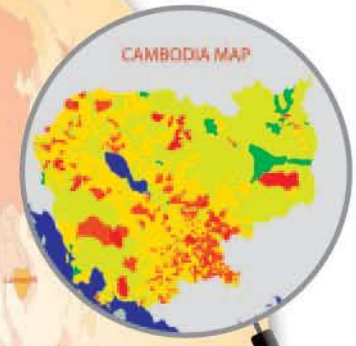
ROYAL GOVERNMENT OF CAMBODIA
NATIONAL CLIMATE CHANGE COMMITTEE

# THE FIRST NATIONAL FORUM ON CLIMATE CHANGE

# PROCEEDINGS




19-21 October 2009
Phnom Penh, Cambodia

SUPPORTED BY:

UNDP Cambodia

Danida

Sida

Oxfam America

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# FOREWORD

The First National Forum on Climate Change was held in Phnom Penh, Cambodia, on 19-21 October 2009. The forum brought together national and international stakeholders and experts from various ministries and agencies, development partners, the private sector, academia and NGOs to share knowledge, expertise and practical experience. The National Climate Change Committee (NCCC) organized the forum with support from the Ministry of Environment's Climate Change Department (CCD) and selected development partners including UNDP, Danida, Sida and Oxfam America.

The main purpose of the forum was to raise awareness and understanding of climate change issues among government ministries and agencies, and NGOs and civil society organisations; to enhance coordination, synergies and partnerships between development partners, the Government, NGOs, academia and the private sector; to improve policy dialogue on climate change; and to strengthen the National Climate Change Committee's ability to implement its mandate as the leading government body on climate change policy and coordination.

The forum also provided an opportunity for the Government to further develop its negotiating position for the forthcoming 15th Conference of Parties (CoP-15) to the United Nations Framework Convention on Climate Change (UNFCCC) to be held in Copenhagen in December 2009. The forum was attended by more than 700 guests on the first day and more than 300 participants on the second and third days, including government officials, representatives of diplomatic missions, development partners, NGOs and the private sector, and Buddhist monks and students.

The forum was presided over by Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia, in the inaugural session. The Senior Minister and Minister of Environment, H.E. Dr Mok Mareth, and the Minister of Water Resources and Meteorology, H.E. Mr Lim Kean Hor, made opening speeches on the second and third days respectively. Development partner representatives, including the UN Resident Coordinator, the European Union Chargé d'Affaires, the UNDP Country Director and the World Bank Country Manager shared welcoming remarks, highlighting their support and commitment to assisting Cambodia in addressing climate change risks.

The forum heard presentations from national and international experts from national ministries and agencies, development partners, international organizations, NGOs and the private sector. It proved to be an important opportunity for learning and dialogue between the Government, development partners, the private sector and civil society to forge collective efforts for addressing climate change risks.

This document provides a summary of the proceedings, main discussions and key conclusions of the forum. We hope that the discussions started during this First National Forum on Climate Change will continue, in order to inform policy debate, decision-making and related actions in the move to a more climate resilient and low carbon economy and to make use of the emerging opportunities for poverty reduction through climate change risk management.

**H.E. Dr. Mok Mareth,** Senior Minister and Minister of Environment, Chair of the National Climate Change Committee

# ACRONYMS

| | |
|---|---|
| **AfD** | Agence France de Developpement |
| **APF** | Action Plan Framework |
| **CDM** | Clean Development Mechanism |
| **CFO** | Community Forestry Organisation |
| **CIB** | Cambodia Investment Board |
| **CMDG** | Cambodia Millennium Development Goal |
| **CRDB** | Cambodia Rehabilitation and Development Board |
| **CDC** | Council for the Development of Cambodia |
| **Danida** | Danish International Development Agency |
| **DFID** | Department for International Developent (UK) |
| **DNA** | Designated National Authority |
| **EU** | European Union |
| **GCMs** | General Circulation Models |
| **GERES** | Groupe Energies Renouvelables, Environnement et Solidarités |
| **GHG** | Greenhouse Gas |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **JICA** | Japan International Cooperation Agency |
| **KOICA** | Korean International Cooperation Agency |
| **LDC** | Least Developed Country |
| **MARD** | Ministry of Agriculture and Rural Development, Vietnam |
| **MDG** | Millennium Development Goal |
| **MEF** | Ministry of Economy and Finance |
| **MIME** | Ministry of Industry, Mines and Energy |
| **MoE** | Ministry of Environment |

| | |
|---|---|
| **MoEYS** | Ministry of Education, Youth and Sports |
| **MoP** | Ministry of Planning |
| **MoWRAM** | Ministry of Water Resources and Meteorology |
| **NAMA** | Nationally Appropriate Mitigation Action |
| **NAPA** | National Adaptation Programme of Action to Climate Change |
| **NCCC** | National Climate Change Committee |
| **NEDO** | New Energy and Industrial Technology Development Organization, Japan |
| **NFDS** | National Forest Development Strategy, Vietnam |
| **NGO** | Non-governmental Organization |
| **NTP-RCC** | National Target Program to Respond to Climate Change, Vietnam |
| **OA** | Oxfam America |
| **ODA** | Official Development Assistance |
| **PIN** | Project Idea Note |
| **RE** | Renewable Energy |
| **REDD** | Reducing Emissions from Deforestation and Forest Degradation |
| **REE** | Rural Electricity Enterprise |
| **RGC** | Royal Government of Cambodia |
| **Sida** | Swedish International Development Agency |
| **TWG** | Technical Working Group |
| **UN** | United Nations |
| **UNDP** | United Nations Development Programme |
| **UNDAF** | United Nations Development Assistance Framework |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **UNESCAP** | United Nations Economic and Social Commission for Asia and the Pacific |
| **US$** | US dollar |
| **WB** | World Bank |
| **WHG** | Waste Heat Generation |

# ACKNOWLEDGEMENTS

As the NCCC Chair, I would like to thank all members of the NCCC for their efforts in organizing the forum.

I would like to express our profound gratitude to **Samdech Akka Moha Sena Padei Techo Hun Sen,** Prime Minister of the Kingdom of Cambodia, and Honorary Chair of the National Climate Change Committee, for his guidance and leadership provided in the inaugural session.

I would like to sincerely thank **H.E. Lim Kean Hor**, Minister, Ministry of Water Resources and Meteorology; **H.E. Sat Samy**, Secretary of State, Ministry of Industry, Mines and Energy; **H.E. Ou Orhat,** Secretary of State, Ministry of Planning; **H.E. Lim Sokun**, Secretary of State, Ministry of Agriculture, Forestry and Fisheries; **H.E. Chhieng Yanara,** Secretary General, Cambodian Rