greenhouse gases. These are some of the key mitigation instruments: regulations and standards, energy infrastructure, research development and demonstration, changes in lifestyles and management practices, and a price on carbon. That means we need carbon price signals to bring about a shift towards the low-carbon economy.

The increased investment of 2.4 trillion US dollars will improve efficiency as estimated, but this can be offset by USD 3 trillion in terms of savings in supply investments. That means that if we were to invest in demand side management, we would offset and increase supply investments which certainly will save the world a lot of money. Renewable energy and clean power generation is also expected for future investment. I think we need carbon capture and storage because countries in this region are highly dependent on coal for power generation.

We need to promote equity in spreading the benefits that will arise from economic growth. We cannot have societies which have the extreme inequalities we see today. We have to ensure adequate food supply, and this requires some institutional responses. Overall, **we have to define a new development pathway. The path that has been developed by several industrialised countries is not sustainable and developing countries have to find a new way.**

Now I would like to talk about what Gandhi said. He was once asked if he expected India to attain the same standard of living as Britain. With his wisdom he responded, “It took Britain half the resources of the planet to achieve this prosperity. How many planets will a country like India require?” One small measure that we have implemented and are trying to promote is the Lighting a Billion Lives campaign. (Showing the video of the campaign)

Please join us in Lighting a Billion Lives. Thank you very much.

About “ Lighting a Billion Lives ”

Lighting a Billion Lives’ (LaBL) Campaign aims to bring light into the lives of one billion rural people by replacing the lanterns with solar lighting devices. The campaign is advocated by Dr. Pachauri, the Director General of The Energy and Resources Institute (TERI). It is estimated that a total of 1.6 billion people in the world lack access to electricity and the Campaign targets all communities across the world that lack access to modern and clean sources of lighting, started from the prevalence of rural people in India. The campaign allows individuals as well as organizations to join by sponsorship. Each solar lantern in its useful life of 10 years makes it possible to mitigate about 1.5 tons of CO_2, ensuring a healthy quality of life in rural areas in developing countries at the same time.

Discussion

(Moderator: Hirono)

Ms. Kawaguchi and Dr. Pachauri, thank you. You have both been instructive today. Ms. Kawaguchi described in very clear terms Prime Minister Fukuda's vision for action on global warming announced on the 9th June, the proposals put forward by the Mr. Okuda's round-table talks and the interim report of the LDP's global warming action committee published on the 11th June. Thank you.

Dr. Pachauri spoke on the issues of climate change that the world, and particularly the Asia-Pacific region, is facing and particularly on the primary vulnerabilities. Focusing further on coastal deltas, small island states, food production, water resources, and human health, his talk was illuminating with regard to adaptation and mitigation measures.

I would now like to put three questions each to today's speakers. My first question is for Ms. Kawaguchi. I expect that in the international regime for action on global warming after the Kyoto Protocol -- that is, post-2013 -- it will be of great importance for the three countries with the highest emissions -- America, China, and India -- to make progress in their national efforts towards reductions. I understand that the sector-specific approach is a Japanese initiative to involve developing countries, but I think that further dialogue will be needed to gain the understanding of developing countries.

Another extremely important question is how to set reduction targets. European countries have announced the extremely ambitious target of reduction of 20 % of 1990 levels by 2020.

The LDP assembly of which you are secretary general has published an interim report entitled "Towards Establishing a Cutting-edge Low-carbon Society: For Future Generations and the Earth". This report too offers the rather audacious proposal of setting a specific numerical target for 2020. The Fukuda Vision, however, states no such figure. Now, if Japan is to play a leading role in international negotiations, I expect that it will in fact be important to state a numerical medium-term target along these lines. I'd like to ask you to expand on this a bit more.

(Kawaguchi)

The question is what should be the level of a 2020 medium-term target, and I think that we need to announce it somewhere. I addressed the question of the level earlier, and I think it should be an adequate one because it is en route leading to the long-term reduction target for 2050 and the greater reduction we can achieve sooner, the better.

As to when we would announce it, I expect that the percentage reductions individual countries will make by around 2020 will be part of the outcome of negotiations on the coming international framework. So I expect it will be announced at an appropriate time somewhere in the course of the international negotiations.

One major task for Japan is to bring the countries with the highest emissions on side, so that's something to do. Another, at the same time, is to achieve the necessary adequate reductions. I think that these two objectives will influence the timing of the announcement to some extent.

(Moderator: Hirono)

I hope you will do want you can in this regard, especially as the LDP is part of the governing coalition. Next, I have a question for Dr. Pachauri.

Ms. Kawaguchi says that it is a necessity for the main developing countries to join in the efforts to make greenhouse gas reductions. If it were possible to adopt special reduction targets within an international framework, for example, with developing country participation, it may be possible to spur investment in clean technologies and measures to reduce air pollution. Greenhouse gas reductions and cleaner air would be entirely beneficial to the citizens of China, India and other developing countries. What then are your views on how India should adopt such a numerical reduction target in the post-Kyoto regime?

In other words, in what form should India adopt such a numerical target in order to promote its own national interest as well as the global interest? Also, what factors do you think will be necessary to guarantee that the major developing countries will participate effectively in greenhouse gas reductions in the post-Kyoto regime?

(Pachauri)

That's a complex question, but let me try to answer it. I think developing countries should promote a path of sustainable development. Because countries like China and India, in particular, have very large populations and if they develop along a path that is unsustainable, the impact would be felt by a very large number of people. But the reality is that, firstly, unfortunately, developed countries have not done what was expected of them since 1992. That has clearly eroded credibility and confidence in the global regime for bringing about reduction.

Secondly, I think the fact is that developing countries are trying to emulate what has been achieved

in the developed world. Therefore, you find that if SUVs are being sold in North America, those wretched products also come to India and China. There has been such an increase in the number of these kinds of vehicles. And finally, politically it is very difficult for any leader in China or India to tell people, “Look, the developed world is going to live in a different world altogether and you will have to go without light, cars and transport.” I think we really need to come together and ensure that we realise that we have only one planet. I think in that respect developed countries must set an example, and I am sure then that the developing world will follow. I see signs of change in both China and certainly in India.

(Moderator: Hirono)

Thank you. It seems reasonable to put it more or less that way. I think it's not only the people of Japan but also the people of many developing countries who need to accept this principle of "shared but distinct responsibilities", so I would say that's an extremely good point. Next, I have a question for Ms. Kawaguchi.

Britain and other European countries have actually introduced such measures as emissions trading and environmental taxes, and these are now having some effect. California, New York and many other American states -- although not the U.S. federal government -- have already concluded a co-operative pact with Norway, Canada and New Zealand to work towards the institution of a common emissions trading system. Although the Fukuda Vision does make some mention of this experiment in emissions trading and discusses environmental taxes in terms of green taxes, I think we need to see more detail on these.

At this point (June 2008), oil prices have been skyrocketing and the petrol price has shot over 180 yen per litre. The fact is that circumstances make it problematic to implement carbon pricing. That said, it seems to me that is no way around emissions trading and environmental taxes if we are to move forward with building a low-carbon society and taking effective action on warming. Could you address this?

(Kawaguchi)

The price of oil is up tremendously now and has had a massive impact on the Japanese economy, not least road haulage, and last week fishing boats suspended operations. Just last week, the weekend before last, I was in Malaysia and I found it striking how even a country with such abundant resources as Malaysia was affected.

In that sense, it seems to be a fact that rising energy prices have a massive short-term impact throughout the economy. At the same time, however, I think it's important for us to set our sights on 2050 and for society as a whole to change the framework to accommodate the construction of a cutting-edge low-carbon society. Environmental taxes would be one economic tool, and one way of looking at the temporary tax earmarked for road improvements is that it in fact attaches a price to carbon, making carbon more expensive.

I expect a debate on the Japanese tax system to begin as of this autumn. That debate is going to be one about shifting road-use revenue to the

general budget. Payments of temporary tax have in the past been made for the purpose of roads; it's a tax that's been levied for that purpose and that is what we'll be debating, and in that context, I think we have to discuss what to do about temporary tax and who we are going to ask to bear the cost for the sake of the environment.

There is talk of "greening of taxes" in order to build a low-carbon society, and there are all sorts of taxes -- car ownership tax, for example, automobile tonnage tax, and many other taxes -- and we need a debate how to incorporate the carbon perspective into our taxes. And I think that naturally brings us on course for a debate on what to do about environmental taxes. My personal opinion is that we need to think generally about greening of taxes, and at the same time, because emissions trading will apply only to certain industries, I think this is going to require a debate on environmental taxes as supplementary levies with a view to containing office and household emissions.

(Moderator: Hirono)

As you are all aware, the Central Environmental Council has for some time been discussing the introduction of environmental taxes but has of course met with opposition from different quarters, so this is where we've ended up, with by no means sufficient discussion on the matter. In recent reportage and television broadcasts about global warming, the public is gradually exhibiting some degree of understanding regarding the introduction of environmental taxes. And people are talking about it even in some business circles, so I am not entirely pessimistic. I hope you will do what you can on this.

I would like to put a question to Chairman Pachauri now. I think what Ms. Kawaguchi is saying is that the skyrocketing oil price is an opportunity for all countries now to introduce market mechanisms as a way of taking action on global warming. The IPCC report also indicates that we should encourage investment in this area and direct funds towards environmentally friendly technologies and companies with high energy efficiency.

How about developing countries? Are developing countries themselves taking more positive steps towards the introduction of market mechanisms? Also, are they shifting towards such economic means as emissions trading and carbon taxes? Is India one of the countries moving towards the introduction of such market mechanisms?

(Pachauri)

Firstly, I must say that I agree entirely with Madame Kawaguchi about the importance of green taxes and greening the whole fiscal system. In fact, if you listen to what Al Gore says, he says we should get rid of income taxes and replace it with carbon tax. Therefore, the government gets the revenues that it wants but it is based on the use, and therefore the emissions, of carbon dioxide. As far as developing countries are concerned, this is an opportunity. But unfortunately, there are not too many options that are available. If we were to tax coal, the question is what is one going to use for power generation? Nuclear is not an option for every country in the world. Unfortunately since 1985 when oil prices crashed, research and development expenditure worldwide on energy in

general has gone down. However, I feel, and I have myself been propagating this in India, that we have to start taxing some of these products and fuels. As a result, not entirely because of my or my colleagues' efforts, the finance minister has changed the rate of excise taxes on motor vehicles just in the last month. Bigger vehicles are now going to be taxed at a higher rate than smaller vehicles. Similarly, even though inflation is going up, the government has had no choice but to increase taxes on petroleum products. I agree entirely with Madame Kawaguchi. This is a remarkable opportunity where we can rationalise some of our taxation on fuels and move towards low-carbon fuels. This also means that we have to provide incentives to renewable energy and low-carbon forms of energy production and consumption. I think we have to move in that direction.

(Moderator: Hirono)

Thank you. I actually visited New Delhi recently and they had made new progress in their underground railway at the time. I think one factor in that was financing from such sources as the Japan Bank for International Cooperation. I actually had the chance to speak with the mayor of Delhi City, who explained that construction proceeded neatly according to schedule and was actually somewhat ahead of schedule. What is more, the project came in under budget. It made me tremendously happy that Japan was able to make something of a contribution.

This year, IGES celebrates its 10th anniversary and today's symposium is being held to mark that landmark. As was announced this morning, last month's conference of G8 Environment Ministers in Kobe agreed on the formation of a network of research facilities to promote the achievement of a low-carbon society. Given this agreement, what do you expect from IGES over the next ten years? And, somewhat tongue in cheek, what numerical targets should the organisation work towards?

(Kawaguchi)

I have great expectations of IGES. I very much hope that Japan's IGES will be the lead agency in the network of international think tanks that was mentioned. What I hope is for IGES to be proactive, to engage with and work on issues that others haven't taken up yet, and to do creative research.

I think that in Japan today, it is the ministry bureaucrats that make up the biggest policy think tank. Not infrequently, these bureaucrats monopolise information and use that position to make policy. I think that the sound development of Japan will require competition with policy drafted by government authorities. For this to happen, it will be extremely important to disclose the information that government authorities hold. There is now quite a lot that we can debate with information that is publicly available. Rather than vindicating the past as we consider our next policy step along the present course, I think we need to approach policy from different perspectives and this is where I

would like to see IGES play a role. As for a numerical target, IGES should be aiming to be number one.

(Moderator: Hirono)

Thank you for the very positive remarks.
I would like to ask Dr. Pachauri the same question.

(Pachauri)

I think this is a moment when you need an unprecedented level of knowledge to move every society towards a low-carbon future. I would submit that as a very concrete suggestion. I would like to get into a project with IGES and with my institute by which both countries can start looking at how we can create a low-carbon future. We can learn a lot from Japan in terms of technology and its dissemination. Maybe there are a few things that Japan could also learn from us.

But more importantly, I think it would be good intellectually for IGES to get into this kind of activity because, after all, it is an international organisation. It has a focus on Asia. In my institute, we have just started a similar project with China. We have set up the India Council for Sustainable Development to launch a project with the China Council for International Cooperation on environment and development. We are organising a symposium later this year. I think we could do something similar with Japan. I would have suggested this to Professor Hamanaka, but I have not yet discussed it with him, and I am already saying this in public. But since you have asked me this provocative question, Professor Hirono, the answer that comes to mind is that we can get into a joint activity which can then be disseminated to the public and to the government. I think there would be some benefits from that.

(Moderator: Hirono)

Thank you for a wonderfully clear answer.
I'd like to ask each of them to leave us with a short closing message.

(Pachauri)

I think the world has very little time. I think each one of us has to really do our very best, and I expect a lot of Japan because Japan is a leader in technology. Japan is a society with conscience. It has cultural and traditional values that I personally respect and I think the rest of the world respects. We have very little time and we really have to work together. I think that if in the next few years we can bring about change in our respective societies, maybe our children and grandchildren, as Al Gore says--and you know I have spent a fair amount of time with him recently—will not say that

those generations did nothing. They would ask how is it that we had the courage and the wisdom to do what we did. I think that is what we need.

(Kawaguchi)

Television and radio have offered much reportage on global warming recently, and it seems to me that all of Japan has taken an interest in it. This is of course entirely welcome, but in my time as Environment Minister and during the time I've spent on environmental issues, I think the Japanese in Japan have divided into more or less into two groups: activists with a keen interest in the environment, and people who don't care at all. People attending this symposium are of the former group it seems, people with a deep interest in the environment who think about what it is we need to do.

I think that a great challenge as we get to work on building a low-carbon society will be how we can possibly bring these two groups together, how we can bring the latter group of people entirely uninterested in the environment around to taking an interest in and acting on behalf of the environment. If anyone has any insights into this, I really do wish -- and have for a long time now -- you would let us know about them.

It seems we still have a bit of time, so I'd like to make one more point. I know that a lot of people think that achieving a low-carbon society is going to be a tremendous headache, more trouble than it's worth. What is important is that we all act together and share the burden. Team Minus 6% is one example, and I expect most of the people here today are members. If you join Team Minus 6%, you don't actually put yourself to any great trouble. I'd like to say that this should be an opportunity for Japan. It's time for everyone to understand it as an excellent opportunity to raise our international profile and enhance the international competitiveness of our industries, and especially for people in industry to understand this opportunity and to act on it.

(Moderator: Hirono)

Thank you.

Panel Discussion:

Climate Challenge for Asia and the Pacific

Hironori Hamanaka (Moderator)
Akio Morishima
Nay Htun
Hans-Jochen Luhmann
Shigeru Mochida

Panel Discussion:
Climate Challenge for Asia and the Pacific

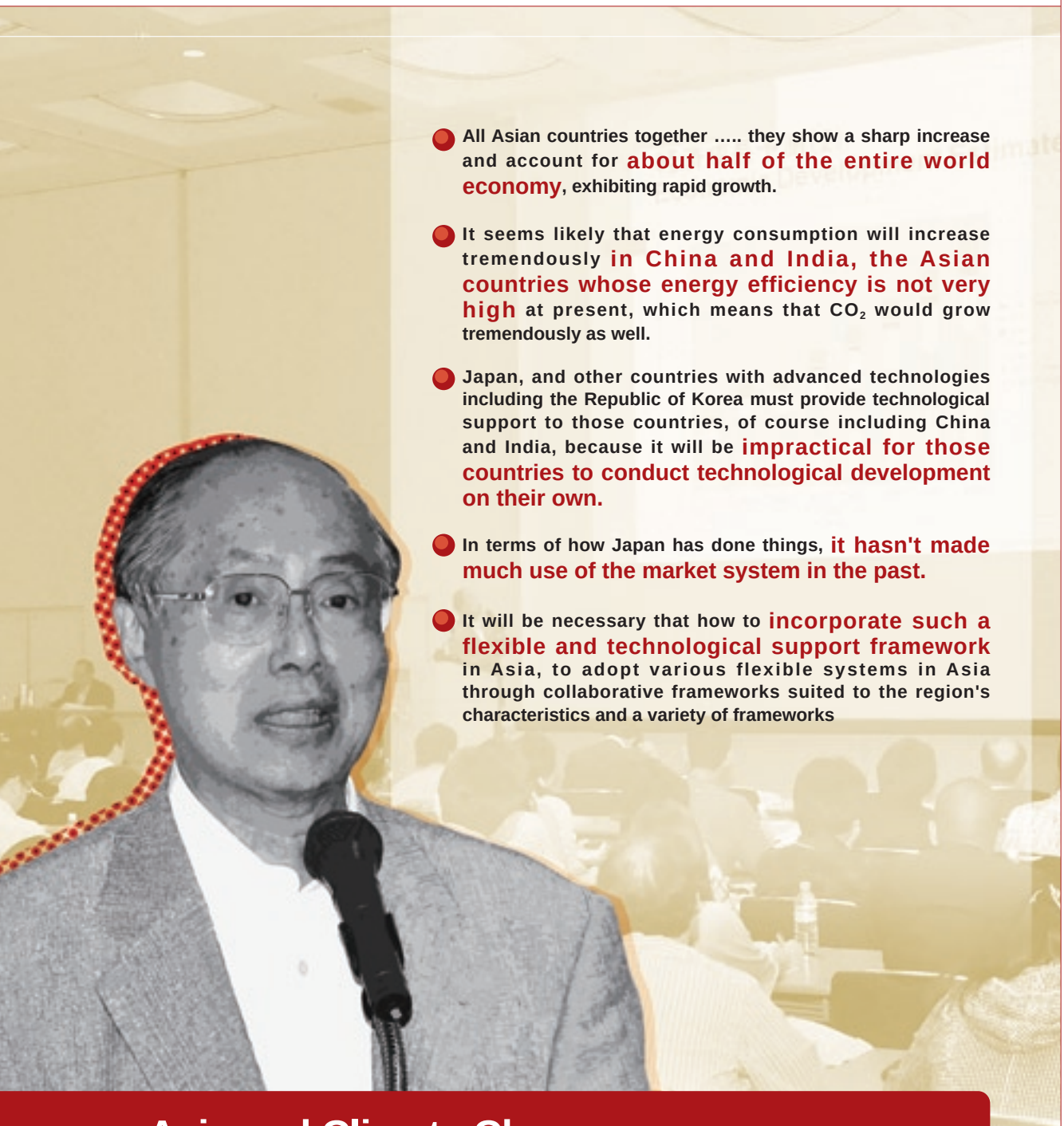
Moderator

Hironori Hamanaka
Chair of the Board of Directors, IGES

(Abstraction from the summary of the panel discussion)
We have heard a wealth of varied discussion today, so it is not easy to sum up. What can be said, is that urgent efforts must be made to deal with global warming, and that it is necessary to make fundamental changes in our economic and social systems as well as in our values and actions. There was a call for a paradigm shift and we heard about how the experiences of Europe and Japan could be put to practical use in the transformation of such actions.
I believe that such organisations as the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) could play a vital role in this regard. It is quite important that those UN organisations, through providing information and opportunities for dialogue, will help exchange information and experiences, so that opinions can be shared on how to proceed and consensus can be reached.

Profile

Prof. Hironori Hamanaka is professor at Keio University. Before joining Keio University, he was the Vice-Minister for Global Environmental Affairs at the Ministry of the Environment. He served with the Government of Japan for more than 35 years, mostly in the field of environmental policies, before he left in 2004. Over the last 9 years, he has devoted his administrative career to intergovernmental negotiations in areas including the Kyoto Protocol and its implementing rules, major agreements in the field of sustainable development, such as the Johannesburg Plan of Implementation agreed at the World Summit on Sustainable Development in 2002, and the development of national policies to implement international agreements, most notably the Kyoto Protocol. Based on his professional career, he was elected and serves as a Co-chair of the Compliance Committee under the Kyoto Protocol and the Chair of its Facilitative Branch. He has held his present position since April 2007.



- All Asian countries together ..... they show a sharp increase and account for **about half of the entire world economy**, exhibiting rapid growth.
- It seems likely that energy consumption will increase tremendously **in China and India, the Asian countries whose energy efficiency is not very high** at present, which means that CO_2 would grow tremendously as well.
- Japan, and other countries with advanced technologies including the Republic of Korea must provide technological support to those countries, of course including China and India, because it will be **impractical for those countries to conduct technological development on their own.**
- In terms of how Japan has done things, **it hasn't made much use of the market system in the past.**
- It will be necessary that how to **incorporate such a flexible and technological support framework** in Asia, to adopt various flexible systems in Asia through collaborative frameworks suited to the region's characteristics and a variety of frameworks

Asia and Climate Change

Akio Morishima
Special Research Advisor, IGES

Profile

Prof. Akio Morishima graduated from the University of Tokyo School of Law and the Harvard Law School and is the former president of the Central Environment Council, Japan. He served as professor at Nagoya University and Sophia University, Japan. Since 1993 he has also been involved in the Central Environment Council of Japan as the Chairman of the Policy Planning Committee, and he served as President of the Council from 2000 to 2005. For nine years from 1998, he served as the first Chair of the Board of Directors at IGES. He is currently serving as the Special Research Advisor for IGES and the Chair of the Board of Directors of the Japan Climate Policy Center.

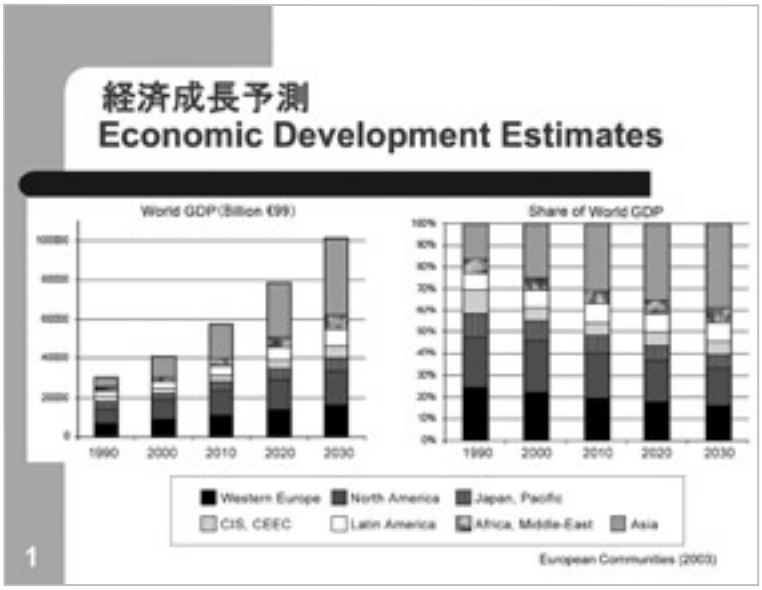
Asia and Climate Change

Akio Morishima
Special Research Advisor, IGES

Our topic today is Asia and the issue of climate change. In terms of how Japan can contribute on this issue, I would like to focus on the question of what sort of policy challenges climate change poses for Asia.

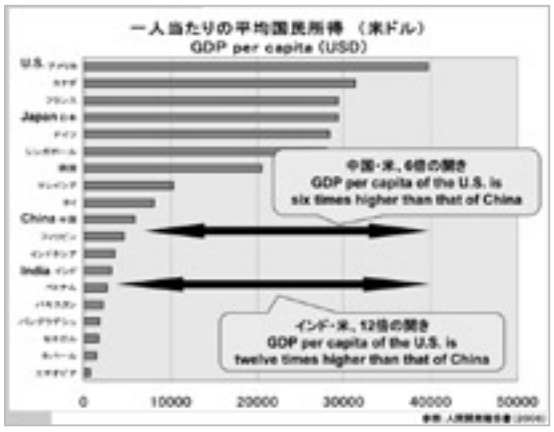
Economic growth in Asia

Looking at past economic growth in Asia and forecasting it into the future, it can be expressed as a percentage of the world economy. First, in 1990 it's less than 20%, and within ten years it surpasses 20%.



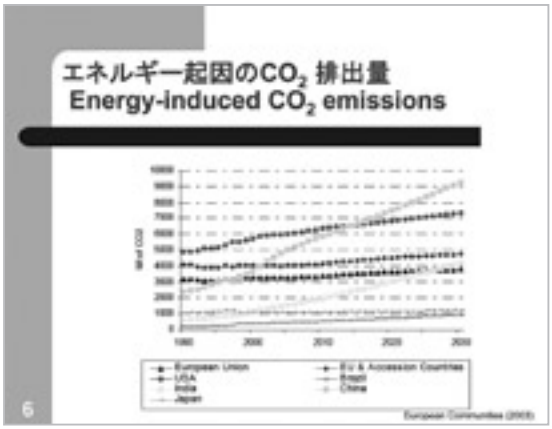
The figures for 2030 are forecasts, but they take the Asian region to 40%. The figures for Japan and the others gradually become lower, but **together they show a sharp increase and account for about half of the entire world economy, exhibiting rapid growth.**

Let's look at the same thing at the national level. Asia is experiencing high economic growth. Above all, China and India have achieved extremely high growth these past 20 years, and it will continue to be extremely high over the next 20 to 30 years as well. They are forecast to experience high growth even over the next 50 years.



Despite this, when we look at per capita numbers 2005 figures, China is at one-sixth and India at one-twelfth of the American level. The Chinese and Indian economies remain extremely small in per capita terms when compared with the developed countries, and particularly with the United States.

Next, let's consider past and future economic growth in terms of energy. In terms of energy Japan does not grow much overall, whereas China and India have grown a great deal. The figures for 1990, 2010 and then 2030 indicate that they will experience extremely high growth.



As we consider CO_2 emissions looking at China and India since 1990 and 2004, there will be even further growth by 2030. There is extremely high growth in CO_2 relative to energy consumption. This means that energy efficiency is poor, so there is more CO_2 emitted burning the same amount of oil or coal, for example.

Other countries are a slightly up, but they haven't used much energy. Thus, Asian energy consumption overall is going to rise, and this means CO_2 is also going to rise. In particular, **it seems likely that energy consumption will increase tremendously in China and India, the Asian countries whose energy efficiency is not very high at present, which means that CO_2 would grow tremendously as well.**

Challenges of Asia

And the impact of global warming on Asia is extremely severe. Not only will Asia be emitting CO_2 if we keep on this way through to around 2050, but global warming will also have a tremendous impact on sea levels, on health, on foodstuffs and on ecologies.

Asia is experiencing extremely rapid economic growth, as we saw earlier, but is faced with the major problem of still requiring poverty alleviation. This is what Dr. Pachauri told us earlier. Now, Asia in general and Viet Nam, Bangladesh and Nepal in particular will still need economic growth in the future. And they will need to use energy to do this. The option of renewable energy sources costs money, so the quickest solution would seem to be to just use low-priced oil which produces the most CO_2.

アジアにおける温暖化の主な影響予測
Estimated Key Impacts in Asia by Global Warming

Category	Key Impacts
Agriculture	□ 30% decline of crop production by 2050, resulting in a higher rate of starvation in south Asia
Water	□ Disappearance of glacier in the Tibetan Plateau by 4 km due to the increase of air temperature by 3 degrees. □ Yearly water supply of India will decrease from 1820m³ to 1140m³ by 2050, affecting 1 hundred million people of India.
Health	□ Increase in rates of outbreak of Cholera in south Asia and of diarrhea across Asia.
Costal/ Marine/ Ecology	□ Disappearance of 2500 km2 of Mangrove forests due to 1 meter Sea-level rise □ Higher risk of floods in 5000 km2 watershed of Red River Delta and 15-20,000 km2 watershed of Mekong River □ Disappearance of Coral reef by 30% in Asia in next 30 years

Source: IPCC, 2007

However, it is not quite true to say that they have the technologies to curb the resulting CO_2 emissions. They haven't necessarily got technologies to the levels where they can develop their own new energy sources or renewable energy. This means that the developed countries, particularly in the case of Asia **Japan and other countries with advanced technologies including the Republic of Korea, must provide technological support to those countries, of course including China and India, because it**

will be impractical for those countries to conduct technological development on their own.

Not only that, it will also be financially difficult to propagate them. And that is why we have to upgrade our existing energy-saving technologies. We must provide technological support, we must transfer technologies and we must provide financial support for technology transfer and propagation.

Japan's role in Asia

In terms of how Japan has done things, it hasn't made much use of the market system in the past, if you think about it. As Ms. Kawaguchi mentioned, it's something we're looking at doing now. What we've mainly done in Japan is voluntary efforts by Nippon Keidanren and the like. They voluntarily have made efforts to reduce CO_2 emissions, and the regulatory method we employed was "Top-runner" approach which has meant a focus on technology. We are looking at broad energy savings from technology and also doing energy conversion going forward. Aside from that, we're also thinking of using sequestration and the Kyoto mechanism.

So, in these methods looking to Nippon Keidanren and civic movements, we haven't made use of the economic methods of environmental taxes and emissions trading. We haven't made use of what's called pricing.

So what does that Japanese experience mean for Asia? What Japan has been doing gives us quite a lot of technical information and information on different, flexible approaches. As we have technical information and scientific information in particular, we can share that information and our experience of policy approaches. As Dr. Pachauri mentioned, we should be able to share this with developing countries and provide it to them.

Now, actually offering technology doesn't mean anything if you just hand out the technology. It is critical for developing countries to have funds to introduce technologies. Japan is currently capable of institutionally using an improved CDM or the ODA of the Fukuda Vision, so we should be able to do technology transfers and provide financial support in those forms.

As to the question of **how to incorporate such a flexible and technological support framework in Asia, it will be necessary, going forward, to adopt various flexible systems in Asia through collaborative frameworks** suited to the region's characteristics and a variety of frameworks mostly with Japan in the lead -- not that Japan needs to take the lead in anything and everything, as bilateral and multilateral efforts will be needed, and examples of these would include the APFED, the secretariat of which is handled by IGES and also ECOASIA. Thank you very much.

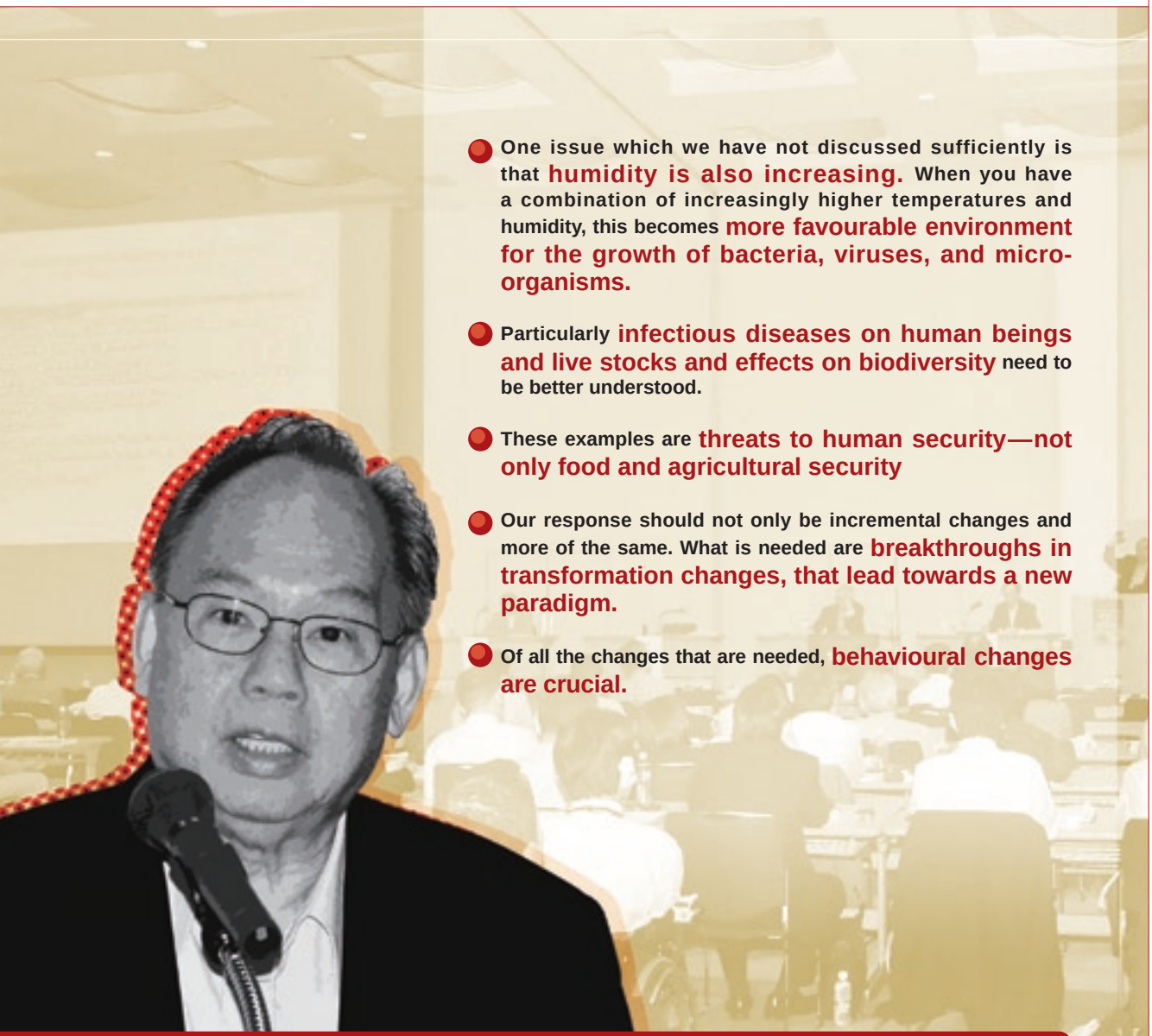
< Question & Answer Session >

Q1. In the presentation by Dr. Luhmann, he never quite finished telling us how the EU came to introduce emissions trading during the 1990s instead of environmental taxes. Could you tell us something more about the reasons behind that decision?

A. As I add some comments to the question, taxation is a sovereign matter for individual states and so cannot be determined only by an EU Commission directive. It's a matter that requires the agreement of all states, so the EU Commission alone is unable to impose environmental taxes throughout the EU. Emissions trading, however, is something that the EU Commission does have the authority to introduce as a system for the whole of EU. The problem is under the authority of the EU Commission, and ultimately the EU Commission gave up on implementing uniform environmental taxation which is a question of individual state sovereignty.

Q2. Should policy on population reduction not be considered as part of an integrative approach to climate change policy?

A. About the population issue, China restricts its population by means of a state law, for example, and India does not. How do we handle this issue at IGES? Certainly we are aware that the population issue is an important element of various environmental problems, but treating population as a policy issue entails considerable ethical and religious questions, so although we can point to it as a problem, I rather think it exceeds the brief of a research organisation to suggest certain policies for it. The stance that IGES has adopted is to go no further than to point out that the population problem brings these other problems on the environment.



- One issue which we have not discussed sufficiently is that **humidity is also increasing.** When you have a combination of increasingly higher temperatures and humidity, this becomes **more favourable environment for the growth of bacteria, viruses, and micro-organisms.**
- Particularly **infectious diseases on human beings and live stocks and effects on biodiversity** need to be better understood.
- These examples are **threats to human security—not only food and agricultural security**
- Our response should not only be incremental changes and more of the same. What is needed are **breakthroughs in transformation changes, that lead towards a new paradigm.**
- Of all the changes that are needed, **behavioural changes are crucial.**

Strategies to Combat Climate Change in Asia and The Pacific

Nay Htun

State University of New York, Stony Brook

Profile

Prof. Nay Htun graduated with a Ph.D. in Chemical Engineering from Imperial College, London. Prior to joining the UN, he was Department Manager with Exxon Thailand. He worked for UN over 25 years. He was formerly with the UNEP and UNDP where he held the rank of UN Assistant Secretary General at both organisations. At UNEP he held a number of positions including Deputy Executive Director and Regional Director for Asia Pacific and at UNDP he was Regional Director for Asia Pacific, responsible for 24 Country Offices. He was seconded to the UNCED Secretariat, Geneva, Switzerland where he was the Program Director and Special Advisor and helped organise the 1992 Rio Earth Summit. Currently he is a Fellow and Visiting Professor at the Centre for Environmental Policy, Imperial College London, and is also Visiting Professor, Senior Advisor at Lund University, Sweden. He is a Member of the Board of a number of non-profit organisations, including IGES and the International Research Institute for Climate and Society, Columbia University, New York. There are many publications about Environment and Sustainable development which are written and contributed by him.

Strategies to Combat Climate Change in Asia and The Pacific

Nay Htun
State University of New York, Stony Brook

The excellent sessions today have addressed and covered many of the important issues relating to climate change. I have little more to add, but what I would like to do is highlight some of the major issues.

Three critical aspects in Asia and the Pacific

Six out of the ten most populous countries in the world are in Asia and the Pacific. There are three critical aspects in respect of climate change.

First, most of the mega cities of over ten million people are on the coast. Second, 30 to 40 percent of the population, particularly in developing countries, are under the age of 15 years and more and more people are moving to the coast. Third, Asia and the Pacific is an aging society. So we have more people that are living longer, which is excellent, but we also have very large populations that are under the age of 15. With sea level rise, more cyclones, extreme weather and other natural disasters, people living in coastal areas will be increasingly affected, with potentially significant, social, economic, ecological and political consequences.

The risk of humidity increasing

There is a confluence of economic and social development, environment, and climate change. This convergence has profound implications. Climate is changing and global mean temperature is increasing as the chairman of IPCC, Dr. Pachauri, has already illustrated with the IPCC graph.

One issue which we have not discussed sufficiently is that humidity is also increasing. When you have a combination of increasingly higher temperatures and humidity, this becomes more favourable environment for the growth of bacteria, viruses, and micro-organisms. Transport mechanisms, for example, through atmospheric brown clouds can move these micro-organisms from one region to the other. I was a part of a group of 11 to 12 authors that prepared a report for UNEP on the health impacts of atmospheric brown clouds.

There is increasing evidence of more alien-invasive species, not only the fauna and flora but also micro-organisms. This has very serious implications for human health, wellbeing, and ecosystems.

Another route for alien invasive species is ballast water discharge into the marine ecosystem. The role of alien invasive species in diseases, **particularly infectious diseases on human beings and livestock, and effects on biodiversity need to be**

better understood.

Threats to human security

The G8 Summit will take place next month in Hokkaido. In the communiqué of the 2006 G8 Summit in St. Petersburg, the first paragraph was about infectious diseases and how this will affect not only the Millennium Development Goals, and that it is also one of the biggest challenges confronting economic and human development.

Some dots of evidence are emerging on climate and ecosystem changes and health. These dots are from studies from an increasingly broad range of multi disciplines.

The examples include: Colony Collapse Disorder (CCD). Honey bees in the United States and in Europe are disappearing with serious implications for agriculture. United States agriculture is estimated to be losing annually USD 20 to 25 billion because there are not enough bees to pollinate. And three out of the five Pacific salmon species have been wiped out and two are endangered because of sea lice and environmental stresses. Frog populations in many countries, are disappearing due to a disease caused by fungus. This fungus proliferates in high temperatures and humidity.

These examples are threats to human security—not only food and agricultural security Climate change is contributing to the increase in disease, disasters, destruction, and environmental refugee. It is estimated that there are currently about 25 million environmental refugees. However, if displaced persons within a country are taken into account, the number of affected people will be many orders of magnitude larger. The social and economic effects and insecurity, faced by people displaced from their homes due to climate events, even for brief periods, are traumatic.

Transformation changes that lead towards a new paradigm

What are the response options? It cannot be business-as-usual, as Dr. Pachauri and Madame Kawaguchi have stated. Other colleagues have also said the same thing. **Our response should not only be incremental changes and more of the same. What being needed are breakthrough transformation changes, that lead towards a new paradigm.** New paradigms for technological innovations, normative means, economic instruments, education, institutions, partnerships and governance, all contributing to paradigm changes in consumption and production patterns. Japan is showing leadership in moving towards a low-carbon society. Production systems and consumption patterns need to be addressed together. The two are correlated.

There are some very exciting paradigm changes and breakthrough technologies taking place. One area in which I am beginning to be more interested in is biomimetics. It is mimicking nature. A whole new world of materials, systems and functions are emerging that are much less material and energy intensive and are in harmony with nature. Another breakthrough technology is the invention, development and use of nanofibers for filteration and desalination, patented by a group of Stony

Brook University colleagues. This technology is proving to be very efficient and cost effective

There is an imperative need for transformational changes in education. We need to change our curricula, teaching methods and educational systems to have the human resources available to meet the momentous changes that are occurring. There is a saying in this part of the world that if we want to sustain ourselves for one year, we plant rice. If we want to sustain for ten years, we grow trees. If we want to sustain for 100 years and more, we educate and train towards a sustainable and low-carbon society.

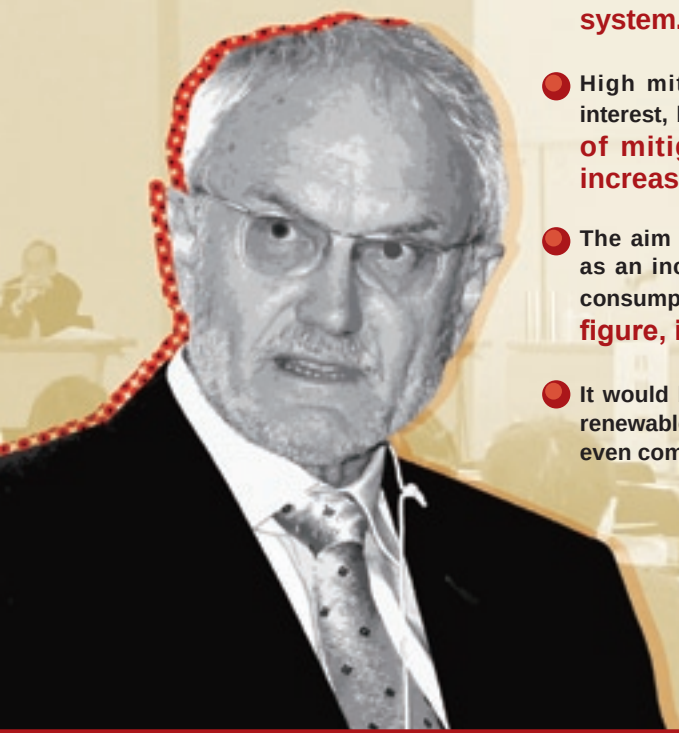
Finally and in conclusion, **of all the changes that are needed, behavioural changes are crucial.** We need to think and act outside the box. We must reinforce and renew the fundamental values that are in all of us, no matter where we come from, of caring, sharing, respect, harmony, and peace with our neighbours, with ourselves and with nature, for a safe, secure, prosperous and harmonious society.
I thank you very much.

< Questions & Answers Session >

Q. Should policy on population reduction not be considered as part of an integrative approach to climate change policy?

A. Clearly paradigm changes are needed in many aspects. I am personally doubtful whether a paradigm shift or change in policy with regards to population reduction can be implemented because of ethical, social, political and religious reasons. When we talk about population numbers, we must also relate it to consumption patterns. When one particular region of the world is consuming 80 to 100 times more energy and resources than a counterpart in another country, there is a lot of disparity. We have to look at consumption patterns that are less wasteful.

Finally, Malthus was quoted (by questioner).There is a book written about ten to fifteen years ago called the *Ultimate Resource*. The ultimate resource is the human being. This is the most valuable resource. We must see how we can make use of the best capability and ingenuity of human beings. Population reduction policies (and this term is never used) are never proposed in the international area.



- The three items which Europe put in one package are **climate, energy and competitiveness.**
- The regional system will, step by step, develop into a system of wider scope – perhaps **one day to a true 'global' system.** That is due to the built-in positive feedback feature.
- High mitigation aims for themselves are now in their interest, because **with increasing percentage points of mitigation, the investment flow induced is increasing overproportionally.**
- The aim of the EU Renewables Directive is rather defined as an increase of the share of renewables in final energy consumption, **from currently about 8 % to a future figure, in 2020, of 20 %.**
- It would be **obviously highly inefficient** to develop a renewables (investment) promoting system along the lines of even commitments per country to invest on its own territory.

A View from Europe:

How to Get to a Global Emissions Trading System as well as to a System to Enhance the Contribution of Energy from Renewable Sources Introduction

Hans-Jochen Luhmann

Project Leader for General Affairs, Wuppertal Institute for Climate, Environment and Energy, attached to Research Group 1

Profile

A Project Leader for General Affairs, Wuppertal Institute for Climate, Environment and Energy, attached to Research Group 1. His main fields of interest and work at the Wuppertal Institute are: Economic instruments, especially with regard to climate policy (Ecological Tax Reform; Joint Implementation); Multilateral environmental and tax/finance regime development; Social learning in reaction to the detection and public awareness of environmental concern; and Risk assessment and developments in making the precautionary principle operational. He joined the Wuppertal Institute in 1993 as a Deputy Director, Climate Policy Division. Prior to joining the Wuppertal Institute, he was head of the Department of Economics and Legal Affairs at Fichtner Consulting Engineers. He also served as the Program Director at the German Protestant Church Gathering, and was a member of the Working Group on Environment, Society and Energy at the University of Essen. He earned an economics Ph.D. with a thesis on "Energy Conservation by Increasing Decentralized Allocation of Capital, especially in the Residential Sector" from the University of Essen.

A View from Europe:

How to Get to a Global Emissions Trading System as well as to a System to Enhance the Contribution of Energy from Renewable Sources Introduction

Hans-Jochen Luhmann

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I would like to talk about the subject of our panel discussion which is the challenge imposed by anthropogenic climate change on one specific region, i.e. Asia and the Pacific. But climate change is a challenge common to all of us. Nevertheless, it is obvious: The world is divided into two parts, or two camps – I have been asked to speak from the view of one of those camps, which may be usual for industrialised countries. To overcome the risk of a sterile discussion setting, I decided to switch to a much more regional view – to speak as a European citizen. This restriction to a regional view offers the chance to draw analogies for the Asia-Pacific region.

The question and its implicit assumptions

The question which has been offered to me is: "How to get to a global emissions trading system as well as to a system to enhance the contribution of energy from renewable sources?" I should also have in mind that you are looking for policy options for the region you are living in and for which you are obliged to take responsibility. Having listened carefully to both questions, it seems to me, that there are two implicit convictions. If I may be allowed, I would like to make them explicit. First: Climate Change is a common challenge – consequently it deserves a common solution, at least a common approach towards a solution. Common commitment is the prerequisite for any success.. Second: There is one ultimate goal for all our efforts, i.e. reducing the risk connected with the climate change issue.

Main messages

Given these two basic convictions, my main message to you here may be somewhat astonishing. It is first: The approach the European Union decided to take in tackling climate change is, first and foremost, a regional, unilateral one; Europe wants to go ahead – my continent is no longer glued to the fear that a forerunner-role will be harmful due to uneven conditions in interregional competition. Europe did overcome the US's numbness in saying 'Only if China …, then the United States will …'. To put it in legal terms used in the climate change treaty: The "differentiation of responsibilities" is no longer perceived as – potentially – detrimental in global competition. It is rather the opposite view, which is revealed to be true – at least for industrialised countries. It is mainly a consequence of economic considerations. What has been decisive for the switch of the general view is the role of innovation and technological investment' *vis* a *vis* the fact of cost differences between regions. The approach the European Union decided to take in tackling climate change is, secondly, an approach not really focussed on climate change or on GHG mitigation; rather, it is a multi-dimensional one. It is an approach focussing on three aims in one approach.

The 'mathematics' of building a package

Before I switch to more details on the specific subjects Europe decided to put in one package, let us

stop for a moment and have a look at the consequences which such a multi-dimensional approach implies *per se*. I am a trained economist. If I were thinking as an economist only, I would blame the European policy makers. My first criticism would be: An approach lacking a precise single aim is ineffective because it fails to have a least-cost solution. On the other hand, it is undoubtedly true that we have in fact more than one problem; we are faced with more than one challenge. So, there is a political rationale for combining different problems in one package of solutions. The economic consequence of a multi-dimensional framing is: There are potential synergies to be identified – and consequently to exploit. The political consequence is: The resources which are at the top of the ladder of scarcity are not natural resources, not for example the scarcity of the earth's atmosphere for anthropogenic greenhouse gases. Scarcest are the resources of top political bodies in coordinating anthropogenic common behaviour. The multi-dimensional, the 'synergistic' approach fits into this characteristic of the relative importance of respective scarcities.

Subjects in the package

The three items which Europe put in one package are climate, energy and competitiveness. 1) Europe wants to put a stop to anthropogenic climate change just before it tends to become dangerous. 2) Europe wants to overcome the perspective that a shortage of classic energy carriers will one day threaten the lifelines of modern societies, i.e. the logistic system –so that military reactions inescapably come into play. And 3) Europe wants to be successful in the interregional competition of a globalised world economic system.

Background of the combination – a historical perspective

These three combined aims are by no means arbitrarily chosen – they are the natural and obvious outcome of a historical perspective on Europe's role in the last two centuries as well as of a view on Europe's relative strengths in economic terms. In short: Europe is fully aware of its interests. This – historical – perspective reads as follows. First: Europe is the region which started the development into an industrialised society, by exploiting underground fossil energies in Europe's territory. The natural consequence is that Europe is the first in being totally depleted of fossil fuels. That means, in perspective, a total dependence on foreign fossil fuels. Second: Europe's constructive industries are leaders in the world market, based on a strong commitment to R&D policy. As a consequence, and I think it is a natural consequence, Europe decided to try to be the first to try to find a way out of the fossil fuel based industrial society – using, if not even giving worth to the skills of it's mechanical industries and technological skills. The technical term is: to become an R&D-intensive, an 'innovative' society. Europe accepted the 'first in, first out'-principle. May I add one sentence to the historical perspective? Europe is convinced that the competition of world powers will be decided on in the realm of technological development – as was the case 200 years ago, when the world powers at the time started to develop into industrialised societies.

How to get to common world systems?

I am well aware that you are interested in how to come to a global system – careful reading reveals that in fact it is two kinds of systems; one with respect to greenhouse gas mitigation, the other with respect to renewable energies market penetration.

It is perhaps a little overstated if I say that the European approach is not to get to a global system by promoting a general consensus on such a system. 90 The road to a global system is not necessarily as scientists tend and like to perceive it. We, the consultants of politicians, develop the ideal economically and 'effective' blue-prints; and they have to hammer out the deals, so that the blue-prints are generally accepted on a worldwide scale one day. We all are politically trained and

well aware that this is not the way ideals become realities. In fact, that's the way to a compromise at the level of the 'least common denominator', which is correctly referred to as "race to the bottom". What we need is the opposite, i.e. a race to the top.

To put it in an analogy: We all are aware that one of the main features why anthropogenic climate change is such an intricate problem, is the existence of what we call positive feedbacks. What we need in addressing the problem is a policy approach which is able to deploy positive feedbacks. That's what the European approach is able to initiate. The initiating nucleus is one part of the world only, a regional community of national states, comprising less than 500 hundred million inhabitants- not more than 8 percent of world population, which is small when compared with the Asia-Pacific region. Our central assets are: We, or our political class and their leaders at least, are united in the consciousness of broad lines of our historical legacy; and we are happy to possess a common political structure in such a way that resistance by some members can be overcome – that is the consequence of the decision-making rules of the European Union, especially for some kind of political subjects. The condition of unanimity no longer holds. The reason why the EU failed to go the energy tax route, and seems to be successful in going the emissions trading route, is purely due to constitutional features. It is due to the power to overrule those members, who inevitably and always exist and who hesitate or even oppose.

Europe takes on more commitments than it is obliged to

The European Union decided to follow two routes. the mitigation obligations, which are or will be decided on at the multi-leveral level under the UNFCCC – with respect to this, the approach is 'only' a breakdown of the obligation the European Union will take in Copenhagen in December 2009 to member states and to stakeholders. The second obligation is to enhance the fraction of energy from 120 renewable sources in final energy consumption. For this obligation, there exists no commitment above the regional, European level. It is a commitment taken totally voluntarily. Nevertheless it is, inside the European Union, broken down as if it is a commitment like the GHG mitigation commitment – in full analogy. Every member state of the European Union has to deliver, according to exact figures on the time scale up to 2020.

How commitments of the European style are able to be the nucleus of a global system – the 'positive feedback' issue

There are two options to get collectively to a global system: one by consensus, and the other one by starting a system in one part or one region of the globe – and other countries may see their interest in joining and consequently join; that is the "positive feedback" model.

That third parties will "detect their interest" is not a question of self-inspection; it is depending on real reasons. There must be benefits offered, at least in the form of avoidable costs (of not joining the system, which the forerunner region initially established). There are several potential benefits the EU is offering. I will mention two of them – each as an example only. Each stands for a separate kind, with a different character. First, the inclusion of international aviation in the European emission trading system (EU ETS). It reads as follows. The leading decision is a general rule, and is announced to be implemented: For every flight departing from or arriving at an airport under EU jurisdiction, emissions rights according to the induced greenhouse effect of that flight have to be presented – i.e. have to be bought in the European system, with the money from these sales flowing into the budgets of European states. From this general rule, an exemption is offered to third countries, outside the EU: The obligation imposed will be restricted to flights in one direction only – in or out – if the related country has introduced what is called a "comparable system". The

consequence, as far as I see, is straightforward: **The regional system will, step by step, develop into a system of wider scope – perhaps one day to a true 'global' system. That is due to the built-in positive feedback feature.**

The second example is a purely beneficial one. There are two background features I have to introduce. Firstly, the EU decision to mitigate GHG emissions at least by 20 %. That is a decision without any condition. In addition, the EU decided on a conditional offer: In case of an appropriate outcome in Copenhagen in December 2009, the EU is committed to accept a reduction level above 20%. Literally, the decision reads "(up to) 30 %". According to the upper bound of the Bali declaration, the EU offer seems for me to be up to minus 40 %.

Then, the EU is consequently departing from a 'territorial' understanding of a country's mitigation obligations – which is fully in line with the Kyoto-approach. Furthermore, the EU is, like the UNFCCC secretariat, thinking in what I call 'big CDM' categories; CDM is seen as the, or at least one of the major investment (financial) vehicles for technologies in developing countries – the corollary of this is that the 'technology transfer' issue is not (so much) seen in terms of 'intellectual property rights' (for technologies), but in financing terms. It is against this background to stress a provision which is fully-elaborated in EU's legislation for the case of a success in deal making in Copenhagen, which implies an on-top obligation, additional to the minus 20% obligations for the EU: of these, 50 % is allowed to be fulfilled by investments on the territory of foreign countries.

Given the equivalence of mitigation obligations to be realised in third countries and investment flows from Europe to those destinations, there could well be many countries which now may change their view to fit into their interests. Now they may be able to see a Copenhagen deal, with mitigation obligations (for the EU) as high as possible, as in their interest. Given the conditionality clause in the EU mandate for the Bali Action Plan, **high mitigation aims for themselves are now in their interest, because with increasing percentage points of mitigation, the investment flow induced is increasing overproportionally.**

That is a setting which fosters a 'race to the top' - an Emission trading system globally expanded as far as possible. However, you should bear in mind that from a sectorial view, the EU decided to restrict the scope of the ETS to energy intensive (or emission intensive) industries. There is no intention to have a common trading system for all kind of sources.

How the energy efficiency option is (synergetically) interlinked with the renewables enhancement obligation

Having read this so far, one might wonder about Europe's generosity. This astonishment may increase if you realise that the obligations the European Union decided to accept for itself are not confined to investments at home. The answer is that the following case also holds true: Europe is taking care of its well-calculated interests, and Europe is aware of potentially overstretching its own resources.

In order to provide a feeling for this, I will end by mentioning two features of the European system to promote renewable energies.

The first feature: What I call the 'built-in synergy'. The aim of renewables promotion is not formulated in absolute figures. It is not decided how much energy from renewable sources (in GJ/a) has to be produced or to be imported in 2020. It is not like the GHG mitigation obligation of 20

%, which can equivalently be stated as minus 1 Gt/a in 2020. **The aim of the EU Renewables Directive is rather defined as an increase of the share of renewables in final energy consumption, from currently about 8 % to a future figure, in 2020, of 20 %,** i.e. an increase of 12 percentage-points.

This increase is relative to the final consumption in the EU member states in future. While it is not relative to primary energy consumption, so it is independent of an potential change in the basket of primary energy carriers. Also it is not dependent on a fixed figure but on a future figure.

Final energy consumption in 2020 is a potential subject of member states energy policy – the so-called energy efficiency policy. The main wisdom in the European approach is in my view, the break down of renewable quotas obligation to the member states – it is theirs to make the best with the built-in synergy.

The second feature: It has already been mentioned that the renewable promoting system as developed by the European Commission is not a territorially focussed one. Imports are allowed, a high degree of flexibility is given, as in the emission trading system, by a trading system which aims at so-called 'guaranties of origin' (GoO).

This system can be revealed as the nucleus of a system which could one day spread over the globe. It is this unusual feature, which makes the wording so important. The subject of the regulation to promote renewable energies, is "energy from renewable sources". That in fact means: Final energy is a produced energy – and the emissions during the process of production matter. 'Process quality' is important to be brought into perspective, via Life Cycle Analysis (LCA). The final success of the emergence of the industrial society can be expressed by using the complementary term "energy from fossil fuel sources": In the end, the portion of energy from fossil fuel sources in final energy was 100 %. The historical obligation which we now face, is to bring this quota down to near 0% again – and to bring the complement, energy from renewable sources, up to near 100% .

Given two features that the secular challenge as elaborated above and that the uneven endowment of different regions with respect to the efficiency of investment in renewables, **it would be obviously highly inefficient to develop a renewables (investment) promoting system along the lines of even commitments per country to invest on its own territory.**

Conclusion

My main aim was to make you aware of the unusual but potentially successful approach that the European Commission has tabled and which is not fundamentally opposed in Europe's legislation so far. It is so unusual, that there is a danger of not becoming aware of it.

My conclusion is stressing the main features with respect to a potential and self-feeded interregional expansion, which are: First, emissions trading system as well as renewables promoting system are both seen from their other side (of the coin), i.e. from a financial, an investment flow promoting perspective. And second, the R&D aspect of the renewables promoting system is given appropriate weight. Here, I think, a burden sharing or effort sharing agreement is still to be negotiated on a multilateral level – according to my conviction only in a setting for OECD 240 countries.

How both systems which have been made the subject here on the occasion of IGES's tenth anniversary, may potentially evolve together, in synergy to each other, is worth making the subject

of further research. Perhaps the Asia Pacific Region will be able to develop a perspective – and consequently a model – of how both of them fit with each other under the specific conditions of this part of the world. I would be happy to have a look at such a system one day in the future, for example, on the occasion of IGES's fifteenth anniversary.
Thank you for your attention.

< Questions & Answers Session >

Q1. You never quite finished telling us how the EU came to introduce emissions trading during the 1990s instead of environmental taxes. Could you tell us something more about the reasons behind that decision?

A. I did not tell the whole story with respect to the European decision as the reason for choosing the trading approach instead of the tax approach was little bit 'crazy' – it was not really a 'choice'. Heading to Kyoto, in 1997, the European Union did what they could to ensure that the trading paradigm would not arrive at the climate treaty – but they were not successful. Later, the European Union learned that they not were able to pursue the tax approach due to the hindrances I mentioned; it was not until then that they switched, choosing the trading approach which they have been fiercely fighting against.

For an economist it is very simple to understand the central hindrance and how it has been overcome: tax and trading approach are, in economic terms, equivalent, as they are different in legal terms. The (European) constitution is written in legal terms, therefore holds: The voting requirements with respect to the two approaches are different – there is no unanimity requirement in trading matters. Trading can yield the same amount of money and therefore it is not essential which to follow, the tax or the trading approach. It was really the United States which gave the Europeans this chance to get out of their self-blockade.

Q2. I read in a newspaper just a short while ago that the EU and the United States are moving to develop international standards, or rules, on biofuels and related issues such as deforestation. I expect this is something along the lines of forests needing to be a source of biofuel material and that they should not be destroyed. I learned from the Nihon Keizai Shimbun that the EU and the United States are taking initiatives to develop common regulatory rules and already have a working group up and running. How will this development play out? To regulate chemical substances we have the EU's REACH regime, and I would like to know how this development will affect energy and fuel, not least the biofuels that we have been discussing today.

A. The second question is about the idea behind the sustainability standards for biofuels and the prospect for European-U.S. collaboration on this issue. First, I am not aware of any idea of intense EU-U.S. collaboration with respect to biofuel standards. Second, with respect to European ideas, the draft directive, tabled on the 23 January 2008, means that we are now deliberating on promoting renewable energies. There is a provision included on what I call the 'process quality' of biofuels. This expression hints at trade law and means that we are no longer only looking at the CO_2 volume we are emitting by burning the fuel, we are instead taking additionally into account the amount of CO_2 (or other greenhouse gases) which were emitted during the process of producing the biofuels. This has to be seen in the context of very encouraging approaches, not of the United States, but of the state of California, to regulate the 'process content' of fuels like conventional diesel and gasoline from fossil sources. The European Commission's Renewable Directive proposal states, the Renewables can only count as 'energy from renewable sources in the understandig of the Directive, if they generate, process emissions included, a 30 percent reduction CO_2 or other greenhouse gases. In deliberations with the European Parliament, there are groups proposing to raise this figure up to 60 percent.

- **These issues are, by nature, cross-border.** In as much as actions within individual country are important, the cross-border efforts are just as essential in order to achieve results.
- ESCAP's role is **to bridge global and national level of activities.**
- So as developing countries in the Asia and the Pacific strive for continued economic growth, in our view it is very important to keep in mind that **alternative patterns of growth are possible.**
- ESCAP highlights **a concept called ecological efficiency.** Basically what it means is providing the same level of services with less ecological impact.
- In terms of policy tools to maximise ecological efficiency, there are two broad areas. One would be **intervention into price structure** and the other one would be **development of sustainable infrastructure.**
- Another area that we try to assist with is **the creation of policy dialogue among different stakeholders** in the region, especially related to the post-2012 Climate Regime.

ESCAP Promotes Climate Action via Green Growth

Shigeru Mochida

Deputy Executive Secretary,
United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

Profile

Mr. Shigeru Mochida joined the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) as Deputy Executive Secretary in April 2005. Prior to his current assignment at UNESCAP, Mr. Mochida was Deputy Director of Africa I Division of the Department of Political Affairs, United Nations Secretariat, New York. In the United Nations, he was engaged in peaceful uses of outer space and applications of space technology, prior to moving to a newly created office within the Office of the Secretary-General where he was among those who first focused on the holistic approach to early warning and prevention of conflicts. He subsequently concentrated on prevention of conflicts, peace-making and post-conflict peace-building covering Asia, Africa and the Middle East. He also served in the Ministry of Foreign Affairs of Japan, where he dealt with major issues brought before the United Nations General Assembly and the Security Council as well as political and international security matters between Japan and the United States. Mr. Mochida received his undergraduate degree from Hitotsubashi University, Tokyo. He received his degree of Master of Public Affairs in international relations from Woodrow Wilson School of Public and International Affairs, Princeton University.

ESCAP Promotes Climate Action via Green Growth

Shigeru Mochida
Deputy Executive Secretary,
United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

The role of ESCAP: to bridge global and national level of activities

First of all, I would just like to say a few words about ESCAP. That stands for Economic and Social Commission for Asia and the Pacific which is actually the economic and social arm of the United Nations Secretariat located in New York. As such, we try to promote regional collaboration in the Asia-Pacific region to attend our common goal. Now our geographic reach is rather wide and also deep in a way. Our member countries stretch from Turkey in the west and then to Kiribas in the east, Russia in the north, and then down south all the way to Australia and New Zealand. Now the issues that we face are such issues as climate change. And **these issues are by nature cross-border. In as much as actions within individual country are important, the cross-border efforts are just as essential in order to achieve results.** In fact, without them you cannot reach any satisfactory conclusion.

You probably have heard that so many UN agencies are engaged in climate related action and in fact it is difficult nowadays to find a UN body which claims not to be involved in climate action. Therefore, you might wonder that UN agencies must be duplicating each other. Our common answer to this is that each UN agency has different strengths, varied expertise and we do cooperate, collaborate, and then coordinate our climate actions for a common goal.

Now when you look at the UN set up on a global scale, UNFCCC as you know is the primary body responsible for the implementation and enforcement of agreements already done as well as for negotiations for future regime. A very good example is the post-2012 Climate Regime. And IPCC together with WMO and UNEP provide scientific assessments. And other UN agencies engage in activities in different areas of their strengths. Then we go down to national level where the UNDP is the main body providing the assistance to quite a few countries. Now UNDP is assisted by different specialized agencies which have their own expertise in their own sector.

Now you can probably see that there is a vast gap between the global level and the national level. There is a huge area there, called the regional level. That is where regional commissions like ours tend to operate. Therefore **ESCAP's role is to bridge global and national level of activities** taking into account geographical, cultural as well as climatic proximity of countries located in the same region. Another characteristic is that ESCAP is not a pure environmental agency, nor another technical agency. We are a general development assistance organisation. And then as we deal with any issue, we do so not only from environmental standpoint, but also from 1 socioeconomic development standpoint.

Economic growth and the poor

There is I think a common understanding about the general characteristics of Asia-Pacific region in terms of the past few years' economic growth and its impact on the environment in the region.

Just one thing I would like to say is that the rapid economic growth which has been very good for the region has caused significant ecological and environmental stress in the region. Right now the Asia-Pacific region already accounts for about one-third of the GHG emissions which is rather grave. Now even graver is the fact that at the same time just about two-thirds of the world's extreme poor reside in the Asia-Pacific region. Earlier in the year, the Secretary General of the United Nations stressed the importance of doing something about the bottom billion. One billion people in the whole world living on less than one dollar a day. In fact two-thirds of them live in the Asia-Pacific region.

Therefore economic growth for the Asia-Pacific region is a must, but then the question would be if they do pursue economic growth, then would it be inevitable for our entire region to face quite a bit of increase of GHG gas emissions? Now with this in mind, I would like to quickly move to the next point.

Various development patterns seen in Ecological footprints

There are different patterns of growth available out there. Now in this connection I would like to use the word ecological footprint which is basically a term that estimates environmental pressure in a given country based on its average consumption and production patterns.

When you look at two or more countries of just about the same level of economic development, just for this argument sake I say Japan and the United States, you can see quite a difference in terms of ecological footprint, 4.3 for Japan whereas it can be as high as 9.7 for the United States. Now the Republic of Korea is another interesting example. Its GNP per capita is about half of Japan's at this point. Yet, its ecological footprint is already at about the same level. Now the same can be said for energy intensity as well as CO_2 intensity.

This basically shows that the same level of development does not necessarily mean the same level of ecological stress or pressure. **So as developing countries in the Asia and the Pacific strive for continued economic growth, in our view it is very important to keep in mind that alternative patterns of growth are possible.** And they tend to offer better possibilities for accommodating both developmental concerns which are essential as well as ecological environmental concerns.

What makes the difference in terms of patterns of economic growth? These are not too very difficult to imagine. They are differences in socioeconomic structures, infrastructure, consumption pattern, lifestyles, and of course public policy. A good example in our view is the transport sector. Japan and EU or European countries are known to have a good combination of railway and road networks. They tend to have smaller ecological footprints certainly compared with United States and Republic of Korea where reliance on private cars is really heavy.

"Green growth" by maximising ecological efficiency

Similarly vehicle size tends to make a lot of difference. And as you know consumer's choice

for vehicle size is very much influenced by public policies especially tax policies. So **ESCAP, therefore, highlights a concept called ecological efficiency. Basically what it means is providing the same level of services with less ecological impact.** And this rather broad concept gives us the basis for advocating for green growth, basically greening the growth pass for the Asia-Pacific region or countries.

Now **in terms of policy tools to maximise ecological efficiency, there are two broad areas. One would be intervention into price structure and the other one would be development of sustainable infrastructure.** I would just like to emphasise the linkage between these two areas. Fiscal policy can certainly be employed to influence consumer's choice for more environmentally-friendly, less stress producing products and services. But for consumers to be able to have that choice there has to be a choice available out there, perhaps as a result of infrastructure development. And this is why we emphasise the importance and need to invest in development of sustainable infrastructure such as public transportation system.

Capacity-building & the creation assistance of policy dialogue

ESCAP's activities can be categorized into two areas. One would be providing innovating policy ideas, searching for good practices throughout the region, documenting them, and then making them available to the countries of the region. And then we try to do some capacity-building through seminars and so forth, so that the policymakers of different countries can actually employ them. **Another area that we try to assist with is the creation of policy dialogue among different stakeholders in the region, especially related to the post-2012 Climate Regime.** We are not a negotiating body, but we try to assist regional countries to come up with their own positions based on common analysis.

To conclude, I would like to say that having heard the presentation of IGES Second White Paper, I have noticed quite a few innovative efforts aligning developmental and climate concerns. And this is preciously in line with what we have been trying to promote at ESCAP. I see therefore a great opportunity and great potential for collaboration in the coming days between ESCAP and IGES and I look forward to a closer collaboration. Thank you very much.

Special Session

Panel 1 :

Climate Change and Natural Resources Management

Peter King (Moderator)

Shinichiro Ohgaki

Masahiro Amano

Mark Elder

Henry Scheyvens

Panel Session 1: Climate Change and Natural Resources Management

Natural resources underpin the livelihoods of most Asian communities. The expected impacts of climate change threaten food security, water supplies, economies, livelihoods, national security, and even the long term survival of low-lying areas, while Asia's forests form a carbon sink that also provides globally significant ecological services and biodiversity. Therefore, sustainable management of natural resources and combating climate change cannot be separated.

Moderator

Peter King
Senior Policy Advisor, IGES

Profile

Dr. Peter King has been an avid environmentalist for more than 30 years. Graduating from Melbourne University (B. Ag. Sc.) in 1970 he joined the Soil Conservation Authority of Victoria. In 1977 he graduated with M. Env. Sc from Monash University. He was a Research Fellow in the Environment and Policy Institute, East West Center, Hawaii from 1981-82. From 1982-1990, his consulting companies, Terra Firma Environmental Consultants and ACIL Australia, worked on environmental issues throughout Asia and the Pacific. In 1991, he started work with ADB as an Environment Specialist, Office of Environment. In 1998, he was awarded a Doctor of Philosophy (Environmental Science) degree from Murdoch University in Perth. In 2001, he was appointed Manager, and subsequently Director, Pacific Operations, ADB. In 2005, Dr. King took early retirement from ADB to become Senior Policy Advisor for the Institute for Global Environmental Strategies (IGES).

- Another vulnerability is social vulnerability…The rainfall cannot be used as it is, but there should be water supply systems that collect and distribute it for use. The pipes and treatment facilities involved are **part of the social infrastructure and are prone to damage in earthquakes and other natural disasters.**
- We should also conduct proper conservation of water quality so that **we do not allow the water resources to diminish through pollution.**
- The third point has to do with technical measures as well as socioeconomic and policy measures in order to solve water issues. Since **adaptation is often difficult only with technical measures,** though somewhat abstract, it is important to combine these measures.
- **There is no substitute for water resources.** Water is essential to society and to human life, and it has no alternatives. Therefore it must somehow be produced, region by region, where it is lacking.
- In this way, **we could fully utilise water within a social system as a whole** and reduce related energy consumption as much as possible.

The Vulnerability of Water Resources and Adaptation to Climate Change

Shinichiro Ohgaki

Professor of The University of Tokyo

Profile

Prof. Shinichiro Ohgaki was awarded a Ph.D. in the field of environmental engineering from the University of Tokyo in 1974. He has long experiences of education and research in environmental engineering, water supply technology, urban environmental policy and sustainable development at Tohoku University, University of Tokyo and the Asian Institute of Technology (AIT, Thailand), and serves at AIT as a Vice Chair of the Board of Trustees. He directed and managed the School of Engineering, University of Tokyo, as Dean from April 2002 to March 2004, as well as serving as Head of the Center for Sustainable Urban Regeneration (cSUR) at the University of Tokyo from 2003 to March 2008. He serves on the Science Council of Japan, as a member of the Executive Board (former Vice President), and contributes to strengthening domestic and global academic network. He is one of Vice Presidents of the International Water Association, and a steering committee member of the Health-Related Water Microbiology Specialist Group.

Prof. Ohgaki was Project Leader of the IGES Freshwater Resource Management Project from 2004 to 2007, and currently serves as a Senior Research Advisor at IGES.

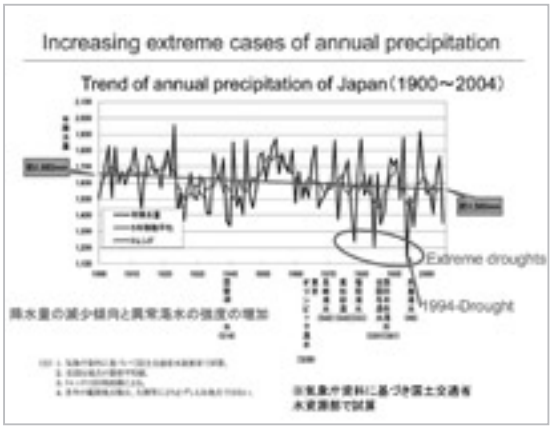
The Vulnerability of Water Resources and Adaptation to Climate Change

Shinichiro Ohgaki
Professor of The University of Tokyo

Two sorts of vulnerability - Natural vulnerability & Social vulnerability

I would like to speak on the topic of "The Vulnerability of Water Resources and Adaptation to Climate Change". As I was myself involved with the IGES project on freshwater resources, I think I will be able to describe its outcomes, albeit indirectly.

First, I would like to touch on the vulnerability of water resources. My thinking is that there are two types of vulnerability. One is the natural vulnerability that you see with rainfall. Clearly rain does not fall evenly on a daily basis; likewise, it rains in some places, but not in others. What is also significant is that the natural ecosystem is extremely sensitive to the quantity and the quality of water. **Another vulnerability is social vulnerability.** For example, society uses water and people use water, so water is important for the maintenance of a hygienic environment. On the other hand, water is also a medium for the transmission of pathogenic microorganisms. Moreover, **the rainfall cannot be used as it is; there should be water supply systems that collect and distribute it for use. The pipes and treatment facilities involved are part of the social infrastructure and are prone to damage in earthquakes and other natural disasters.**

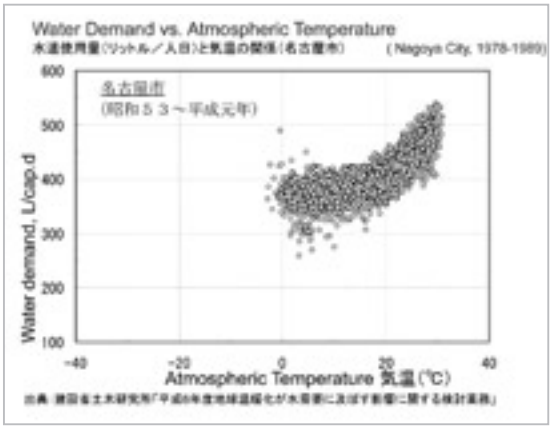


For an extremely atypical case, Sri Lankan wells near the seacoast broke down, became salinated and were put out of use for a long period. This was a result of the Indian Ocean tsunami in 2004. There is also the example of ground water service pipes bursting one after another in the Kobe earthquake of 1995.

The graph(left) shows the danger of climate change impact in Japan. We can see from the graph that precipitation has been falling and that anomalous dry periods of unusual severity have occurred persistently in recent years, increasing in both severity and frequency. The amount of snow on the main Japanese island

of Honshu, has decreased these past 15 years or so. Snowfalls are an important source of water resources, and this trend will have a major impact on water resources.

Drought has all kinds of run-on effects, and here is an example of how that complex has led to land subsidence in the Nobi plain in central Japan. We can see that the major drought of 1994 brought nearly 70 places suffering land subsidence of two centimetres or more, and about 550 places suffering land subsidence from one to two centimetres. In the following year these figures returned to almost the same level as before, indicating that drought induces excessive pumping of groundwater, which then results in land subsidence. In short, this is an example of how extraordinarily complex natural systems are.



Changes in water demand

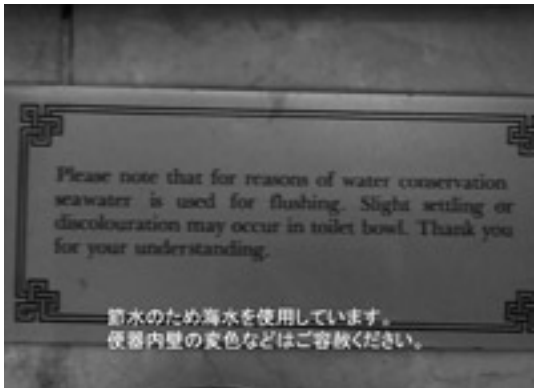
What is the issue here is that water is subject to demand. This is an example from the city of Nagoya of how demand for water changes with the change in air temperature. With temperature plotted along the horizontal axis and water service supply levels along the vertical axis, we see how the volume of water utilisation rises with the temperature increase at 20°C or higher. (Graph top)

Also, here is a graph (middle) created by the IGES Freshwater Resources Project. On the left is data from Bandung, Indonesia, and on the right data from Bangkok, Thailand. These are examples of how the volume of groundwater utilisation changes with the change in regional GDP. We can see how heavily industry is reliant on groundwater.

Recycling water

Cities are experiencing water shortages and have responded with a range of imaginative measures. There are distinctive examples of recycling reclaimed sewage water like the one in the Shinjuku district of Tokyo, which delivers reclaimed water from a wastewater treatment plant for use with flushing toilets. Another example is a major recycling system that supplies reclaimed wastewater from the Shibaura

wastewater treatment plant to the Osaki, Shinagawa and Shiodome districts, where utilisation has recently been on the rise.



Turning to a small-town example, there is the case of Tadotsu-cho, Kagawa Prefecture in Shikoku, an area with a long history of water shortages. The shortage of water is driving the heirs to agricultural lands to leave the town. Since securing supplies of agricultural water is so important to the town, it is constructing a system for using reclaimed wastewater as agricultural water. It is a reclamation system for making reclaimed wastewater even cleaner. They are building a system that distributes the treated water to storage reservoirs and then to rice paddies via irrigation channels.

Looking overseas, there is an example from Tianjin, China. The area has long been suffering from a shortage of water, and there is a wastewater treatment plant. The water is treated in this reclamation system and the treated water is then supplied as flushing toilet water to the residential area. Hong Kong has also long been short of water. Here is a sign (Upper picture) which reads "Please note that for reasons of water conservation seawater is used for flushing. Slight settling or discolouring may occur in the toilet bowl. Thank you for your understanding." In fact, two-thirds of the flushing toilets in Hong Kong use seawater.

Three points for a solution to climate change and water

To conclude, there are three points I would like to make about water issues and issues of climate change in the global environment. The first point is that we need to have a good understanding of the issues of water quantity and quality. The debate about water quantity ranges far and wide, while water utilisation is related to water quality. We could use the same water twice and even three times if we use it in the way suitable for its quality. **We should also conduct proper conservation of water quality so that we do not allow the water resources to diminish through pollution.** The second point has to do with the relationship between water supply and demand. We must pay attention to both sides in the measures of climate change adaptation. **The third point has to do with technical measures as well as socioeconomic and policy measures in order to solve water issues. Since adaptation is often difficult only with technical measures, though somewhat abstract, it is important to combine these measures.**

Lastly I would like to make two points. Since water resources are vulnerable to begin with, a range of social solutions have been taken to deal with the situation. Climate change has a major impact on these existing systems and therefore we must adopt measures in consideration of respective local situation. The other thing is that water resources themselves constitute an extremely complex system within a society, and it is no simple matter when they become tangled up with complex climate change. I think that when we consider adaptation on water resources we must have a holistic and flexible understanding of the issue and integrated scientific knowledge of it. Let me hastily bring this presentation to a close now. Thank you very much.

< Questions and Answer Session >

Q. May the existing solutions to the water crisis actually make the situation worse by increasing energy consumption?

I come from Australia, which is one of the driest continents in the world and climate change is likely to make Australia even drier than it is today. And many of the solutions to the water crisis in Australia appear to be related to highly energy-intensive solutions either through pumping ground water or desalination which is very energy intensive. Is there a danger that trying to find solutions to the water crisis may actually make the situation worse by increasing energy consumption?

A. That is, I think, a very important point. With respect to climate change, I think what we are basically looking at is the question of trade-offs between mitigation and adaptation. What I should mention here is that while for some time now there has been discussion of an energy substitute, or an energy alternative, **there is no substitute for water resources. Water is essential to society and to human life, and it has no alternatives. Therefore it must somehow be produced, region by region, where it is lacking.** I think that in some respects we cannot do anything but using energy to create water for the well-being of the people in those regions. That's one thing.

Another thing is about the desalination of seawater. It was formerly reckoned that desalination required about fifty times as much energy as for make ordinary water, but technological innovations have lowered the necessary amount of energy for desalination until it becomes usable when they need water at any cost. Furthermore, the water produced from seawater is used in cities and then its effluent is utilised as agricultural water. **In this way, we could fully utilise water within a social system as a whole and reduce related energy consumption as much as possible.**

- It is actually **just recently, in the past hundred years or so, that tropical forests have contributed to emissions.**
- **Currently only one case of forestry CDM is registered,** and all of the remaining 1,000 or more cases are emissions reduction projects.
- When developed countries talk about reducing the GHG emissions in the long-term, curbing it to 50% by 2050, **it will be not easy to achieve that target while ignoring the sequestration.**
- **Most of the current measures against global warming are taken in urban areas,** or in newly industrialised economies, rather than in rural areas.
- Therefore, global warming countermeasures and **forest utilisation in day-to-day life** must be harmonised.
- When we look at how forests actually mature and provide their various functions over the extremely long-term, **it is hardly desirable to determine how to handle them in the context of such a short-term framework as five or ten years.**

Climate Change and Forest Resources Management

Masahiro Amano

Professor of Waseda University

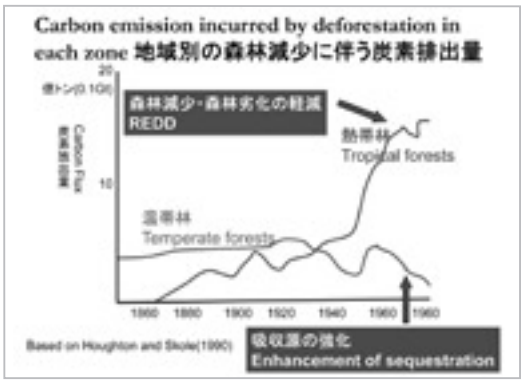
Profile

Prof. Masahiro Amano is affiliated to the Department of Human Behavior and Environmental Science in the School of Human Sciences at Waseda University where he lectures on the relationship between global warming and forests, and theories on tropical forest protection. He has been involved in the UN Framework Convention on Climate Change since the Third Conference of the Parties (COP3) and has mainly been in charge of carbon sinks. He has also pursued research on forest resource dynamics and long-range predictions for forest products. He was in charge of compiling statistics on global forest resources for the FAO, and has been involved in the issue of declining tropical forests since the 1980s. He has also been part of forest conservation projects in various countries as a JICA expert.

Climate Change and Forest Resources Management

Masahiro Amano
Professor of Waseda University

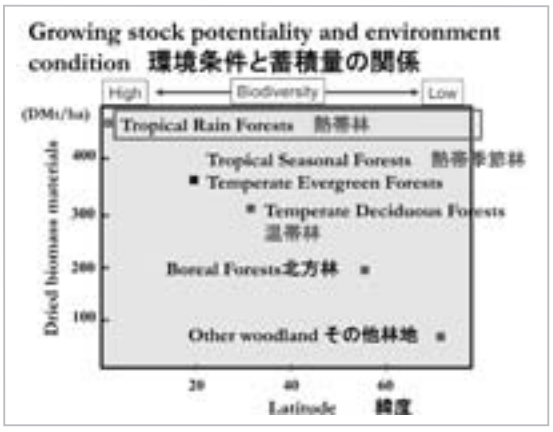
I would like to speak about the relationship between climate change and forest resources management and describe the substance of the debate on stopping greenhouse gas emissions caused by the problem of deforestation. I'd also like to look at sustainable developments in tropical forests and temperate forests.



Tropical forests as sequestration and emission source

Where the temperate zone once had forest coverage of as much as two billion hectares, it is now down to 600 million hectares, or less than one-third of the original coverage, and large volumes of CO_2 have been emitted in the interim. **It is actually just recently, in the past hundred years or so, that tropical forests have contributed to emissions.** The IPCC's recent fourth assessment report stated that their emission volume amounted to about 20% of all human greenhouse gas emissions. Although several questions remain to be answered about this number, it is nevertheless extremely large and reports, since the third assessment report, have said that there would be no greenhouse gas reductions without tropical forest action. It is only in the past few years that it has actually been raised in discussion in the context of the Kyoto Protocol.

What we had been saying about the sequestration of temperate forests is that they were performing their sequestration function adequately. To turn that around, some countries wanted to include them in the Kyoto Protocol for that reason, and actually forests are treated as sequestration in the Kyoto Protocol. The current debate is whether the tropical forests generating emissions can be considered in the REDD, the Reducing Emissions from Deforestation and Degradation in Developing Countries, within the framework of the Kyoto Protocol. There is due to be a SBSTA workshop on this subject.



The tropical forests are accumulating extremely large amounts of carbon. Half of their biomass, as dry weight, corresponds to carbon, which is a very high potentiality of CO_2 accumulation. Meanwhile, that level is very low in boreal forests and in degraded forests. REDD focuses on this

aspect. Tropical forests also play an extremely significant role in terms of biodiversity. This is why people involved with global warming think that conservation of tropical forests will have favourable results in many senses.

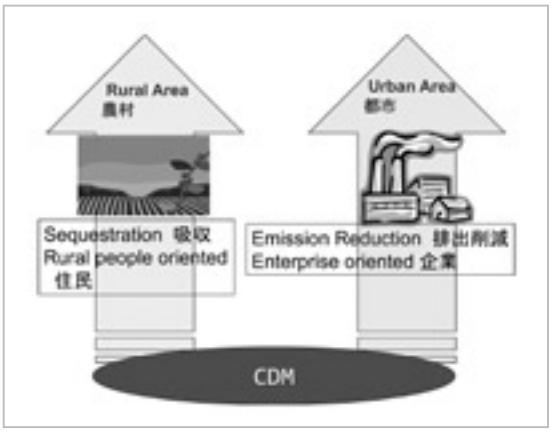
Forests and CDM

It was attempted to include the reduction of deforestation in the CDM. At that time, we thought that there are sufficient measures for emission reductions in the industrial sector, but this would be limited to urban areas. I felt that it would be very good to treat forests as new channels for climate actions in rural areas. Unfortunately, it was not included in the CDM at the international climate negotiations, whereas, afforestation and reforestation (A/R) was successfully included.

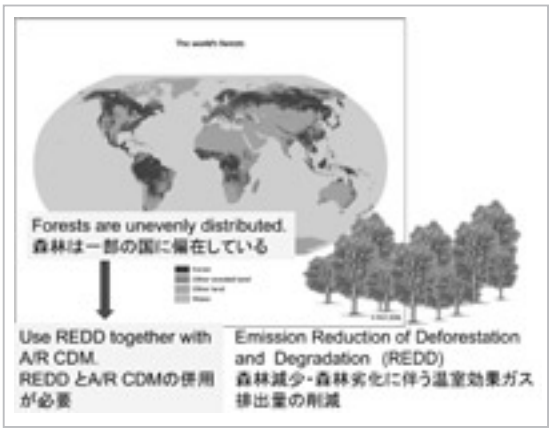
Currently only one case of forestry CDM is registered, and all of the remaining 1,000 or more cases are emissions reduction projects. Moreover, these projects are largely in a few such countries as China and India, and many developing countries are not included in such programmes. This is one factor that led to the effort to incorporate REDD, and many of the other developing countries were extremely positive about this.

Raising the expectations for REDD

As a matter of fact, a group of researchers got together yesterday to discuss a number of things at the workshop organised by the Forestry and Forest Products Research Institute in advance of next week's SBSTA. Furthermore, **when developed countries talk about reducing the GHG emissions in the long-term, curbing it to 50% by 2050, it will be not easy to achieve that target while ignoring the sequestration.** The opinion has thus emerged which could be the background of developed country to support for REDD. One problem, however, is that although the idea of using REDD to reinforce the CDM is a good one, deforestation is in fact concentrated in just a few countries.



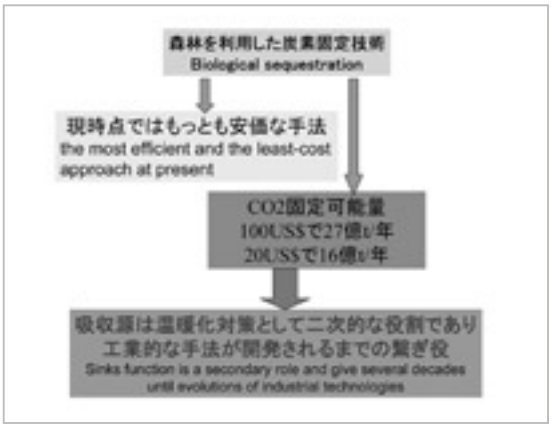
A forest distribution map would show that 60% of global deforestation is in the top two countries of Brazil and Indonesia. The top five countries, including Zambia, actually account for over 80% of deforestation. Even if we put REDD fully into effect here and now, it would actually affect only a few countries, and the developing countries that did not receive benefits from the CDM replanting programmes will likely again be discouraged in the same way. This was a conclusion we reached in the meeting of



researchers yesterday.

In that sense, it does not seem that REDD would not work well on its own and what was pointed out was the need to be promoted in parallel with the A/R CDM. **Most of the current measures against global warming are taken in urban areas, or in newly industrialised economies, rather than in rural areas.** In fact, they are not quite functional in the impoverished countries. Considering how to resolve this, the conclusion was that we need to review the CDM once more. Afforestation CDM is possible in developing countries that are not yet industrialised.

Harmonisation of global warming countermeasures and forest control



There are currently two schools of thought on how forests are involved against global warming.

One is that, among carbon fixation technologies using forests, the least expensive and most certain approach is in fact afforestation or forest conservation. How to get this functioning well is an important issue, and in fact afforestation CDM does not work well in developing countries because of leakage and several other problems. However, with the potentiality of tropical forests, the fourth assessment report indicates extremely high numbers for their fixation potentials of CO_2. In this light, while sequestration is a secondary means of global warming countermeasure, it should prove extremely significant as a stopgap until the evolution of effective technologies. This thinking has also emerged in debates at the IPCC.

In that sense it is highly desirable that sequestration and emissions reduction should operate within the same scheme. Looking at the current situation of developing countries, global warming countermeasures focus solely on CO_2 sequestration. The forests thus utilised, however, are of great socio-economic significance for people living in rural community areas and are crucial in their daily livelihoods. **Therefore, global warming countermeasures and forest utilisation in day-to-day life must be harmonised.**

Desired framework in the longer term

For what we call "sustainable forest management", the requirement is to achieve simultaneously the varied functions of a forest, including the conservation of water, biodiversity and ecologies. Over half of the world's timber is actually fuel wood and less than half of the world's harvested timber typically goes to paper and construction material. We also have to consider such aspects simultaneously. **When we look at how forests actually mature and provide their various functions over the extremely long-term, it is hardly desirable to determine how to handle them in the context of such a short-term framework as five or ten years.**

We need a common framework when we temporally utilise a function of forest CO_2 sequestration and will introduce the carbon fixation technologies in future. However, we may actually need another framework in the long-term when we consider poverty in the forested and tropical regions.

In this sense, we are in fact caught in a dilemma. Considering sustainable forest management under the current framework of the Kyoto Protocol would not lead to a resolution to the substantial issues in forestry. On the other hand, it is effective when foccussing on global warming. What I would like to emphasise is that when you think about forests in the context of global warming, you should understand that there exist very comprehensive issues. And here I would like to conclude my presentation.

- Biofuel is a generic term referring to fuel produced from biomass such as plants or waste. The important thing is that **they can substitute for fossil fuels especially for transportation.**
- China intends **to have 15% of its transportation energy accounted for by biofuels** by 2020.
- The first concern is the potential for a **conflict between food and fuel,** because the feedstocks of biofuels come from agricultural crops.
- The big question relating to climate change is **how much can biofuels really contribute to GHG reduction.**
- If inappropriate production methods are used or if biofuels are produced by cutting down the rainforests, then **GHG emissions could actually be increased instead of reduced.**
- We still wouldn't be able to replace all of our transportation fuel. So **there is a fundamental limitation.**
- I think we need to consider biofuels much more broadly **in the context of overall energy policy.**

Biofuels

Mark Elder

Manager, Programme Management Office, IGES

Profile

Dr. Mark Elder is a Principal Researcher and Manager of the Programme Management Office. He has been leading research projects on biofuels and economic integration. Other research interests include renewable energy and waste/recycling. He earned a Ph.D. in political science from the Department of Government, Harvard University. He joined IGES from September 2006. Prior to IGES, he worked as an assistant professor of Political Economy and International Relations at Michigan State University. In 2005 he received a Japan Foundation Fellowship to research Japan's environmental protection policies and economic competitiveness at the Institute of Social Science, University of Tokyo.

Biofuels

Mark Elder
Manager, Programme Management Office, IGES

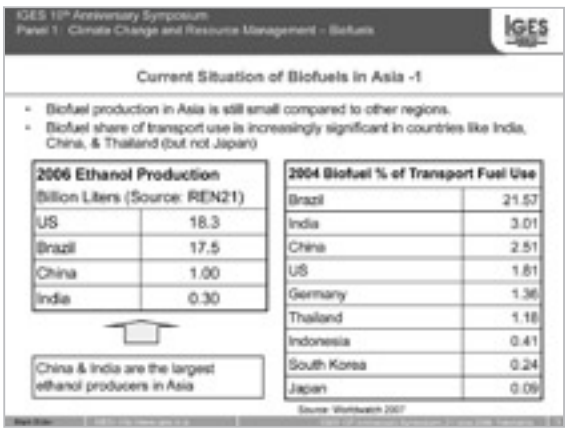
What are biofuels ?

First, I would like to say a little bit about what biofuels are. **Biofuel is a generic term referring to fuel produced from biomass such as plants or waste. The important thing is that they can substitute for fossil fuels especially for transportation.** There are two main kinds. The first is ethanol, which is a substitute for gasoline. The other is biodiesel, which is a substitute for diesel fuel.

Currently, most biofuels are what we call first-generation biofuels. These are made from agricultural feedstocks. Some of the important feedstocks that are used to produce biofuels, for example, are corn and sugarcane for bioethanol, and biodiesel is made from oil palm, Jatropha, coconut, and soybeans, and others. There is also a lot of research being conducted on what's called the second-generation biofuels which use advanced technology. They are typically made from non-food feedstocks, including for example plant or wood waste, and this is often called cellulosic biofuel. Microalgae is another example.

Increasing interest in Asia

Next I would like to say a few words about the current situation of biofuels in Asia. In terms of production, biofuel production in Asia is still small compared to other regions. For example, the US in 2006 produced 18 billion liters whereas Asia's largest producer, China, produced 1 billion liters. In terms of biofuel share of transport use, it's increasing and we can see this especially in countries like India but still not much in Japan yet.



However, there is a great deal of interest in biofuels in Asia, and many Asian countries have plans to increase their biofuel production and consumption using a variety of policies, for example, numerical targets. **China intends to have 15% of its transportation energy accounted for by biofuels by 2020.** And I think Thailand maybe has the largest target of 20%. Other policy that are being used includes blending mandate, which have been introduced in many countries, and economic incentives such as tax exemptions and subsidies. However, these targets will be difficult to meet for various reasons including high costs, difficulties in increasing production, and shortages of feedstocks and refining capacity.

There are three main reasons why there is a lot of interest in biofuels. First, biofuels have the

potential to reduce greenhouse gas emissions, which is the main focus of today's discussion. However, for many governments especially in Asia, this is not their main concern. Instead the main interest of many governments is energy security, which is the second main reason. Governments believe that by promoting biofuels they can diversify their energy supply and perhaps even reduce costs. Third, many developing countries in Asia are hoping that biofuels can help promote economic development, especially in rural areas, and provide new markets for agricultural products. So for these reasons there is a huge amount of interest in biofuels.

Concerns about biofuels

However, there are many concerns about biofuels and I will discuss four of the main ones here.

The first one is the potential for a conflict between food and fuel, because the feedstocks of biofuels come from agricultural crops. Many of these crops are being shifted from food to biofuel. So this could contribute to a food shortage or food price increase. And many people believe that this is happening right now.

The second one, and I think this actually needs a lot more research and people have not paid enough attention to it, is the potential for water shortages. More cultivation of biofuel crops could lead to worsening of the water problems that were mentioned earlier.

Thirdly, there is a question about land availability. And finally, it's not entirely clear that GHG emissions will actually be reduced by biofuels, and this depends on actual energy use as well as land changes. For example, many people fear that more production of biofuels crops may come at the expense of forest destruction, and this would increase GHG emissions instead of reduce them.

Contributions to GHG reduction

So **the big question relating to climate change is how much can biofuels really contribute to GHG reduction.** And the answer is not quite clear yet based on current research. The lifecycle assessment research has shown that first-generation biofuels, for example, from food crops, could produce more energy than they consume in the production process and thereby reduce GHG emissions. However, this depends on the actual production processes including energy and fertiliser use and also the nature of any land use change. And **if inappropriate production methods are used or if biofuels are produced by cutting down the rainforests then GHG emissions could actually be increased instead of reduced.**

And there is also a fundamental limitation based on current technology. So for example, the International Energy Agency estimated that biofuels could account for at most 7% of world road fuel by 2030 under optimistic assumptions. And even second-generation cellulosic biofuels might reach only 25%. But basically even if we converted all of our agricultural land to biofuels **we still wouldn't be able to replace all of our transportation fuel. So there is a fundamental limitation.** Nevertheless, even though in percentage terms this might be small, in absolute terms this could actually replace a lot of transportation fuel.

Necessity of further R&D

So probably there is much more potential for second-generation biofuels rather than the first-generation. And these can be produced from a much wider range of sources especially waste from agriculture or forest or municipal waste. However, the production processes are more complicated

and costly. And even though there are many pilot projects around the world, they don't appear to be commercially viable yet. Moreover, even second-generation biofuels are not entirely free from environmental effects especially if we are still going to use agricultural feedstocks

There are other challenges with second-generation biofuels, for example, organising a collection system and transport costs. So, I think one thing we have to do is continue our research and development, and many governments are already doing this. One conclusion that we reached in our policy research is that Asian countries should conduct their own research on second-generation biofuels. This is because these may be location-specific especially relating to producing the feedstocks and how they are used and so this will require a locally oriented research.

Biofuels as energy policy

More importantly, **I think we need to consider biofuels much more broadly in the context of overall energy policy.** So it does appear that biofuels could make an important contribution even if it's only a small percent. Nevertheless, to solve our energy problems other measures will also be needed. For example, we must not forget energy conservation which could make a much greater contribution to GHG emissions reduction and energy security compared to biofuels, especially the first-generation ones.

Also we need to consider other forms of renewable energy. There are many forms besides biofuels, for example, solar, wind, and geothermal and so we need to consider these as well. We can also consider reducing subsidies for fossil fuels. Biofuels really need to be considered in the context of a comprehensive energy policy.

Biofuels not a silver bullet for our problems

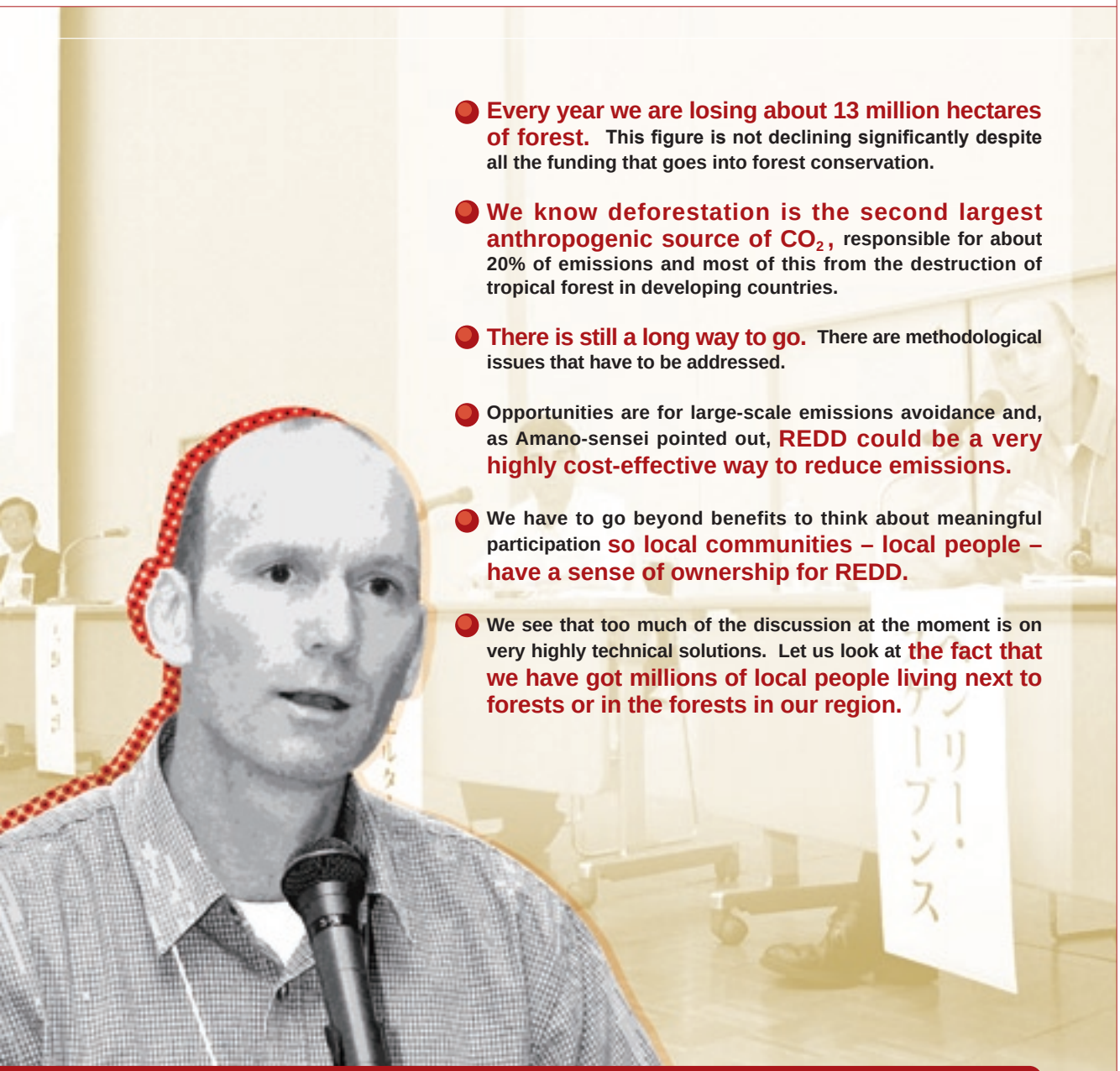
So overall our recommendation is for a cautious approach. The costs and benefits should be carefully examined, especially regarding the food and fuel conflict. Figuring out how biofuels can be produced sustainably is a big challenge. And more research is needed in order to clarify the environmental, economic, and social impacts of biofuels. We also need to work on developing better and cheaper biofuel technology especially for the second-generation.

In conclusion, biofuels may have potential but they are not going to be a silver bullet for our problems. Thank you very much.

< Questions & Answers Session >

Q. It seems that one problem with biofuels is that prices of foodstuffs and other items are rising. Something I saw on television is that researchers are conducting research to produce automotive fuel from sunflower seeds and that one of the local authorities in Tokyo is running buses on fuel made from sunflower seeds, just something I happened to see on television. I'd like to ask about whether sunflower seeds, which people do not make much use of as a foodstuff, might have a brighter future as a new option for a global biofuel. What I'd also like to ask is whether you are aware of sunflower fuel and what you think of its possibilities going forward.

A. Thank you very much. Yes, that's a very good question. And actually there is a lot of research being conducted about many kinds of alternatives not just sunflower seeds but also Jatropha and many, many others. Jatropha is more commonly discussed because it needs less water and can be growth on wastelands. But the issue here is that, they still use land to produce. And the point is this land could have been used for some other agricultural crop. So it doesn't just have to do with exactly what the feedstock is. Now another counterargument– there are many – is that there are many other causes of the current rise in food prices, for example, the weather or even climate change and not just biofuels. But anyway it's not clear that just using a different feedstock will be able to solve the food-fuel conflict.



- **Every year we are losing about 13 million hectares of forest.** This figure is not declining significantly despite all the funding that goes into forest conservation.
- **We know deforestation is the second largest anthropogenic source of CO_2,** responsible for about 20% of emissions and most of this from the destruction of tropical forest in developing countries.
- **There is still a long way to go.** There are methodological issues that have to be addressed.
- Opportunities are for large-scale emissions avoidance and, as Amano-sensei pointed out, **REDD could be a very highly cost-effective way to reduce emissions.**
- We have to go beyond benefits to think about meaningful participation **so local communities – local people – have a sense of ownership for REDD.**
- We see that too much of the discussion at the moment is on very highly technical solutions. Let us look at **the fact that we have got millions of local people living next to forests or in the forests in our region.**

Reduced Emissions from Deforestation and Forest Degradation in Developing Countries: Risks and Opportunities

Henry Scheyvens

Manager, Forest Conservation Project, IGES

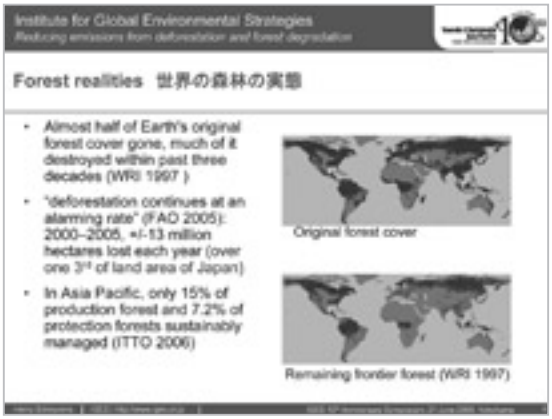
Profile

Dr. Henry Scheyvens, a New Zealand national, is current Manager of the Forest Conservation Project, IGES, where he has worked for the past three and half years. He graduated with a Ph.D. in Political Science from Monash University, Australia, and lectured at two Australian universities before returning to New Zealand to teach in the School of People, Environment and Planning, Massey University. His recent research focuses on forest law, governance and trade. He currently holds the position of Co-Chair of the Asia Forest Partnership.

Reduced Emissions from Deforestation and Forest Degradation in Developing Countries: Risks and Opportunities

Henry Scheyvens
Manager, Forest Conservation Project, IGES

Actual situation of deforestation



I will also talk about the concept of reducing emissions from deforestation and forest degradation in developing countries, less from a technical perspective, more from the social science perspective. First of all, let me turn to some forest realities that we should pay attention to. Since the advent of agriculture, we have lost almost half of our original forests. Much of this loss has been in the last 30 to 40 years. According to the FAO **every year we are losing about 13 million hectares of forest. This figure is not declining significantly despite all the funding that goes into forest conservation.**

Trying to get a sense of how large this area is, perhaps we are talking about over one-third the land area of Japan in terms of forest area being lost. We have the ITTO next door to this building. They undertook a study to find out how many forests or what percentage of forests were under sustainable management in our region. In terms of natural production forest, they concluded only 15%. In terms of forests under protective management, only 7%.

Governance - Key to understand deforestation

What are the drivers of deforestation and forest degradation? Of course, these differ from place to place, from country to country. It tends to be a combination of factors; agricultural expansion combined with wood extraction, and infrastructure development.

We have a very good recent study that's come out from the University of Papua New Guinea. Using remote sensing across their entire country they found that commercial logging that's been formally sanctioned by the government is the major cause of forest destruction, followed by subsistence agriculture. Of course, it differs from country to country. Illegal oil palm plantation development is thought to perhaps be the primary cause of permanent rainforest loss in Indonesia and Malaysia. Also in Indonesia, overcapacity in the wood industry sector is a major problem. Demand from countries such as China, Japan, and elsewhere for pulp to convert to paper and other wood products is also driving the conversion of natural forests to plantations.

Underlying this is a number of factors and in this presentation and in the White Paper we highlight

the issue of forest governance and the need to understand the problems of forest governance. And there are perhaps two observations we can make for many tropical developing countries. Firstly, there are networks of powerful actors that organise to destroy forests and these, of course, are linked internationally. These can include government officials, business people, the military, traditional leaders, and others. The outcome of this is a lack of transparency in the allocation of forest rights, a lack of compliance with forest rules in forestry operations, and large-scale organised illegal logging and illegal land clearance. A second observation we can make is that there are about 1.6 billion people who rely on forests to some degree for their livelihoods. This includes very poor people who are marginalised from forest policymaking and who do not have a chance to participate in sustainable forest management.

Their tenure is insecure. Their traditional livelihood activities, even if these are sustainable, may be criminalised by the state as it passes laws to hand over rights to logging companies for commercial extraction. They have a lack of policy support. Even where there are good policies and good laws in place to engage local people in forest management, there are not the resources available for them to participate meaningfully. They too are engaged in illegal logging and land clearance for their survival. And the outcome of these two factors is widespread conflict as well as a lack of respect for forest law and for the forest authorities themselves.

Forest and climate change

We have already heard from Prof. Amano a lot about forest and climate change so I won't say too much. **We know deforestation is the second largest anthropogenic source of CO_2, responsible for about 20% of emissions and most of this from the destruction of tropical forest in developing countries.** To get a sense of what we are really talking about, we hear every year there is burning of peatlands taking place in Indonesia and that we have a regional haze problem. The drainage, clearance, and the burning of those peatlands produces, it is estimated, more than three times the total CO_2 emissions of Germany.

Of course, climate change impacts on forest; we heard this from Prof. Amano. Most of our terrestrial biodiversity is located in tropical forests. Forests will be critical for adaptation.

REDD, this new instrument that we hear so much about, is concerned with mitigation. It's now part of the UNFCCC process. There is formal consideration of including REDD in the post-2012 climate framework. Funding is being made available. I believe Japan has pledged USD10 million to the World Bank Forest Carbon Partnership Facility. And there are a series of international events and events taking place in Japan, such as the SBSTA workshop which is this month.

REDD implementation : Risks and chances

There is still a long way to go. There are methodological issues that have to be addressed. We know the uncertainties are very, very high in the land use change and forestry sector. REDD

will have to be technically feasible. Already there is a lot of research on this in Japan to do with using remote sensing and so forth for monitoring. It must be adequately financed but there are risks involved with this which I will highlight in the next slide. It must be politically acceptable. At the moment there is a lot of disagreement amongst the parties if we look at the proposals submitted to the UNFCCC. So there is a long way to go. Will it be ready for 2012?

In the White Paper, we highlight the risks to governance particularly to local communities. We also explored some of the opportunities. I want to mention in this presentation the mitigation opportunities and risks as well. **Opportunities are for large-scale emissions avoidance and, as Amano-sensei pointed out, REDD could be a very highly cost-effective way to reduce emissions but there are risks as well.** One fear is it could drive down the global price of carbon. Therefore, there is less incentive to invest in low-carbon technologies. And the methodological uncertainties bring about risks for trading. And there are also many risks for governance. If governance is not reformed, REDD would benefit wealthy elites. It would probably exclude even further rural communities from forest management, from accessing and benefiting from forest resources. The outcome will be stakeholder conflict. Of course, there are opportunities.

I just wanted to give one figure to give us a sense of the fact that forest conservation is not just about money. We have had over USD1 billion invested in development assistance in Indonesian forestry in the past two decades by more than 40 donors and Japan, of course, is a major donor. Forests continue to be lost at a rate of about 1.8 million hectares a year in Indonesia. It's not just about money. Fortunately many countries, international NGOs, local NGOs, and multilateral organizations recognize the significance of reforming governance and we have initiatives underway to reform forest governance that can inform REDD.

Reformation of governance – requiring proactive participation by local communities

I just want to highlight some of the lessons we can take from these initiatives. First of all, we shouldn't leave REDD design at the national level just up to governments or to project designers. We should be employing meaningful multi-stakeholder processes to both design and implement REDD. REDD will require clear and secure tenure for local stakeholders so we have to look at reforming tenure. People are talking about who will own the carbon rights? What benefits will there be for communities? **We have to go beyond benefits to think about meaningful**

participation so local communities – local people – have a sense of ownership for REDD.

And how can they participate? They can participate through controlling access to forests. We see this already through many formal community-based forest management programs in countries in our region. We also know from piloting that communities and local people even with a very low level of formal education could be involved in measuring and monitoring carbon stocks. **We see that too much of the discussion at the moment is on very highly technical solutions. Let us look at the fact that we have got millions of local people living next to forests or in the forests in our region** and think how we can mobilise those communities to manage forests for climate mitigation.

Prof. Amano talked about locating REDD within the broader concept of sustainable forest management. Forests have many functions. We do have standards that can be used for designing projects, designing REDD as well to meet these functions. Not just climate mitigation but the interest of communities, of industry and of other interests. And, of course, there are synergies that need to be explored.

Learn from people living in forest communities

Just to finish on a very quick note, somewhat of a personal note. Working in IGES we get the opportunity to travel to remote forest communities. And what we always notice is their lives. Their carbon footprint is so much lower than ours. And that's something that we need to very much think about. They are the most vulnerable to climate change but they are not responsible for it. We are. What are the kinds of lessons we might take from those communities? I have just listed some up here and I hope that some of these will be discussed in the following session. Thank you.

< Questions & Answers Session >

Q. During the presentation about the forestry and especially the forest management in Indonesia, I would like to ask some questions about the effects of El Nino and the Indian Ocean Dipole on the forest management itself. Because from the scientific field we noticed that once the El Nino or Indian Ocean was occurring in the Pacific Ocean or in Indian Ocean, it could increase the risk of forest fire in the region of Southeast Asia– for instance, in year 2006, we had a few thousand forest fires just in Southeast Asia region due to the Indian Ocean Dipole.

A very important component to be considered in the whole forest management system is that you should have an early warning system. You should give the information from the state to the local people and tell the communities to be more prepared in the case of such an event. It is predicted that the Indian Ocean Dipole is coming back in 2008. And at the moment still no early warning has been given to the society. So I think we should be very much prepared, for instance, and try to develop such early warning. All this information should be given to the governments, to local level so that people can be prepared for further destruction and prevent further burnings on the forest or land clearing. In this way, we can have better management and more effective reduction on the GHG emission in especially Southeast Asia region at this time.

A. It's a very good point and I agree entirely with what you are saying here. Forest fires have sort of disappeared off the agenda a little bit. And it's a very big mistake and they have to be put back on the political agenda. And the information that I got from Papua New Guinea as well shows forest fires are a major concern there. They have been a major cause of forest destruction. And again - you mentioned El Nino - in Papua New Guinea as well the forest fires are associated with El Nino. And then, of course, early warning, engaging communities, setting up a structure right down from central government to local level is going to be very critical. So it will be very interesting as well to hear what UNU is doing in the future in this area.

Panel 2 :

Approaches to Low Carbon Society for Asia and the Pacific

Taka Hiraishi (Moderator)

Hoi-seong Jeong

Shuzo Nishioka

Masakazu Ichimura

Ancha Srinivasan

Yuji Mizuno

Panel Session 2: Approaches to Low Carbon Society for Asia and the Pacific

The term “low-carbon society” comes up, especially recently, in discussion of year 2050 targets, but it is of course insufficient to take the low-carbon society as merely a long-term concern looking ahead to 2050. It is an issue we must begin acting on soon if we want to achieve our 2050 targets.

Moderator

Taka Hiraishi

Member of the Board of Directors, IGES, Intergovernmental Panel on Climate Change (IPCC), Co-Chair, Inventories Task Force Bureau

Profile

A graduate of the Faculty of Engineering and Graduate School of Science at the University of Tokyo (M.Sc. for Industrial Chemistry), Mr.Takahiko Hiraishi joined the Japanese Ministry of Labour in 1968. Moving to the newly-established Environment Agency in 1971, via the Cabinet Office for Environmental Pollution Control, he worked on a range of pollution control issues, including harmful chemical substances and water pollution. After postings to the Japanese Embassy in Kenya and the OECD, he worked for the UN Environment Programme (UNEP) from 1989 to 1998 and held positions such as director of the Environmental Assessment and Information Office. In 1999 he joined IGES as a Senior Consultant, and became involved with the Intergovernmental Panel on Climate Change (IPCC). As Co-chair of the IPCC Task Force on National Greenhouse Gas Inventories, he is currently the sole Japanese member of the IPCC Bureau.

- The temperature rise in Korean peninsula during the last 100 years is **two times higher than the global average and the rise in sea level is three times higher.**
- We have three major objectives in the 4th plan. The first is to set short-term sectoral targets, followed by **mid- and long-term national targets.**
- The Korean government considers the nuclear power generation **a key alternative towards the carbon-free economy**
- A master plan for the climate change adaptation is under study and **the climate change impact assessment systems may be introduced.**
- This fall, the Congress can enact **the Climate Change Act** that contains clauses on GHG reduction, climate change adaptation, technological development, provision of resources, and emission trading skills etc.
- Gwangju Metropolitan City, one of the most liberal cities in Korea, has already introduced **a carbon banking system**. The environmental NGOs in the city have a responsibility to educate citizens on the programme.
- You may know that Yosu City in Cholla-namdo Province is hosting an Expo in 2012. To successfully host the Expo, the city and South Cholla Province have also adopted the idea of **a carbon-free Expo** and drafted various programmes.

Climate Change Policy in Republic of Korea

Hoi-seong Jeong

President, Korean Society of Environment Policy and Administration

Profile

Dr. Hoi-seong Jeong graduated with a Bachelor's degree from the Department of Business Administration at Yeungnam University, Republic of Korea, in 1978, and went on to gain a Master's degree in Urban Planning from the Department of Environmental Planning, Seoul National University in 1981 and then in 1992, a Ph.D. in Policy Analysis from the Public Policy Program, West Virginia University, where he was also a teaching assistant. He joined the Korea Environmental Technology Research Institute (KETRI) in 1993, first as a Research Associate and then as a Senior Research Fellow when the Korea Environment Institute (KEI) was formed. At KEI, he has held positions including Director of Environmental Policy Research Division and Chief of the Environmental Policy Team, and became President of KEI in 2007. He also spent a year as visiting scholar at Maryland University at College Park, in the US. In 1998, he was awarded the Prime Ministers' Commendation for Meritorious Environmental Researcher on World Environment Day. He has had many books and research papers published over the years.

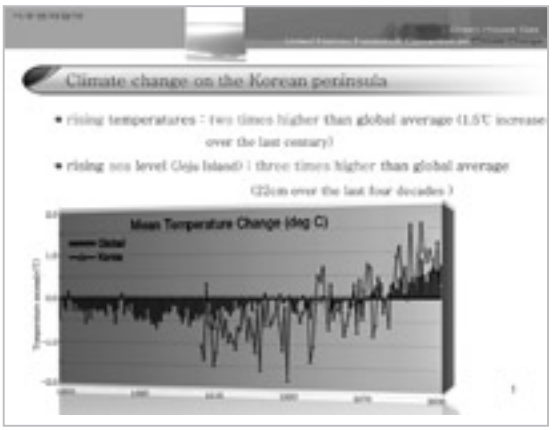
Climate Change Policy in Republic of Korea

Hoi-seong Jeong

President, Korean Society of Environment Policy and Administration

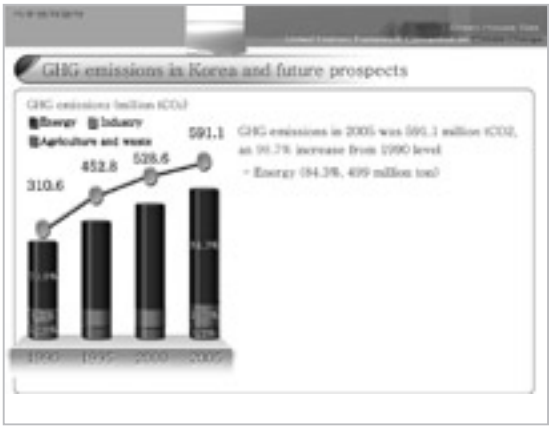
Vulnerability to climate change

The Republic of Korea is one of the most vulnerable countries to climate change. **The temperature rise in Korean peninsula during the last 100 years is two times higher than the global average and the rise in sea level is three times higher.** While, the Korean economy is very energy-intensive. The increase rate of GHG (greenhouse gas) emissions is fast compared with other OECD countries. Due to the economic structure, Korea will confront lots of problems when she tries to reduce the volume of GHG in the near future.



Approaches started in the mid-1990s

Korea's effort to address the climate change issues started in the mid-1990s. In 1999, Korea drafted the 1st Comprehensive National Action Plan for Climate Change Conventions, mostly emphasising voluntary energy saving programmes. With the action plan, policies were introduced from the perspective of reducing energy use and increasing energy efficiency. Three years later, Korea revised the comprehensive plan and introduced the 2nd Comprehensive National Action Plan. At that time Korea tried to integrate the climate change programme with energy saving and the environmental management programmes.



In 2005, Korea introduced the 3rd Comprehensive National Action Plan. The 3rd plan emphasised the participation of local government into the climate change policy actions. Gradually, environmental NGOs started to pay attention to the GHG reduction. For example, the Environmental Fund, a famous environmental NGO in Korea, established climate change centres last year and then tried to educate residents and local governmental officers.

The 4th plan: A balanced approach

This year we are preparing the 4th Comprehensive National Action Plan for Climate Change. The plan may be finished by the end of June 2008 and this time we have changed the time span, extending it from three years to five years. Therefore, the target year for the 4th plan will be 2012. **We have three major objectives in the 4th plan. The first is to set short-term sectoral targets, followed by mid- and long-term national targets.** The second objective is to minimise social, economic, and environmental damage through adaptation policies. The third is to secure GHG reduction technology. One of the main features of the fourth plan is the balanced approach between these three objectives. A feature of this plan is that it has paid much attention to adaptation programmes.

Let us look briefly the specifics of the climate change policies of Korea. For mitigation policies, we are emphasising increases in the portion of renewable energy and bio-diesel fuel in the near future, and gradually considering the expansion of nuclear power in the generation of electricity. Until now, the opposition of local NGOs to the expansion of nuclear power has been very strong. However, **the Korean government considers the nuclear power generation a key alternative towards the carbon-free economy,** and is now designing the specific GHG emission reduction target for each industrial sector and public organisation; we are also pushing hard for the GHG reductions in such sectors as agriculture, livestock farming, forestry, and waste, etc.

Korea currently realises the importance of the climate change adaptation too; **A master plan for the climate change adaptation is under study and the climate change impact assessment systems may be introduced.** The results of climate change impact assessment can be combined into the current environmental impact assessment system. As president of Korea Environment Institute (KEI), I encourage our staff to carefully examine the potential impacts of the climate change when they review the environment impact statement reports.

Korea also emphasises the importance of capacity building of both local governments and industries. To improve the capacity of local governments on climate change issues, Korean government uses regular policy consultation meetings and promotes voluntary agreements between the central and local governments to promote specific policy goals.

The research and development policy to combat the climate change problems is another core area in Korea. High priority is given to such fields as increasing the share of investment and research funds, preparing mid- and long-term principal technology development, and developing roadmaps for research and development on climate changes. Improving nuclear power technologies is included in the core research agenda. R&D on alternative energy technology is another major issue to which has high priority.

Major institutional re-arrangement

To push these various climate change programmes successfully, Korea is considering major institutional re-arrangement. There are hot debates on the enactment of the Climate Change Act. **This fall, the Congress can enact the Climate Change Act that contains clauses on GHG reduction, climate change adaptation, technological development, provision of resources, and emission trading skills etc.** In fact, the coordinator of climate change policies in Korea is the Prime Minister. The Prime Minister's office has a committee on countermeasures for climate change. The PM is the chair of the committee and all economy-related ministers are members of it.

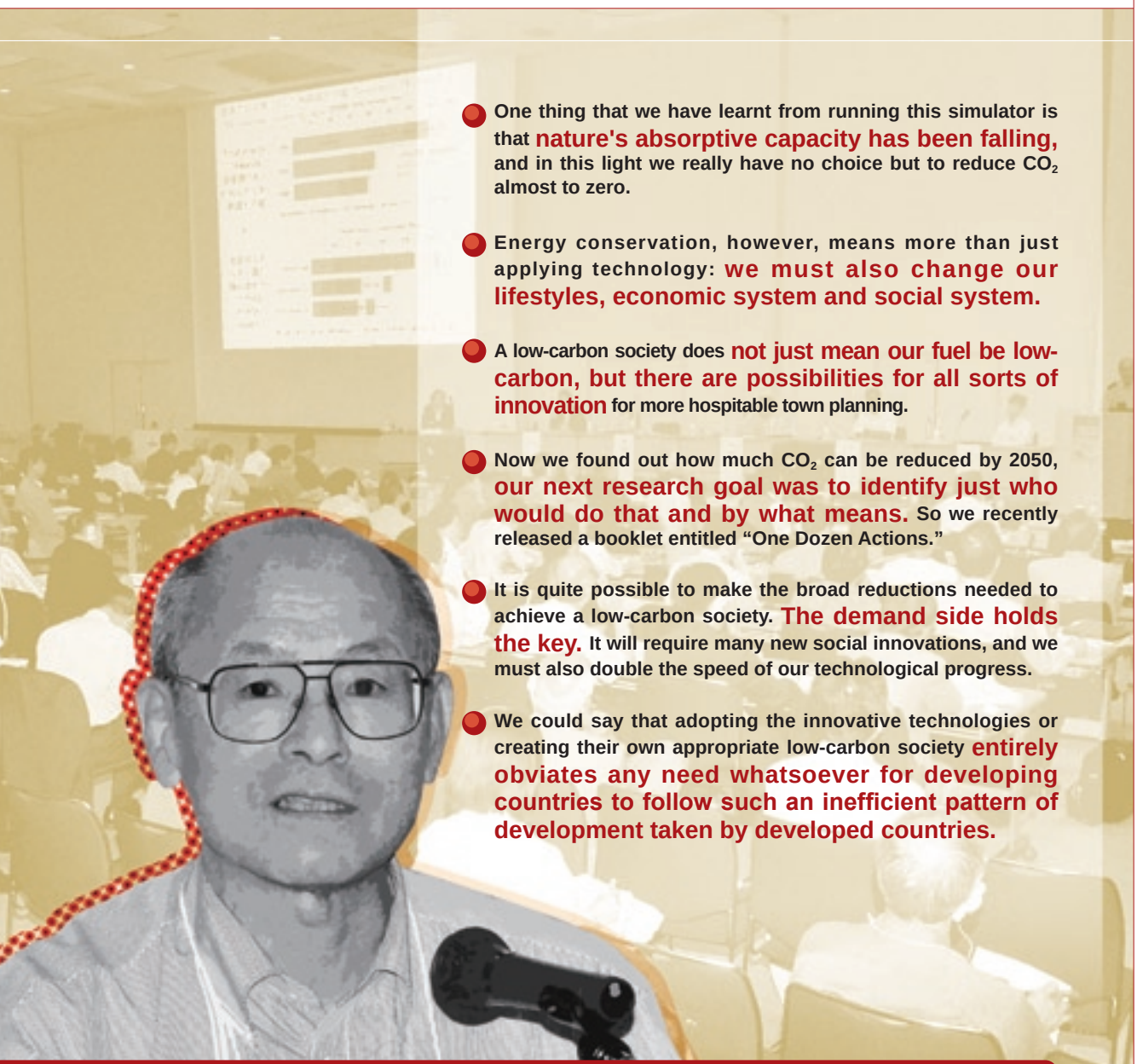
There are several working-group level task forces under the committee.

Another measure under debate in Korea is the introduction of carbon tax and transport energy environment tax. Actually the debate on the introduction of carbon tax started in the late 1990s in Korea. The Kim Dae-jung administration planned to introduce the carbon tax in early 2000. But the next government, the Rho Moo-hyun administration postponed its introduction due to the strong opposition from business communities. Now the idea of introducing this tax system has been revived.

Advanced initiative by local government

Let me briefly introduce local government programmes in Korea. **Gwangju Metropolitan City, one of the most liberal cities in Korea, has already introduced a carbon banking system. The environmental NGOs in the city have a responsibility to educate citizens on the programme.** The city also set a 10 % GHG reduction target over the next ten years, ahead of the national government position.

Another interesting local government programme is the Individual Emission Trading Programs that Gwacheon City in Gyeonggi Province has initiated. This programme is intended to change the consumption pattern of residents by calculating the use of electricity and electronic equipments in terms of climate change contribution. **You may know that Yosu City in Cholla-namdo Province is hosting an Expo in 2012. To successfully host the Expo, the city and South Cholla Province have also adopted the idea of a carbon-free Expo and drafted various programmes.** Thank you for your attention.



- One thing that we have learnt from running this simulator is that **nature's absorptive capacity has been falling,** and in this light we really have no choice but to reduce CO_2 almost to zero.
- Energy conservation, however, means more than just applying technology: **we must also change our lifestyles, economic system and social system.**
- A low-carbon society does **not just mean our fuel be low-carbon, but there are possibilities for all sorts of innovation** for more hospitable town planning.
- Now we found out how much CO_2 can be reduced by 2050, **our next research goal was to identify just who would do that and by what means.** So we recently released a booklet entitled "One Dozen Actions."
- It is quite possible to make the broad reductions needed to achieve a low-carbon society. **The demand side holds the key.** It will require many new social innovations, and we must also double the speed of our technological progress.
- We could say that adopting the innovative technologies or creating their own appropriate low-carbon society **entirely obviates any need whatsoever for developing countries to follow such an inefficient pattern of development taken by developed countries.**

A Dozen Actions towards Low-Carbon Societies

Shuzo Nishioka

Senior Research Advisor, IGES; Senior Visiting Researcher, National Institute for Environmental Studies (NIES)

Profile

Dr. Shuzo Nishioka graduated from the University of Tokyo with a Ph.D.(Mechanical Engineering). After 12 years of engaging in petrochemical and energy-related engineering and in corporate planning work with Asahi Chemical Co., he joined NIES as Senior Researcher and engaged in environmental system research area, such as urban transportation, nature conservation and climate change. He then joined the IPCC from 1988, serving mainly in development of methodology for assessing climate change impacts and adaptation. He also held a position as the leader of IGES Climate Policy Project for 6 years. In addition, he was a professor at the Tokyo Institute of Technology and Keio University (Global Environmental Policy) from 1997-2001. From 2001 to 2008, he worked as Executive Director of NIES. He is now leading the "Japan Low Carbon Society 2050" project under Global Environmental Research Program of the Ministry of Environment, and the "Innovative climate modeling" project under the Ministry of Education and Science.

A Dozen Actions towards Low-Carbon Societies

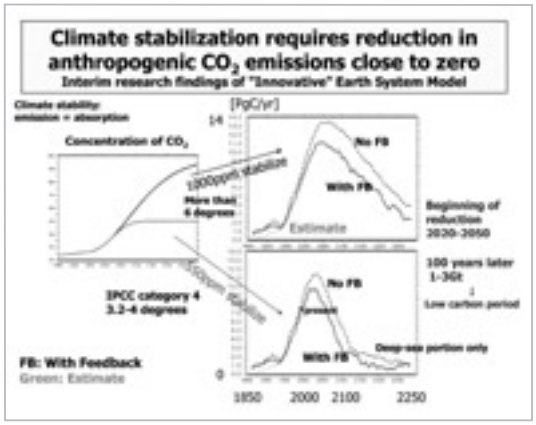
Shuzo Nishioka

Senior Research Advisor, IGES; Senior Visiting Researcher, National Institute for Environmental Studies (NIES)

I will speak to you today on a dozen actions towards low-carbon societies. I wear three hats in my professional life. At IGES I tend to work on policy, at the National Institute for Environmental Strategies (NIES) I do engineering, and at Japan Agency for Marine-Earth Science and Technology (JAMSTEC) in Yokohama, I oversee computer research together with Prof. Matsuno.

Things we have learned from an Earth simulator

In JAMSTEC, we are now using an Earth simulator to run the world's leading climate model. We are going beyond just the physical status of oceans and the atmosphere to prepare a large model for the next IPCC report that includes a wide range of chemical processes and even simulates individual trees to gauge how much they absorb. Although this remains extremely preliminary, **one thing that we have learnt from running this simulator is that nature's absorptive capacity has been falling, and in this light we really have no choice but to reduce CO_2 almost to zero.**

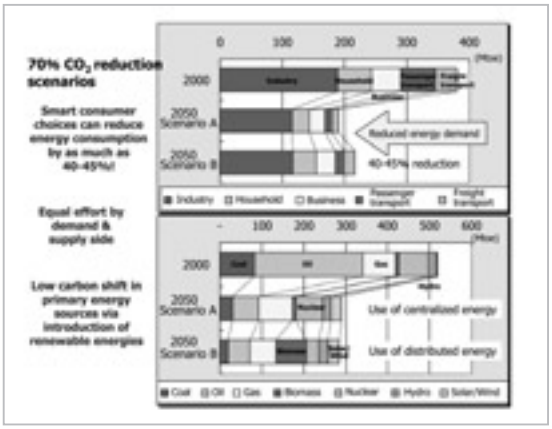


Even if we were to limit the increase of CO_2 emissions to 550 ppm and the temperature increase to 5°C, the temperature rise would release CO_2 from the ground or CO_2 would be absorbed less in the ocean. Even if we try to hold it at 5°C, absorptive capacity rapidly deteriorates and absorption volumes fall. So one thing we have learnt from the results of this simulation is that we need to reduce emissions to stabilise the climate in consideration of such decrease of absorption capacity caused by temperature increase. We can look at the situation in long-term, hundred-year units. We are now emitting seven giga-tonnes of carbon equivalent globally, but the absorption is three giga-tonnes. The gaps have been growing. Considering the decrease of absorption, we need to turn these seven giga-tonnes into two to achieve within 5°C. There is talk of halving it, but thinking in the long-term, we realise that in fact this is not enough. This makes it imperative to work towards achieving a low-carbon society from the scientific point of view.

Reduction possibility

The term "low-carbon society" appeared in the vision announced by former Prime Minister Fukuda on 9 June in which he declared that Japan would seek to reduce greenhouse gases by 60% to 80% by 2050. NIES has for some time pursued research indicating that it will be possible to achieve a 70% reduction by 2050. To reach this goal, we have reported we will achieve considerable savings through **energy conservation as well as clean energy supply. Energy conservation, however,**

means more than just applying technology: we must also change our lifestyles, economic system and social system. I would like to address how we can work toward these goals as follows.

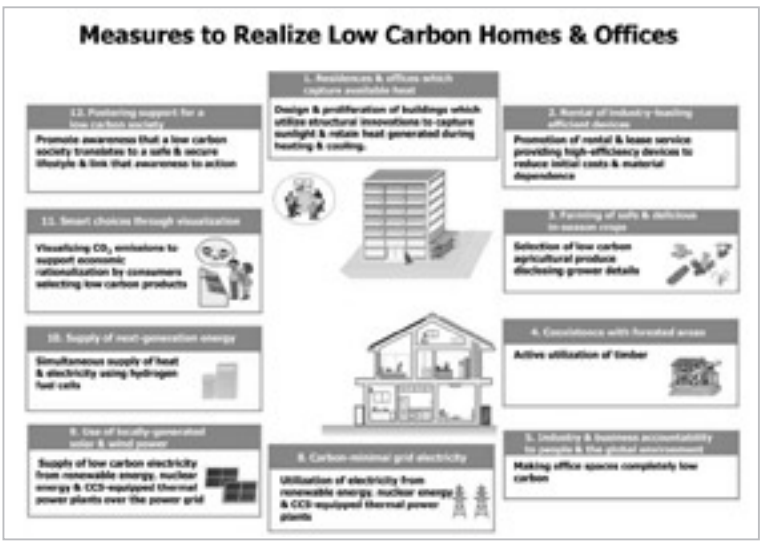


Japan is capable of achieving a 70% reduction in CO_2 by 2050, and it will cost us about one percent of GDP. Regarding energy demand and supply, we can devise two scenarios for that in 2050. If we forecast an appropriate increase in GDP, which is one or two percent of annual GDP per capita (Scenarios A and B), we are capable of achieving 40-45% reduction at the demand side. At the supply side, we have to make our power and fuel sources low-carbon ones which are reduced at the demand side. My point is that both approaches are very much needed.

We are submitting both scenarios A and B as research results of reduction possibility. While GDP itself will rise, population may fall and reduction is possible. Industry and motorisation must also change, and our transportation systems must shift to more public transport. This will require us to make early investments in infrastructure, and if we do so I believe we need not particularly constrain the volume of services we demand such as for light, warmth or transportation. **A low-carbon society does not just mean our fuel be low-carbon, but there are possibilities for all sorts of innovation for more hospitable town planning.** I expect we will of course include natural energy sources and also will need to introduce nuclear power as appropriate.

One Dozen Actions

Now we found out how much CO_2 can be reduced by 2050, our next research goal was to identify just who would do that and by what means. So we recently released a booklet entitled "One Dozen Actions."



One Dozen Actions include, for example a "Comfortable & Green Built Environment." which shows ideas how we can conserve energy at home, the greatest locus of consumer energy usage. One idea was to adopt a leading runner strategy, looking at apparatus such as refrigerators and air conditioners. We will also have to think about people who look after the land. In other words, we must think about the form of agriculture, such as local production for local consumption or seasonal

production for seasonal consumption. In addition, we need to bring forests conservation into our thinking, the forest that were discussed earlier today. Industry and business will of course have to become environment-oriented. Town planning will be important, and we will also need low-carbon line power. We will need to make evermore use of natural energy sources. In addition to these, there are challenges of how we disseminate information to people and how we make them aware of low-carbon society. We address all these matters in the 12 actions.

The "Comfortable & Green Built Environment" concept consists of progressively taking on building functionality that applies structural stratagems to trap heat. If we think about how far we can go in making our homes and offices low-carbon in this first measure, this only becomes possible when the whole 12 actions are combined and integrated. It is not at all about just improving insulation; this report shows a mixture of various measures will work effectively. The report also proposes to make the equipment we put in the buildings as high-performance as we can, and to rent it in cooperation with business society, if possible, since once you install equipment it is difficult to then replace it. It also shows the way we can do timber construction so that forest lands can recover. Other proposals are to develop information availability so that consumers buying homes or equipment can recognise how low-carbon they are, and push forward other things like this.

Quantification of results and a “Gatt Chart”

We performed a model calculation of how components link together and how much reduction is achieved by each component. It indicates how we can manage at 30% of the 2000 level of CO_2 emissions and we can see where we ought to be making our efforts. For consumers, for example, we have opportunities of emissions reduction of 50 to 60 million tonnes and about 30 million tonnes for industries. There is also possibility of about 80 million tonnes reduction at the supply side by energy conversion and other measures. Thus, the effort needed in each sector is identified in quantitative terms.

In addition, we have prepared a “Gatt Chart”. What should we be doing and in what sequence? We might think that we would like to do this or that, but we face many barriers. Some barriers are institutional and some are technological. The chart is a kind of roadmap. Working backwards from the clear goal in 2050, it identifies the expected barriers and how we can overcome each of them. It shows the steps we need to take and when, concretely one by one. If we do things in sequence, we find that it is just about possible to achieve a 70% reduction.

What I've been saying is that **it is quite possible to make the broad reductions needed to achieve a low-carbon society. The demand side holds the key. It will require many new social innovations, and we must also double the speed of our technological progress.** It is not an easy task, but we can do in comprehensive, synergistic and sequential manners.

Shared wisdom required

Finally, I would like to briefly address what sort of cooperation we will need in Asia. First of all, we will need to share wisdom. The term "sector-specific approach" is frequently used today, and in this approach, we can share with others where best to concentrate reductions, that is very important information. Another thing is that we should construct a research network to work on the low-carbon society.

In this sector-specific approach, when we apply present Japanese technologies in countries around the world, we can realise the potential for reductions, and where they can be achieved. China and

India, as well as US have many opportunities for reductions especially in the field of industrials and power generations. Since in China, for example, current energy efficiency is not very good, introduction of the technologies at the same level as Japan will make profits through energy saving. If people are going to say they can't do it because of money, we can finance them. In this way, I think we should be able to share wisdom and cooperate with each other in the region.

Transformation to a new, low-carbon society

Finally, there is the question of whether developing countries must follow the pathway of developed countries in order to shift to a low-carbon society. Past examples show this not to be the case. After 1860 the UK as a nation was developing but its energy efficiency was deteriorating. Following this, the US also became developed while its energy efficiency gradually deteriorated, but due to its technological capability the rate of energy efficiency is now improving further and further. France and Germany caught up, and in the 1970s Japan leaped to the top of the energy efficiency ranks. Now, looking at the Republic of Korea's data, it has now almost reached the level of Japan. Taking this approach, **we could say that adopting the innovative technologies or creating their own appropriate low-carbon society entirely obviates any need whatsoever for developing countries to follow such an inefficient pattern of development taken by developed countries.** Japan too has the confidence of having done this. We would like to promote cooperation in our quest to build a new form of low-carbon society, a low-carbon world.

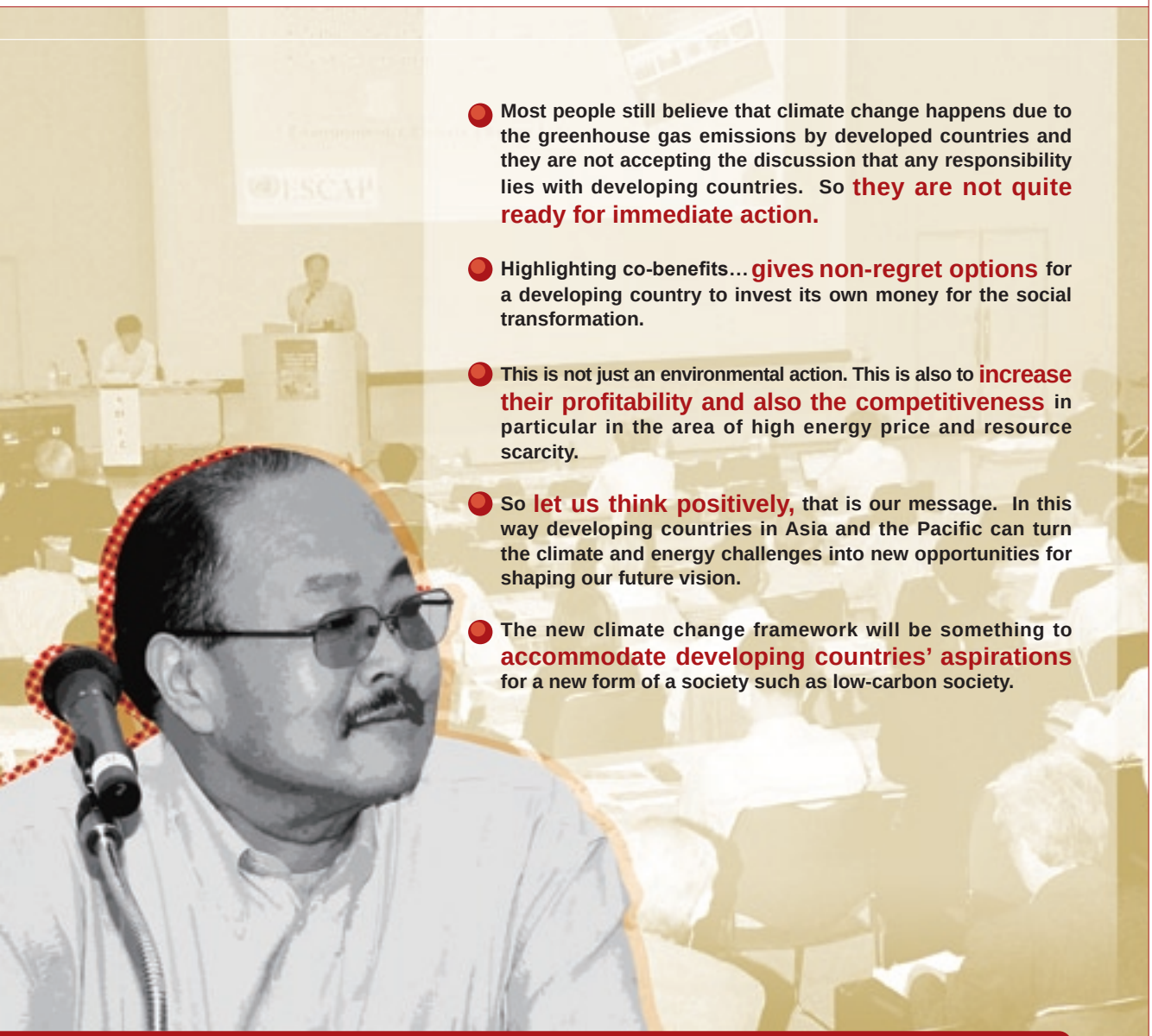
A meeting of environment ministers was held in May 2008 in Kobe. There, there was a proposal of building a research network on a low-carbon society. It will look into what low-carbon society would look like, how individual countries imagine it, what we ought to do in order to achieve it, and what sort of knowledge we should share. This encompasses both developed and developing countries, and Japan in particular (IGES/NIES) is well placed to create the nucleus of the network. I hope that visitors from overseas would also participate in such an endeavour. And with that I would like to conclude my talk.

< Questions & Answers Session >

Q. Can we head off the melting of Himalayan glaciers? If they all melted, I expect it would cause extensive damage to Asia and throughout the world in terms of water and food security. I'd like to ask whether your findings take account of whether these strategies will be able to absorb the melting of the Himalayan glaciers. How do you see this playing out?

A. As I'm sure you're well aware, the Himalayan glaciers are melting already. The IPCC report, for one, certainly makes the point that this is bringing about a tremendous change in seasonal flow volumes and that there is not enough water available in summer, just when it is most needed. As the source of four of the great Asian rivers -- the Yangtze in China, the Mekong, the Indus and the Ganges -- the Himalayas are of tremendous significance.

And the situation with warming is that, even if we take steps to address it, temperatures will rise by around 0.4°C over the next 20 to 30 years. Inertia is a factor here, and it would be extremely difficult to halt. Therefore I believe there is a considerable need for adaptation. Although I expect it will stabilise at some point over the long term, if that stabilisation comes with higher temperatures, I think we will have to be prepared for a considerable drop in capabilities as a water source and as snow dams.



- Most people still believe that climate change happens due to the greenhouse gas emissions by developed countries and they are not accepting the discussion that any responsibility lies with developing countries. So **they are not quite ready for immediate action.**
- Highlighting co-benefits… **gives non-regret options** for a developing country to invest its own money for the social transformation.
- This is not just an environmental action. This is also to **increase their profitability and also the competitiveness** in particular in the area of high energy price and resource scarcity.
- So **let us think positively,** that is our message. In this way developing countries in Asia and the Pacific can turn the climate and energy challenges into new opportunities for shaping our future vision.
- The new climate change framework will be something to **accommodate developing countries' aspirations** for a new form of a society such as low-carbon society.

ESCAP Promotes Shift towards Low Carbon Society

Masakazu Ichimura

Chief, Environment Section, Environment and Sustainable Development Division, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

Profile

Mr. Masakazu Ichimura graduated from the Faculty of Urban Engineering, Graduate School of Engineering, University of Tokyo. From 1988 to 1995, he served as Programme Officer, UN Environment Programme dealing with international information transfer in the field of industrial pollution control and environmental management. He worked for the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) as Environmental Policy Expert, from 1999 to 2002, and engaged in multilateral environmental cooperation initiatives both at regional and subregional levels. During 1995-1999 and 2002-2005, he worked as an environmental cooperation specialist for international programmes operated by Japanese institutions, including Overseas Environmental Cooperation Centre and Institute for Global Environmental Strategies, covering specific areas of climate change, transboundary air pollution, water resources management, nature conservation, desertification control, conflict prevention and poverty alleviation, as well as development of long-term perspective and policy integration in these areas. He has been Chief of the Environment Section, Environment and Sustainable Development Division, UNESCAP since 2005.

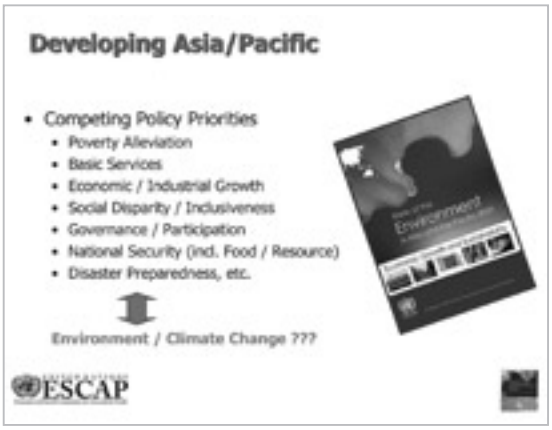
ESCAP Promotes Shift towards Low Carbon Society

Masakazu Ichimura

Chief, Environment Section, Environment and Sustainable Development Division, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

UNESCAP stands for UN Economic and Social Commission for Asia and the Pacific. This is the United Nations' biggest socio-economic development forum in Asia and the Pacific. And as the name shows ESCAP is not an environmental agency. We have UNEP in UN system and we have also UNFCCC secretariat to deal with the international negotiation about climate change. But I think as the subject of low-carbon society is concerned, ESCAP is very well placed to provide a holistic approach. Because climate change policy and actions should eventually involve everybody and every sectoral policy beyond the environmental sectoral policy.

Environmental issues in Asia



For Asian Pacific developing countries, through our experiences, our understanding is that the main priority is on social and economic fundamentals such as poverty alleviation and basic services and so on. Unfortunately, environmental issues including climate change are not necessarily the top priority at the present moment. But we do see the recent progress that the political leaders in Asian Pacific countries increasingly recognise that climate change is more than an environmental issue as it impacts on socio-economic fundamentals such poverty issues, social issues, basic services. So the recognition level is enhancing, but **most people still believe that climate change happens due to the greenhouse gas emissions by developed countries and they are not accepting the discussion that any responsibility lies with developing countries. So they are not quite ready for immediate action.** This is unfortunate but this is a quite realistic assessment about present situation.

So what can we do to promote the shift to a low-carbon society in Asian Pacific developing countries? Well, of course, one way is to agree upon a legally binding action target for developing countries. But this is a highly political issue and we have to watch the development in the UNFCCC process such as Bali Action Plan, Bali Road Map. And quite honestly it does not seem to be that easy nor that straightforward. So apart from the discussion about the legally binding target, we are looking at several alternative ways to facilitate climate action in developing countries, and particularly possibilities in mobilising mainly voluntary action in two tracks of approach. The first one is providing the incentive mechanism. Of course, no doubt this is useful and maybe effective. But also just like a discussion on the legally binding target, it is quite political and there is still a lot of discussion going on about who should take the financial responsibility.

Co-benefits: to present non-regret options

Another option is to highlight co-benefits. We see this as more promising because this is mainly the way to mobilise developing countries' own action with their own political decision. In short, **highlighting co-benefits** means that, if actions to respond to climate change have already simultaneous benefit in developing countries in meeting socio-economic development needs, then that **gives non-regret options for a developing country to invest its own money for the social transformation.**

Actually I wanted to start with taking the example of building sector, but this was already covered by Nishioka-sensei. But in short, energy efficiency improvement can be achieved in the residential sector or building sector by modernising heating and lighting systems and air-conditioning systems in some cases, and introducing better insulation as well. This gives a great opportunity for cutting down energy consumption. It leads to air pollution abatement as well as greenhouse gas emission reduction. And it also impacts local health condition, working environment and many other socio-economic co-benefits.

Our demonstration project in Mongolia

In the past, ESCAP conducted several pilot studies. I will just take one example from our demonstration project in Ulaanbaatar (Mongolia). With a very simple intervention we proved that the payback period for their own investment is just a few years. So this is very useful investment for them. We have even assisted the emergence of first ESCO business in Ulaanbaatar through our demonstration project. For industry, application of the cleaner production approach options and measures would be very useful. Because instead of controlling industrial pollution by treatment equipment, industrial managers can review the efficiency of production process and improve their productiveness with those simple interventions. So **this is not just an environmental action. This is also to increase their profitability and also the competitiveness in particular in the area of high energy price and resource scarcity.**

I do not think I have to go through all the sectors. But we have some examples. We have some reports to evaluate the potential of co-benefit approach. For example, one is in the sector of solid waste management and we are also preparing another report on transportation. Public transportation is a very good low energy consumption alternative to private transportation system. And I think Japan can provide a very good example for that.

A great chance for social transformation

Altogether those co-benefit approaches can be applied at different level and scales from project level, local level, and national, and even for society levels. And from ESCAP's point of view, I also want to highlight that this is a great chance for social transformation for most of the developing countries. Respond to economic and social challenge and eventually build a healthy, stable, and barrier-free society for all people including youths, women, the aged and handicapped. **So let us think positively, that is our message. In this way developing countries in Asia and the Pacific can turn the climate and energy challenges into new opportunities for shaping our future vision.**

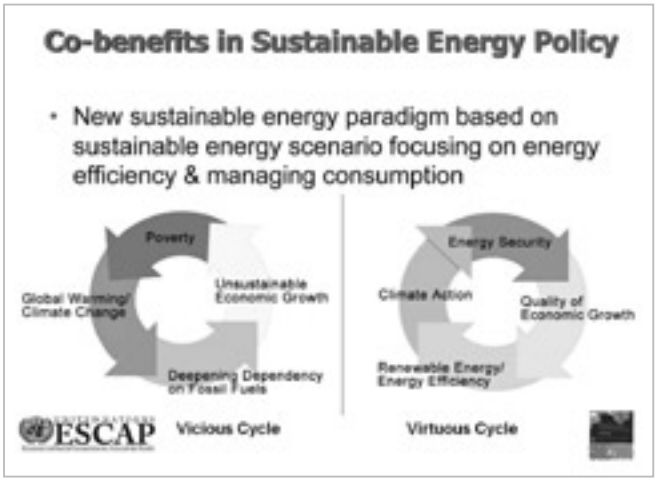
Co-benefits in sustainable energy policy

Let me touch upon just one more example of co-benefit approach at the society level. ESCAP has just completed a big flagship study on energy security and this study was submitted to our

governing body commission session in April. So, we have a lot of discussion about energy security and climate action combined with new concept of energy security. The new sustainable energy paradigm should focus on energy efficiency improvement and demand side management as well as promotion of renewable energy. With this option, we can enhance the energy security of each country, lower economic vulnerability to volatile energy prices and lessen ecological vulnerability to climate change. So this is a typical win-win (beneficial for both) situation.

If you look at two kinds of cycle, one is a vicious cycle based on the present perception about energy security which is quite harmful to the future of our region. But if we can turn it into a virtuous cycle starting with demand side management and renewable energy, then we can solve many problems common in our society.

To provide a forum for dialogue amongst developing countries



So altogether ESCAP is trying to promote the developing countries' effort to achieve a low-carbon society according to their condition. So, I just wanted to touch upon two lines of activities. The first one is our awareness raising activity targeted at the policymakers in Asian Pacific developing countries. Our role is to supply innovative policy ideas like this co-benefit approach. And we do a lot of studies to prove and demonstrate and disseminate such new ideas. Another line of activity is to facilitate their participation in designing future climate regime. Now people are talking about post-2012 Climate Framework. But **the new climate change framework will be something to accommodate developing countries' aspiration for a new form of society such as low-carbon society.** So what we are doing is to provide a forum for dialogue amongst developing countries in Asia and the Pacific.

This effort does not simply duplicate the negotiation going on under the UNFCCC process, but rather supplements and brings a lot of intellectual input to those processes. I think I have gone through everything I want to say. Thank you very much.

< Questions & Answers Session >

Q. Can we head off the melting of Himalayan glaciers? If they all melted, I expect it would cause extensive damage to Asia and throughout the world in terms of water and food security. I'd like to ask whether your findings take account of whether these strategies will be able to absorb the melting of the Himalayan glaciers. How do you see this playing out?

A. Our theme today is the low-carbon society, and this is a bit more long-term than I had expected so my presentation did not touch on it, but what the U.N. can do about such urgent challenges is of course something that we take very seriously, including disaster in Myanmar recently and the response to the Chinese earthquake.

With regard to the Himalayan glaciers, as Dr. Nishioka just said, this is something that appears to be a regional issue but is actually very wide ranging, and various U.N. organisations have come together to discuss it. ESCAP plays a coordinating role working together with a variety of Asia-Pacific bodies, and we are currently in the midst of such discussions that include the UNDP whose job will be to take action on the ground, UNEP will provide the scientific knowledge and financial institutions and the Asian Development Bank will provide finance.

But the question of what can we do where such urgent action is truly necessary involves extremely big issues that we have never dealt with. What are we going to do about glacial lakes at altitudes of over 4,000 meters, for example? There's no country anywhere with civil engineering technologies for such altitudes. Where then can we find the human and technological resources to deal with this? The debate that's taking place now is growing around the idea that we should search for them more widely than the developed countries of the world, Japan and Australia and so on. As to whether short-term action will really be sufficient, we can't say anything definite, but it is certain that this is a serious problem and that we need to start working on it.

- Asian countries should recognise **climate change as the core developmental challenge.**
- The need for taking timely climate actions **to minimise the huge costs of inaction.**
- An important thing to note here is that **there are many cost-effective climate actions which have not been realised so far.**
- Asia needs to **move from the reactive role to a more proactive role** in international climate negotiations.
- **We cannot have a low-carbon society vision that is uniform to all countries in Asia.** We need to assess national strengths and weaknesses. And ultimately we need to modify the investment and financial flows without sacrificing the developmental goals of each Asian country.
- We need to integrate adaptation concerns into development planning, and harness indigenous knowledge related to adaptation. And, of course, for all this to happen, **we need to strengthen the funding base for adaptation.**
- To strengthen **the market mechanisms so as to promote their developmental benefits.**
- **Asia should not wait for other regions to lead us** in terms of creating a low-carbon society.

Seven Key Messages on Aligning Actions on Climate and Development: Asia at the Crossroads

Ancha Srinivasan

Principal Researcher and Manager, Climate Policy Project, IGES

Profile

A Principal Researcher and Manager of the Climate Policy Project at IGES. His current research focuses on Asian perspectives of climate regime beyond 2012 and adaptation to climate change. He earned a Ph.D. in natural sciences from the University of Cambridge, UK. He contributed to international initiatives such as the Global Environmental Outlook, Millennium Ecosystems Assessment, IPCC, and others as an author or as a reviewer. He is a recipient of the Eisaku Sato Memorial Award of Excellence from the United Nations University, a letter of appreciation from the Prime Minster of India, and a Gold Medal at the Indian Agricultural Research Institute. His name has been listed in publications such as "Who's Who in the World" and "Who's Who in Science and Engineering" since 1999. He has edited 5 books, authored over 80 publications, and presented more than 100 times at national and international conferences.

Seven Key Messages on Aligning Actions on Climate and Development: Asia at the Crossroads

Ancha Srinivasan
Principal Researcher and Manager, Climate Policy Project, IGES

I would like to present seven key messages. If we want a low-carbon society in future in Asia I think that the following seven key messages are very important.

The first message is that **Asian countries should recognise climate change as the core developmental challenge.** Many Asian countries have not yet recognised this fully. And because the understanding of the climate change and its interactions in relation to food security, energy security, water security, health security, or biodiversity conservation, and even the socio-political stability, are not well-known yet so we need to enhance such awareness. IPCC has done a good job in this area by mentioning that basically there will be a 30% reduction in cereal yields, for example, in South Asia by 2050. And the prevalence of malaria or dengue fever is going to increase, thereby affecting health security. There maybe more than 25 million environmental refugees by 2025 and this can cause socio-political instability. So, the first important thing is the recognition of climate change as a core developmental challenge.

The second message is about **the need for taking timely climate actions to minimise the huge costs of inaction.** The Stern Review noted and the IPCC emphasised that the cost of action is going to be not insignificant but it is much less as compared with the cost of inaction. Such cost of inaction can be as much as loss of GDP of anywhere between 5% and 20% as per the Stern Report. There is very limited evidence on costs of impacts in Asia but new studies are coming up. For example, in Indonesia, the sea level rise may cause economic loss of as much as USD25 billion by 2100. Thus the huge costs of inaction are already pointed out. So we need to take timely action.

The third step is to harness the most cost-effective mitigation options immediately. There are many areas where such options are available. Opportunities are available in terms of energy efficiency

improvement, renewable energy promotion, realisation of the co-benefits in various non-energy sectors including, for example, forestry sector, agriculture sector, and also through promotion of synergies among various multilateral environmental agreements. So **an important thing to note here is that there are many cost-effective climate actions which have not been realised so far.** And it must be a priority action if we want to achieve the low-carbon society in future. Of course, for various reasons, those low-cost actions are not being realised and we need international cooperation to share those opportunities.

The fourth message is to ensure that the post-2012 regime duly reflects the Asian needs as well as aspirations. For this to happen, many Asian countries need to recognise climate change as a high policy priority, and reduce the gap between policy rhetoric and reality. And **Asia needs to move from the reactive role to a more proactive role in international climate negotiations.** On Page 38 of our White Paper, we proposed a multi-stage, multi-track, and all-inclusive framework to involve the developing countries with differentiated commitments and incentives. And if we want to realise a low-carbon society in Asia, we need to promote the transfer and also development of clean technologies more effectively throughout Asia. In the White Paper we have given several sector-specific as well as regional and country-specific recommendations to achieve these objectives.

The fifth key message is to promote proactive adaptation at various levels; local, national and regional level. At the regional level, especially, there are many trans-boundary issues such as water management, which need attention in terms of promoting regional cooperation. We need to look at such issues more comprehensively. Given the fact that climate-related disasters are becoming so common in Asia, perhaps we need to have a catastrophic risk insurance facility at regional level. For example, such insurance facility has been established in the Caribbean region and it is high time to have that in Asia. Japan can play a major role in leading other countries to have such catastrophic risk insurance facility with cooperation of all countries in the region. At national level, we need to have adaptation policy frameworks to climate-proof the development. And **we need to integrate adaptation concerns into development planning, and harness indigenous knowledge related to adaptation. And, of course, for all this to happen, we need to strengthen the funding base for adaptation.**

The sixth key message is to **strengthen the market mechanisms so as to promote their developmental benefits.** There is a strong criticism on current CDM that it is not contributing to sustainable development. Various reforms to CDM have been suggested such as minimising procedural complexities, enhancing multi-source funding approaches and reducing the geographic as well as sector inequity. We need to widen the scope of CDM to realise more cost-effective mitigation options and to promote the developmental dividend.

Asia should not wait for other regions to lead us in terms of creating a low-carbon society. That is the seventh point. There are many opportunities to leapfrog and for that to happen, again we need to harness the potential of traditional lifestyles of Asia. We need to look at how we can incorporate the low-carbon lifestyles in the modern living. Also we need to promote a new set of carbon standards and reassess the alternative energy potential in each country's context and develop a low-carbon vision for each country. We cannot have a low-carbon society vision that is uniform to all countries in Asia. We need to assess national strengths and weaknesses. And ultimately we need to modify the investment and financial flows without sacrificing the developmental goals of each Asian country.

And finally, the message of our White Paper is to align the climate and development actions.

Rather than treating them separately, we need to have integrated developmental and climate actions. Japan and Japanese citizens have a strong role to play in facilitating this action throughout Asia. Thank you very much.

< Questions & Answers Session >

Q. Can we head off the melting of Himalayan glaciers? If they all melted, I expect it would cause extensive damage to Asia and throughout the world in terms of water and food security. I'd like to ask whether your findings take account of whether these strategies will be able to absorb the melting of the Himalayan glaciers. How do you see this playing out?

A. Basically I think that melting of glaciers cannot be stopped in the short to medium term. The only steps that can be done are how effectively we can make use of this glacier water in terms of enhancing our hydro energy production or addressing the potential impacts of those sudden floods. In the next 20 or 25 years, floods are going to increase. And, of course, Bangladesh has so much experience in that and it is going to happen in other countries also, in Nepal or Bhutan or India. So the first thing is to address regional energy cooperation on the mitigation side and promote regional cooperation in adaptation in terms of coping with floods. I think those two actions need to be addressed as a high priority. And some of those ideas have been touched very briefly in our White Paper.

- At this moment, we could expect the worldwide issue of credits **sufficient enough to offset one year's worth of Japanese emissions.**
- To get to this point, however, **took all of ten years and the efforts of massive numbers of people.** The documentation alone runs to tens of thousand of sheets.
- Now, we are beginning to face a new challenge, none other than **the post-2012 CDM.**
- Japan, as the country that is the world's largest buyer, can make **proposals for improvements from the purchaser's point of view.**
- Both developing and developed countries benefit, but as the two parties each pursue their own interests, **there is one loser and that is the global environment.**
- What the post-2012 framework will need is **a system for both developed and developing countries to contribute to the sustainable global environment.**

The Challenge of the CDM in Asia

Yuji Mizuno

Senior Expert and Manager, Market Mechanism Project, Climate Change Area, IGES

Profile

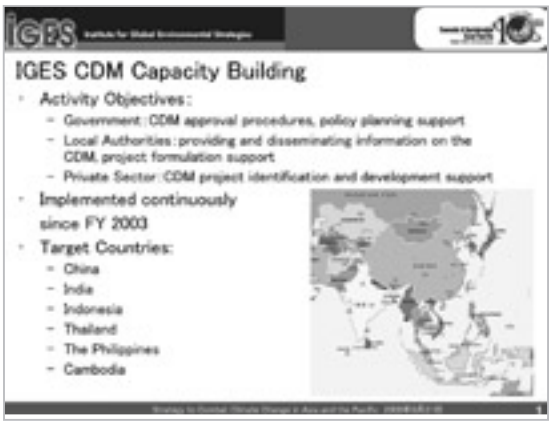
After graduating from the Graduate School of Waseda University in Applied Chemistry, Mr. Yuji Mizuno worked for major think tanks from 1988 and dealt with research projects on carbon emissions trading, carbon tax, international negotiation for climate change, information exchanging and domestic policy for climate change. He has been involved in CDM related consulting since 1999. He joined IGES in 2007 and his major publication is the “CDM in Charts” series.

The Challenge of the CDM in Asia

Yuji Mizuno
Senior Expert and Manager, Market Mechanism Project, Climate Change Area, IGES

What is the CDM? The CDM is the Clean Development Mechanism, a regime newly introduced with the Kyoto Protocol eleven years ago. A developing country reduces its greenhouse gases -- generates emission reduction credits and gains the ability to offset them against the volume of Japanese emissions. This entails all sorts of procedural formalities, and that is where the CDM comes in.

Implementation of a new mechanism



At IGES we have conducted a CDM "capacity building" programme which supports the building-up of foundations for implementing this new CDM scheme in developing countries in Asia. What generally happens between developed and developing countries is that developed countries transfer to developing countries things that the developed countries know about. However, we were not actually aware of CDM either. So, it was a tremendous challenge to work together with people from developing countries to conceive and implement things that had not been known to anyone at all, but we found it a great pleasure when we did overcome the difficulties.

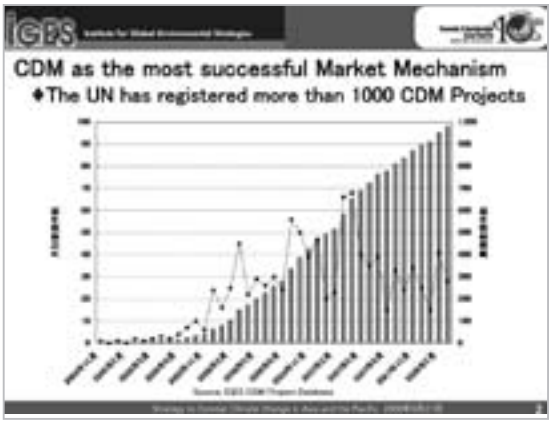
IGES started its CDM capacity building programme in 2003. Although, untill 2005, hardly any had been up and running because of being in the period of labour pains, now there are over 1,000 CDM projects underway, a tremendously large number. **At this moment, we could expect the worldwide issue of credits sufficient enough to offset one year's worth of Japanese emissions.** Since eighty percent of that is from Asia, people may call CDM an Asian instrument, but rather than Asia on the whole, the fact is that most of this comes from just two countries, China and India.

As I mentioned earlier, no such system had been present in either developing countries or in developed countries for that matter. That the CDM has been a success with the use of market mechanisms is something I personally consider a real breakthrough. **To get to this point, however, took all of ten years and the efforts of massive numbers of people. The documentation alone runs to tens of thousand of sheets.** Thus, this massive amount of documentation has contributed to the launch of the international regime.

Towards the post-2012 CDM

Now, we are beginning to face a new challenge, none other than the post-2012 CDM. It is still

in part a question of whether the CDM will actually survive, but it is difficult to imagine that its success and the tremendous efforts that have gone into it will disappear entirely. At the same time, however, many different people are putting forward proposals for improvement, and I myself consider the CDM to hold a wide range of problems. This makes it unthinkable that the post-2012 system will be just like the one we have now, and this is why we are now, once more starting out on a new worldwide challenge.



Many of the CDM projects are in fact in Asia, especially in China and India, and with this regional experience I think that **Japan, as the country that is the world's largest buyer, can make proposals for improvements from the purchaser's point of view.**

To give one example, the CDM is what we call a "Win-Win" approach, as developing countries are able to sell their credits within the system and developed countries are able to use those credits to meet their Kyoto Protocol targets. **Both developing and developed countries will benefit from the CDM, but if the two parties each pursue their own interests, there is one loser and that is the global environment.** Why? Because that is how far the arrangement goes in permitting GHG emissions. In this sense, we should develop a new mechanism to make these deals a "Triple Win" approach, or to share the pain as it were, imposing some burden on both developing and developed countries. Developing countries are currently unable to purchase CDM credits, or you could say that they need not purchase them. However, under the new mechanism, it is likely that some developing countries will purchase credits to contribute to GHG emissions reduction in future. I think that **what the post-2012 framework will need is a system for both developed and developing countries to contribute to the sustainable global environment,** seeking to make their contributions through purchases of credits.

IGES White Paper
Executive Summary

IGES White Paper Executive Summary

Climate Change Policies in the Asia-Pacific: Re-uniting Climate Change and Sustainable Development

Presenter

Hideyuki Mori
Vice President, IGES

In the White paper presented at this symposium, IGES attempts a multifaceted review of the impact of climate change in Asia and the Pacific and policy approaches, based on the results of its strategic research so far.

The question running consistently through the report is how to deal with global warming while also solving compelling problems such as poverty, water, education and medical care.

This paper gives policy recommendations based on the needs of Asian countries, that integrate climate policies and sustainable development and aim to show a path to new developments on the way to a low carbon economy.

Profile

Mr. Hideyuki Mori is a graduate of the School of Engineering, Kyoto University. He joined IGES in 2003. Prior to joining IGES, he served as Environment Specialist at the Asian Development Bank, Senior Environmental Coordinator of the United Nations High Commissioner of Refugees, Director of the Office of Research and Information at the Global Environment Issues Division of the Environment Agency of Japan (present Ministry of the Environment) and as Portfolio Manager of the Division of GEF at the United Nations Environment Programme. He has served as the Vice President of IGES since 2006 and as the Director of IGES since 2007.

- IGES published second White Paper entitled “Climate Change Policies in the Asia-Pacific: Re-uniting Climate Change and Sustainable Development”. At the symposium, a summary of the White Paper was presented by Mr. Mori Vice President of IGES.

IGES White Paper Executive Summary

Climate Change Policies in the Asia-Pacific:

Re-uniting Climate Change and Sustainable Development

Climate change is real and Asia is already experiencing its adverse impacts. Projections from the Intergovernmental Panel on Climate Change (IPCC) suggest that such impacts will become even more intense in the future. While the contribution of developing countries in Asia to global greenhouse gas (GHG) emissions is increasing rapidly, per capita emissions are still low and developmental challenges remain significant. Future efforts by developed countries to reduce GHG emissions through cost-effective mitigation actions, however, offer the possibility of creating new opportunities in developing countries in Asia that will contribute to their sustainable development. Strategies to integrate climate and development actions, therefore, require prompt and careful consideration from policymakers in Asia. Part I of the White Paper explains why it is necessary to integrate climate change and sustainable development in Asia and how this might be best achieved.

Global estimates from the IPCC and Stern Review, and limited evidence from Asia, suggest that the costs of inaction on climate change would be many times the costs of action. Therefore, a multi-pronged approach to drastically slow down the rate of growth of GHG emissions in Asia, stabilise and eventually reduce them, is necessary and affordable. Likewise, adaptation efforts to manage the unavoidable impacts of climate change at all levels are crucial and must be set in motion now.

Much of the infrastructure necessary to accommodate rapid economic growth in Asia will be built in the near future. Therefore, efforts to avoid “technology lock-in” and pursue a sustainable development path are urgently needed. Sustainable development in Asia must be based on low carbon, resource efficient and qualitatively different development practices that do not deny the right to development and improvements in the quality of life. This transition will require an informed appreciation of Asia’s current status (both good and bad) and concrete recommendations for which direction the region should take in the future as outlined in the White Paper in four priority areas.

In comparison to other regions, developing countries in Asia offer the most cost-effective opportunities (e.g. energy efficiency (EE) improvement and energy diversification) for GHG mitigation and for integration of climate concerns into non-climate policies. The region also offers enormous opportunities (e.g. reversing unsustainable land use practices that lead to deforestation and degradation) for exploiting synergies between climate and other international regimes on biodiversity, desertification, and other areas.

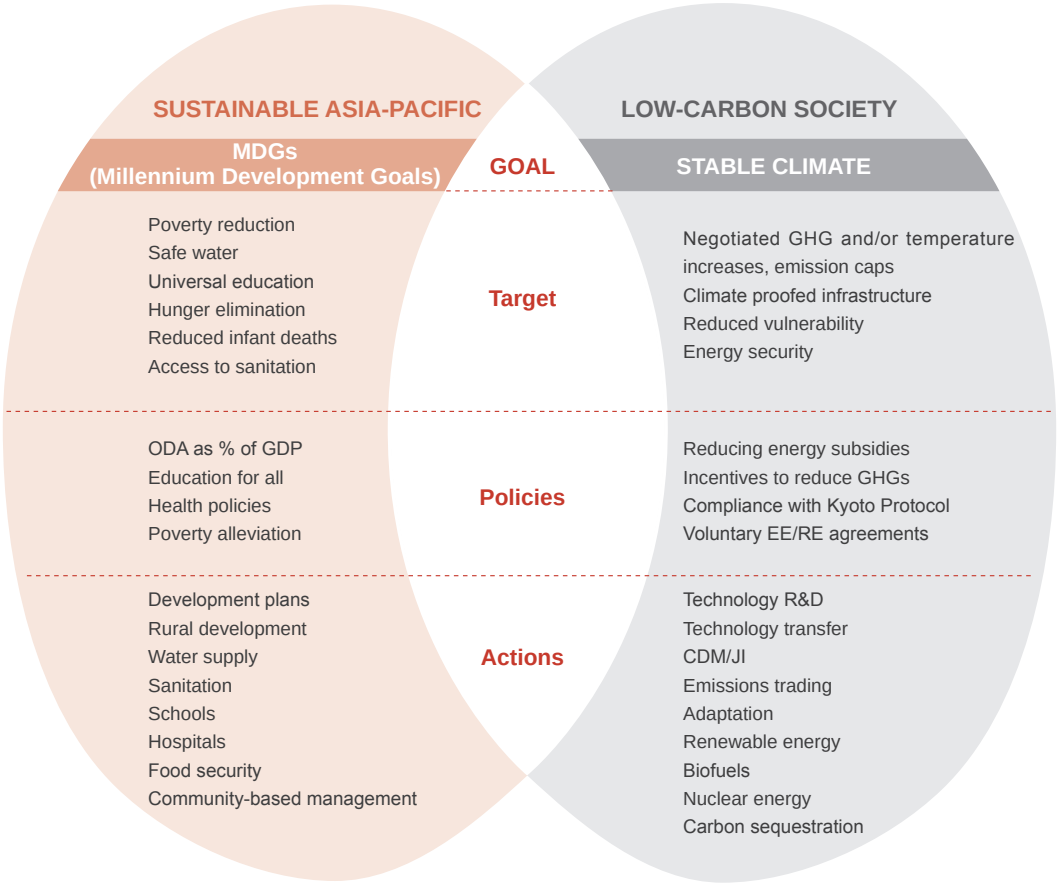
The size of the population and ecosystems vulnerable to the impacts of climate change also distinguish Asia from other regions, and failure to adapt adequately will be a major threat to meeting millennium development goals (MDG) in the region. Even though optimal paths towards adaptation are poorly understood at present, a host of “no-regrets” actions to adapt to climate change can be taken which are cost effective and make economic and environmental sense. Opportunities also exist for mainstreaming adaptation concerns in development planning and assistance.

Despite strong linkages between climate change and development, and vulnerability of Asian populations and ecosystems, climate policy has thus far received limited attention from policymakers

in several Asian countries. The lack of know-how in formulating integrated development and climate actions, and in exploiting various "win-win" options and co-benefits remain serious barriers in the region, leading to significant gaps between the formulation and implementation of effective policies affecting the climate.

Some progress has been demonstrated in developing institutional structures (e.g. inter-ministerial agencies, designated national authorities [DNA], and national committees on climate change), but most of these structures are designed to take advantage of the Kyoto Protocol's clean development mechanism (CDM) and energy investment frameworks supported by international financial institutions. No country in the region has developed a comprehensive national policy framework on adaptation.

The vision of developing a low carbon, climate-resilient Asia will require an acceleration of efforts in at least four areas: (i) promoting the involvement of developing Asia in the design and implementation of the climate regime beyond 2012; (ii) enhancing the adaptive capacity of Asian populations and ecosystems; (iii) exploiting the power of market mechanisms for the benefit of Asian societies, especially the most vulnerable groups; and (iv) transforming the social, industrial and economic infrastructure towards a low carbon economy and implementing policies to integrate climate change and sustainable development.



Post-2012 climate regime

The participation of developing countries in Asia in climate change negotiations has not been commensurate with the challenges, costs or opportunities outlined above. Proactive efforts by all countries to design and implement a new global policy framework for mitigation and adaptation that reconciles global interests on the climate with Asian priorities for development are crucial.

Since 2005, the Institute for Global Environmental Strategies (IGES) has held a series of national, sub-regional and region-wide consultations with Asian policymakers and other stakeholders on the future climate regime. The consultations found that there are shared concerns and interests in the region in (i) integrating climate concerns in development planning; (ii) streamlining the CDM by reducing its complexities and uncertainties; (iii) enhancing the focus on adaptation; (iv) facilitating the development, deployment and diffusion of low carbon technologies; and (v) strengthening the capacity of negotiators, the private sector and financial institutions. Differences between Asian countries were also evident, however, on issues such as (i) ways to consider equity in the future climate regime; (ii) the form, time and type of involvement of developing countries; (iii) national preferences for low carbon technologies; and (iv) approaches to, and funding for, facilitating adaptation, especially regarding the need for a separate protocol and the introduction of market-based mechanisms.

Further discussions and analysis of post-2012 regime proposals revealed that efforts to reflect Asian concerns on energy security and developmental needs in global climate negotiations have been far from satisfactory. Future efforts, therefore, should focus on demonstrating and facilitating the most pragmatic measures to mainstream climate concerns in energy and development planning, and on supporting implementation of integrated development and climate strategies at various levels. Since energy security is an issue in which both developing and developed countries share common interests, the future climate regime should facilitate further development of climate-friendly energy policies in Asia by sharing good practices, setting standards and guidelines, building adequate human and institutional capacities, and initiating new partnerships for regional collaboration.

A few post-2012 regime proposals have involved participation from Asian researchers and policymakers; several fail to reflect Asian needs, concerns and aspirations, and none examine the implications for future development of different Asian countries. For example, studies on the implications of a global GHG emission reduction target of 50-70% by 2050 on development prospects of Asian countries are inadequate and urgently needed. Indeed, none of the reviewed proposals simultaneously meet distributional equity, cost-effectiveness, environmental outcomes, and flexibility criteria, thereby demonstrating the complexity of developing a comprehensive, equitable and effective framework. As most countries in the region favour a comprehensive multilateral framework instead of a fragmented regime based on regional or thematic coalitions, efforts to realise the former must be accelerated.

3 OF KEY FACTORS ON THE FUTURE REGIME

1. **Enhancing the adaptive capacity**
2. **Exploiting market mechanisms**
3. **Promotion of co-benefits**

Our preference is for a framework that relies on the established United Nations Framework Convention on Climate Change (UNFCCC) concepts of common but differentiated responsibility for GHG mitigation, the polluter pays

principle and precautionary approaches for adaptation. A multi-stage framework characterised by (i) progressively increasing emission reduction and adaptation commitments or actions; (ii) new grouping of countries based on responsibility, vulnerability, capability and mitigation potential; and (iii) a differentiated framework of incentives and compliance provisions should be the basis for discussions on the future climate regime. One condition is that the grouping of countries should be reassessed at the beginning of each commitment period. Furthermore, in all countries, efforts to reduce inter- and intra-regional, high- and low-income group disparities in emissions should be promoted, recognised and rewarded. Developing countries in Asia must not shirk from their mitigation and adaptation responsibilities, but the form of participation of each developing country can and should vary significantly from the current regime's emphasis on "targets and timetables."

Since technology is a cornerstone of several non-UNFCCC initiatives, which have the potential to provide the necessary paradigm shift to reduce GHG emissions in selected industries, building synergies between UNFCCC and non-UNFCCC initiatives is crucial. In the short term, the climate regime can provide CDM opportunities in methane recovery and additional income for project developers, while the methane to markets (M2M) initiative and/or the Asia-Pacific Partnership on Clean Development and Climate (APP) can provide access to necessary technologies. Likewise, technologies for carbon capture and storage (CCS) may be transferred through the APP, if the future climate regime makes CCS projects eligible for the CDM. The future regime should also facilitate synergies among North-South and South-South technology cooperation and transfer initiatives, especially in relation to adaptation.

Since widespread deployment of low carbon technologies is crucial to realising the vision of a low carbon economy in Asia, innovative options should be considered such as (i) collaboration with developing countries in Asia in the early stages of technology development leading to joint ownership of intellectual property rights (IPR); (ii) creation of a regional technology acquisition fund, which could be structured to buy-out IPRs and make privately owned technologies available for deployment in Asia's developing countries; and (iii) establishment of a regional/international code of compulsory licensing for low carbon technologies along the lines of approaches taken for treatment of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) or the US Clean Air Act. Ensuring additional finance through innovative public and private support mechanisms is critical to make the currently available technologies commercially viable and to provide seed funding to help achieve economies of scale for emerging new technologies.

Adaptation to climate change

Adaptation should receive as much attention as mitigation because several countries in the region are already facing the impacts of climate change. Designing a new protocol on adaptation may enhance its profile at the international level, but the process may require considerable resources and time in terms of negotiation. A combination of both "top-down" support and "bottom-up" engagement approaches is crucial to advance the adaptation agenda in the region. For this to happen, the identification of options for mainstreaming adaptation concerns in development planning and assistance in Asia both at policy and operational levels is important. The agenda for adaptation financing at the international level needs to be clarified. Options for (i) enlarging the funding base and developing flexible but clear guidance to access adaptation funds; (ii) differentiating between actions that can be funded inside and outside the climate regime; and (iii) creating market mechanisms and incentives for the private sector to become more involved in adaptation must be explored.

Enhancing adaptive capacity of Asian populations and ecosystems will require multiple actions at various levels. Regional cooperation mechanisms on adaptation must be addressed on a high priority basis, especially in dealing with trans-boundary issues such as integrated river basin management, forest fire management and early warning systems. All policy areas, including those of development assistance agencies, must undergo "adaptation screens" to ensure that those policies do not exacerbate current and/or future vulnerabilities. Obstacles and tipping points for "climate-proofing" of infrastructure development and mainstreaming adaptation concerns in development planning must be assessed. A regional platform to support adaptation efforts through the creation of an Asian clearinghouse for databases and a compendium of good adaptation practices is considered vital.

Development of national policy frameworks for adaptation is urgent but there is significant scope to build on existing institutional frameworks. Asian developing countries are a good reservoir of indigenous knowledge and local coping strategies to deal with climate variability. Opportunities for integrating such knowledge in local adaptation plans and for widespread application of such strategies in new areas must be explored. An assessment of the current financial instruments available to support adaptation in Asia suggests that the amount of resources flowing through such instruments is inadequate. Therefore, options for (i) enlarging the funding base for adaptation both within and outside the UNFCCC; (ii) involving the private sector (e.g. insurance sector) in facilitating adaptation at regional, national and local levels; and (iii) establishing a region-wide adaptation financing and insurance facility should be examined.

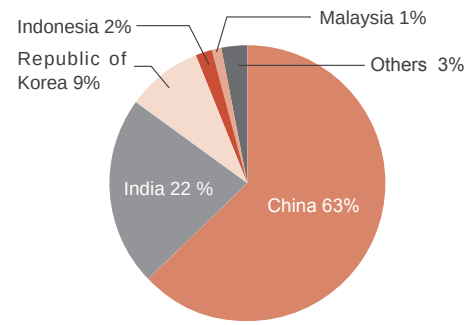
Market mechanisms

Although many Asian developing countries have expressed a keen interest in drawing benefits from the CDM and despite the initial expectation that the CDM could be made into an effective tool to promote sustainable development, concerns about the CDM implementation in Asia remain salient. Concerns include complex modalities for project approval, lack of a development dividend in projects delivering high certified emissions reduction (CER), uncertainty over post-2012 carbon credits, and uneven geographic distribution of projects within Asia. Developing countries in Asia, in close collaboration with the UNFCCC Annex I parties, should strive to remove each of these barriers so that the power of market mechanisms can be fully exploited, particularly for the most vulnerable segments of Asian society.

In the short term, strengthening of human and institutional capacities and improving the operational setting for CDM implementation in Asian countries is an urgent priority. Based on IGES' experience with integrated capacity strengthening for CDM in Asian developing countries, substantial scope exists for streamlining the CDM approval process in both host countries and the CDM Executive Board. As many CDM projects in Asia are unable to get off the ground due to insufficient underlying financing, innovative options should be explored such as the use of official development assistance and other multi-source funding approaches to cover projects risks, especially in least developed countries (LDC) and middle-income countries. The Asian Development Bank should consider using its CDM facility to support post-2012 CERs, similar to the World Bank's "carbon market continuity fund."

In the medium term, the scope of CDM should be expanded to include sector-based and policy-based approaches based on the experience gained from approval of the "Programme of Activities" in different Asian countries. On a priority basis, binding trans-national sectoral emission limits for some key sectors represented by multinational companies such as steel, cement and aluminium must be explored. Likewise, CDM should be expanded to cover sectors that can deliver significant reductions in GHG emissions in Asian countries, such as forestry. In the medium to long term, options for promoting the developmental dividend of CDM projects in Asia through quantifying and preferentially rewarding projects with high developmental benefits must be explored both within and outside the UNFCCC. Japan and other G8 countries should play a lead role in supporting Asian projects with high developmental dividends by streamlining guidelines for development assistance.

Distribution of CER volumes from CDM projects in Asia by country (as of March 2008)



Source: IGES CDM project database (http://www.iges.or.jp/en/cdm/report.html)

Sustainable development co-benefits

The widely-held assumption in Asia that GHG mitigation is inherently incompatible with sustainable development must be corrected. Despite numerous integrated climate and development policies in Asia (as identified from World Resources Institute's database on sustainable development policies and measures [SD-PAMs]), awareness of these policies remains limited in the region. Therefore, institutional frameworks and incentives to promote the awareness and implementation of such policies and to mainstream the concept of co-benefits of mitigation and adaptation in national planning need to be revisited in the short term.

In the medium to long term, opportunities for promoting co-benefits through building on synergies among multilateral conventions should be examined. The future climate regime discussions must examine options for funding SD-PAMs in return for emission reductions as compared with the

Step-wise implementation of SD-PAMs in an international climate framework
1. Country outlines on future development objectives
2. Identification of PAMs to achieve development objectives more sustainably
3. Mobilise investment and implement SD-PAMs
4. Recording SD-PAMs in a registry (e.g. maintained by the secretariat)
5. Setting up a national monitoring system to track the implementation of SD-PAMs
6. Review of SD-PAMs in SD units, either as part of a NC or a specific review
7. Quantifying the changes in GHG emissions from individual PAMs
8. Identifying PAMs with synergies or conflicts between sustainable development benefits and GHG limitations
9. Summarizing the net impact of a basket of SD-PAMs on development and GHG emissions

business-as-usual scenarios. Suitable metrics of performance that enable the monitoring of co-benefits should be developed. Operational support from the climate framework, for example, through the maintenance of a registry of SD-PAMs and identifying synergies between sustainable development benefits and GHG mitigation and adaptation, would be helpful.

Communities in several Asian countries have acquired a significant amount of experience with innovative low carbon lifestyle patterns including material reuse and recycling. However, recent trends and future projections in Asia suggest development patterns with an ever-increasing carbon footprint. A roadmap to achieve rapid transformation of social, industrial and economic structures in each developing Asian country must be built on the basis of national circumstances, without sacrificing the right for development. Blueprints for switching to an emission stabilisation pathway do not yet exist even in developed countries; hence developing countries in Asia must not wait to learn lessons from developed countries. Future investments in the region, especially in industrial development, urban planning and transportation sectors, must aim to reduce energy use and GHG intensity. Likewise, policies for transformation of the energy sector (e.g. power distribution networks) to more renewable energy (RE) sources and to small-scale, decentralised power generation in homes and businesses will be crucial. Improvement of communication channels to accelerate informed debate on options for achieving a low carbon society is also vital for the region.

Climate policy alone will not solve the climate problem, as climate outcomes are influenced not only by climate-specific policies but also by the mix of development choices made and the development paths along which these policies lead (IPCC 2007). Asian policymakers, therefore, have a significant role to play in choosing appropriate development paths. In so doing, they should ensure that the region's climate policies are resilient, remaining flexible in the face of an inherently uncertain issue, while holding firm in the face of opposition from carbon-intensive industries and other vested interests. Striking this balance will depend upon the adaptability of key sectors (discussed in Part II) to climate friendly development and the alignment of climate concerns with sustainable development policies in the region.

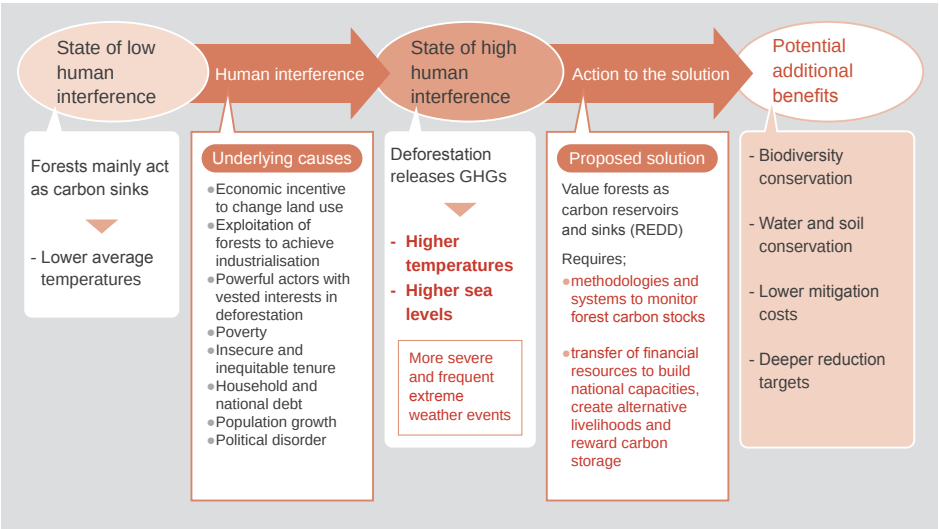
In Part II of the White Paper, selected sectors are investigated to illustrate some of the complexities in aligning climate concerns and sustainable development policies in Asia-Pacific. The capabilities of key actors (government, civil society and the private sector) and how they have changed in order to respond to the challenges of climate change completes the analysis.

Reduced emissions from deforestation and forest degradation in developing countries

With deforestation as the second largest anthropogenic source of GHG emissions and a major contributor to unsustainable development, any scheme that will reduce the current rates of deforestation and forest degradation should be supported. Moreover, some policy responses to climate change, like biofuels, are inadvertently promoting deforestation in Asia. Therefore, the optimum policy choices in containing deforestation and forest degradation require careful analysis. The forest sector is an ideal vehicle for demonstrating the need to conjoin climate change and sustainable development policies, because millions of forest-dependent people are potentially affected by decisions by governments in developing countries that could constrain access to Asia's forests in return for payment by developed countries to sequester carbon dioxide.

The concept of providing a new incentive for forest conservation through international financial transfers connected with carbon, or reduced emissions from deforestation and forest degradation

REDD Logic



in developing countries (REDD), is now high on the international climate agenda. REDD is a low-cost option for reducing global GHG emissions; there are numerous side-benefits (like biodiversity conservation), and it has increasing support in the climate change negotiations. For REDD funding to be consonant with sustainable development objectives it must promote accountable and transparent forest governance, secure and equitable forest tenure, and sustainable livelihoods. The dilemma is that the developing countries that would benefit most from this proposed funding mechanism are those with historically weak forest governance and a poor record in defending the rights of forest-dependent communities.

For a credible REDD scheme to be agreed upon, negotiators need to resolve fundamental questions on trade of avoided deforestation emissions, use of a national or project approach, the scope of coverage, and mechanisms for community participation. Independent standards need to be formulated to protect the environment and ensure that forest-dependent people are not disadvantaged. Nevertheless, a well-designed REDD mechanism would not only contribute to reduced GHG emissions, it would also provide opportunities to reform forest governance and alleviate rural poverty, while promoting sustainable development in Asia's developing countries. The current piloting of different models will help to clarify many of these issues, before adopting a comprehensive scheme in accordance with the Bali Action Plan.

Biofuels

Biofuels, a renewable form of energy produced from plants or waste, have attracted significant attention in Asia because of their potential to reduce GHG emissions, promote national energy security, and revitalise rural economies. However, the reality is more complex, and more nuanced policies are needed. In particular, the rush to promote biofuels could be counterproductive if they are not produced by sustainable means. Research based on a life cycle assessment approach shows that first generation biofuels (i.e. from food crops, oil palm, sugarcane and other crops) could produce more energy than they consume in the production process and reduce GHG emissions,

but this depends on the production process including energy and fertiliser inputs, and the nature of any land use changes. Inappropriate production methods or land use changes (e.g. destroying forests to plant biofuel crops) could result in increased GHG emissions. Worse, by competing with food production, biofuels may increase the price of basic food items, making them unaffordable to the poor, and trigger new agricultural lands to be opened up through deforestation. Use of oil-bearing plants, like jatropha, to avoid the food-fuel conflict by utilising supposed "wastelands" may deprive landless poor farmers of common grazing land and offer no reversion to food consumption during times of drought or other food shortages. It is also questionable whether its production could be limited to wastelands.

Subsidising unsustainably produced biofuels or mandating their blending into existing transportation fuels could be counterproductive, especially on a large scale. Global trade in biofuels may help developed countries in Europe to meet their Kyoto Protocol commitments but unintentionally accelerate deforestation in tropical Asian forests.

Second generation biofuels have significantly more potential for reducing GHG emissions and avoiding the food-fuel conflict. They can be produced from a wider range of sources including agricultural, forest, and some municipal and other waste, and microalgae. The potential to convert waste to liquid fuel is particularly attractive. Unfortunately, the chemical conversion processes are more complicated, probably more costly, and not yet commercially viable. Even if the technology becomes commercially viable, the policy challenge will be to organise a collection system and address the issue of transport costs. Nevertheless, additional research and development should be devoted to this avenue rather than blindly continuing to follow the short term, easier path of converting existing crops into bioethanol and biodiesel.

In the near term, the policy priority should be to promote sustainable production methods for biofuel feedstocks, especially avoiding direct or indirect deforestation. This should start with sustainability standards and certification. Asian countries should conduct their own biofuel related research since their conditions are different. Trade related policies should not be prioritised until sustainability issues have been resolved. Biofuels are not a silver bullet, and they need to be placed in the context of comprehensive energy policies, which include conservation and other renewable energy forms.

Urban organic waste and climate change

Safely disposing of urban organic waste has been a problem for as long as the history of human settlement. Organic waste is not just a health hazard and public nuisance but also contains valuable nutrients and energy, so merely removing it to a municipal dumpsite on the outskirts of the city is not a sustainable solution. The typical response of transforming uncontrolled dumpsites into more sanitary forms of landfill may control the health hazards, but then decomposition of waste under anaerobic conditions generates methane, a potent GHG. Methane from solid waste disposal sites contributes 3-4% of anthropogenic GHG emissions, and is growing. Under status quo urban waste management scenarios, methane emissions are projected to increase by 2.6-9.6 times in Asia's developing countries, due to increasing urban populations and rising per capita consumption.

Compared to open dumps and landfills, biological treatment methods (composting and anaerobic digestion) are shown to have considerable advantages. They can drastically reduce emissions of GHGs, recycle nutrients and be introduced at small scale and at low cost, thus contributing to sustainable development. Composting is identified as an especially interesting option since it is

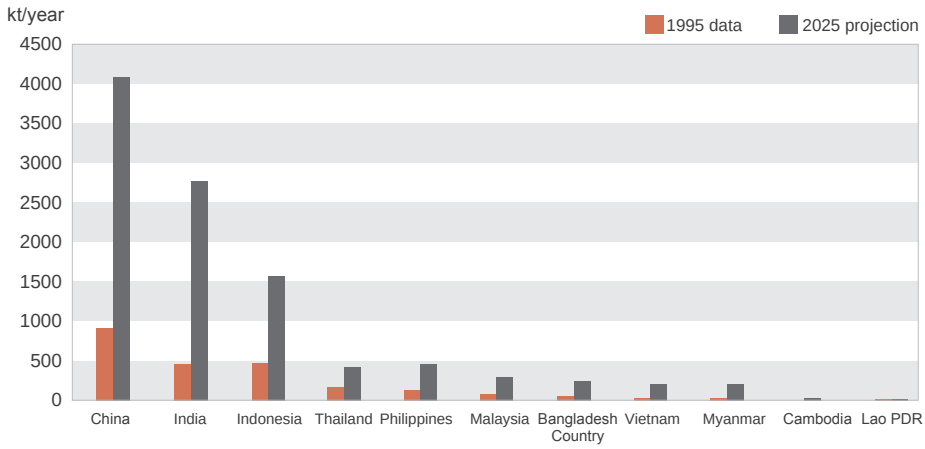
highly adaptable and suitable for community-driven initiatives. By examining policies and practices related to organic waste management in several Asian countries and six municipal case studies, a number of policy measures to promote more widespread use of composting are suggested.

The results show that centralised composting of fresh market waste, without any intention to generate income from selling the product, can only treat a limited share of a city's waste, but seems to be an easy and suitable model to start with. Composting of household waste is more difficult, because it requires changes in individual behaviour, although there are some successful examples that have typically started small and gradually expanded. Careful segregation at source is crucial for projects that need to create revenues by selling their product to farmers as soil conditioner or fertiliser. Municipal solid waste management is a good example of an issue where an integrated approach can generate significant co-benefits. Therefore, policymakers should promote more widespread use of composting, both as a way to solve some local development challenges and environmental problems and as a contribution to combating climate change.

Groundwater

Billions of people in the Asia-Pacific depend on groundwater for irrigation, drinking water and industry, but it has been poorly managed, partly because it is out of sight. Climate change impacts on groundwater now pose a completely new management challenge. Climate change will make some parts of Asia wetter, others drought affected; glaciers will melt, and seasonal flows will change; and

Waste generation rates and methane emissions from solid waste disposal sites (1995-2025)



everywhere climate variability and extreme events will become more problematic. Sea level rise, especially in deltaic regions and coral atolls, will increase saline intrusion into groundwater, making it unsuitable for use. Other changes like subsidence, soil temperatures and chemistry, impacts on transmissivity, land use changes and effects on evapotranspiration may have impacts on groundwater in ways that are not yet defined or adequately modelled. Groundwater may increase in importance and help to ameliorate the worst effects of climate change on water resources and sustainable development. However, once seriously damaged, recovering groundwater resources requires vast amounts of funds and time.

Policy responses to these changes should provide examples of how climate change adaptation and sustainable development need to be linked, although so far most countries in Asia have not realised or responded to the multiple effects of climate change on their water management plans. Policies and adaptation measures are needed in relation to structural adaptation (e.g. rainwater harvesting, artificial recharge of aquifers, desalination plants, underground reservoirs, and dams) and institutional changes (e.g. legislation, tenure rights, improved governance, groundwater pricing, zoning, and access to adaptation funds). However, to fill the knowledge gaps and reduce uncertainty regarding the prediction of impacts of climate change on groundwater resources and evaluation of future groundwater management options, more research is needed.

Institutions

All countries in the Asia-Pacific have new institutional arrangements to respond to the global challenges of climate change. The White Paper examines how national governments are structuring their agencies to respond to climate change, and how countries are mobilising the participation of other stakeholders, including local governments, the private sector, civil society and academia to play a role in climate related activities. Five Asian countries were selected for comparative study: China, India, Japan, the Philippines, and the Republic of Korea (ROK).

Examples of potential impacts of climate change on groundwater resources

■ Direct impacts

- Variation in duration, amount and intensity of precipitation and evapotranspiration will increase or decrease recharge rates.
- Rising sea levels will allow saltwater to penetrate farther inland and upstream in low lying river deltas.
- Variation in CO_2 concentrations may affect carbonate dissolution and the formation of karst.

■ Indirect impacts

- Land cover changes (viz. natural vegetation and crops) may increase or decrease recharge.
- Increase in groundwater extraction due to decrease in reliability of surface water as a result of increased floods and droughts.
- Increase in flood frequencies may affect groundwater quality of alluvial aquifers.
- Variation in soil organic carbon content may affect the infiltration properties above aquifers.

Most countries in Asia have developed some form of inter-agency coordination to ensure integrated domestic climate policies. Common success factors found in building domestic institutional capacity include (i) strong overall coordination by an executive leadership body; (ii) industry and environment agencies as joint lead agencies; (iii) extensive involvement of other agencies covering sectors related to mitigation and adaptation; and (iv) well established mechanisms to empower stakeholder participation. Nevertheless, there is no “ideal” institutional arrangement that will work equally well for all countries.

The attention to domestic mitigation and adaptation arrangements, as part of ongoing national sustainable development efforts, needs to be enhanced. The enigma of why climate change has been treated in some countries as a stand-alone development issue rather than being integrated into existing national sustainable development structures, measures and implementation plans requires further research. The final goal of effective institutions is to achieve grass-roots behavioural

International and domestic levels of global climate regime

International arena

International treaties established through international negotiations

- UNFCCC
- KP
- Others

Implementation

Domestic arena

Translation of international commitments under the UNFCCC and its KP into domestic actions

- Preparation of national communications
- Domestic implementation of binding reduction targets for greenhouse gas emissions by Annex I countries under the KP
- Promotion of clean development mechanism (CDM) projects in developing countries
- Others

change. Unless the relationship between specific institutional arrangements and associated behavioural changes at individual and group levels are understood, the effectiveness of institutions cannot be assessed.

Industry

Globally, industry is increasingly aware of its responsibility for climate change and, despite much uncertainty surrounding the issue, private sector investment decisions that will have implications for the next 30-50 years are tentatively factoring in CER pricing and the possibility of carbon taxes. Eventually, Asian industries will have to make a transition to non-fossil fuels, as current projections indicate that Asia will contribute almost one third of global GHG emissions by 2030. In the short term, however, major contributions can be made by minimising energy demand through adoption of a wide range of EE options. A vigorous EE strategy will enable greater emission reductions than any other climate change alternative with short payback periods and will add to bottom line profits as energy prices continue to increase. Many companies have made a profit while saving 20–40% of energy use, with payback periods of only one to three years.

The apparent barriers limiting greater government intervention in EE include a lack of sectoral targets, standards and incentives, and perverse subsidies. Barriers limiting private sector adoption of EE include risk aversion, minimal capacity of small industries, access to energy efficient technologies, finance, and human resources. Some actions have been taken in Asia (e.g. energy conservation policies, tax incentives and subsidies, voluntary certification and agreements, supply chain cooperation, energy service companies, and research and development support) to overcome these barriers and many lessons can be drawn from Japan's experience. The key element in effective EE strategies is implementation of combined actions in a parallel, coordinated and consultative manner. The future research agenda should focus on collecting detailed case study information from all sectors and all sizes of companies on successful implementation of EE measures.

Conclusion

The historic development pathway of Europe and the US is clearly not sustainable in developing Asia, with its larger population, constrained by resource limitations, and now facing the global challenges of climate change. So far, however, Asia has not framed an alternative future that simultaneously provides for an escape from poverty, improves standards of living, and responds to the need for a low carbon, climate resilient sustainable development pathway. Asian countries need to become more involved in the global climate change negotiations, if only to ensure that sustainable development and climate change remain as a single pathway to development, not diverging tracks.

Four priorities were identified in the White Paper: (i) building a fair, effective, and flexible post-2012 climate regime; (ii) enhancing the region's adaptive capacity; (iii) utilising market mechanisms more effectively; and (iv) building a low carbon society and exploiting developmental co-benefits, of which the task of transforming Asia's social, industrial and economic infrastructure towards a low carbon society is the most daunting. Nevertheless, the climate change regime beyond 2012 can be designed to assist Asia in this transformation—encompassing market mechanisms that transfer financial resources into the world's most cost-effective climate change mitigation options and ensuring that future infrastructure investments are designed and implemented to enhance the adaptive capacity of Asia's population and ecosystems.

Cost-effective mitigation options that are intimately linked with sustainable development were detailed in the REDD proposals, and are potentially available in second generation biofuels using Asia's abundant organic waste, and in composting municipal solid waste. Protecting the region's groundwater resources, as a reserve or insurance for future climate variability that will impact on surface water resources already stretched to the limit, is just one example of the inevitable adaptation measures that must be integrated with sustainable development planning and implementation.

These far reaching mitigation and adaptation measures, however, will not happen unless Asia's multiple stakeholders—governments, the private sector, and civil society—stand together with a shared vision of a low carbon, climate resilient future for Asia and the Pacific.

As a strategic environmental policy research institute, IGES is committed to continue bringing together all of these stakeholder groups and forging a common vision for the future, conducting research that contributes to real-time policy processes, and disseminating informed views on policy options for stronger reconciliation of climate change responses and sustainable development. On the occasion of its 10th anniversary, IGES hopes that this White Paper will be a significant contribution to this agenda.

Appendix : Programme

IGES 10th Anniversary Symposium

Strategy to Combat Climate Change in Asia and the Pacific

Date: 21 June 2008
Venue: Pacifico Yokohama, International Conference Center, Japan
Languages: English and Japanese (with simultaneous interpretation)
Organiser: Institute for Global Environmental Strategies (IGES)
Supporters: Ministry of the Environment, Japan
Kanagawa Prefectural Government, Japan
Participants: 330

Programme

Part One: Special Session 10:00 – 12:15

10:00 – 10:05 **Opening Remarks** Prof. Hironori Hamanaka, Chair of the Board of Directors, IGES

10:05 – 11:05 **Panel 1: Climate Change and Natural Resources Management**

<Moderator >	Dr. Peter King,	Senior Policy Advisor, IGES
<Panelists>	Prof. Shinichiro Ohgaki,	Professor, The University of Tokyo
	Prof. Masahiro Amano,	Professor, Waseda University
	Dr. Mark Elder,	Manager, Programme Management Office, IGES
	Dr. Henry Scheyvens,	Manager, Forest Conservation Project, IGES

11:05 – 11:15 Break

11:15 – 12:15 **Panel 2: Approaches to Low Carbon Society for Asia and the Pacific**

<Moderator >	Mr. Taka Hiraishi,	Co-Chair, Intergovernmental Panel on Climate Change(IPCC) Inventories Task Force Bureau; Member of the Board of Directors, IGES
<Panelists>	Dr. Hoi-seong Jeong,	President, Korean Society of Environment Policy and Administration
	Dr. Shuzo Nishioka,	Senior Research Advisor, IGES
	Mr. Masakazu Ichimura,	Chief, Environment Section, Environment and Sustainable Development Division, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
	Dr. Ancha Srinivasan,	Principal Researcher and Manager, Climate Policy Project, IGES
	Mr. Yuji Mizuno,	Senior Expert and Manager, Market Mechanism Project, Climate Change Area, IGES

12:15 – 13:30 Lunch Break



Part Two: Symposium 13:30 – 17:00

13:30 – 13:45 **Opening Remarks** Prof. Hironori Hamanaka, Chair of the Board of Directors, IGES

13:45 – 13:55 **Guest Speech 1** Mr. Ikuzo Sakurai, Senior Vice-Minister of the Environment, Japan

13:55 – 14:05 **Guest Speech 2** Mr. Shigefumi Matsuzawa, Governor of Kanagawa Prefecture, Japan

14:05 – 15:15 **Keynote Session**

- Keynote Speech 1
  Ms. Yoriko Kawaguchi, Member of the House of Councilors; Former Minister for Foreign Affairs; Former Minister of the Environment, Japan
- Keynote Speech 2
  Dr. Rajendra Pachauri, Chairman, Intergovernmental Panel on Climate Change(IPCC)

<Moderator> Prof. Ryokichi Hirono, Professor Emeritus, Seikei University

15:15 – 15:30 **Presentation: Proposals from IGES** Mr. Hideyuki Mori, Vice President, IGES

15:30 – 15:45 Coffee Break

15:45 – 16:55 **Panel Discussion: Climate Challenge for Asia and the Pacific**

<Moderator > Prof. Hironori Hamanaka, Chair of the Board of Directors, IGES

<Panelists> Prof. Akio Morishima, Special Research Advisor, IGES

Prof. Nay Htun, State University of New York, Stony Brook

Dr. Hans-Jochen Luhmann, Project Leader for General Affairs, Wuppertal Institute for Climate, Environment and Energy, attached to Research Group 1

Mr. Shigeru Mochida, Deputy Executive Secretary, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

16:55 – 17:00 **Closing Remarks** Mr. Hiroyuki Ishitobi, Secretary General, IGES

IGES 10th Anniversary Symposium Report

Strategy to Combat Climate Change in Asia and the Pacific

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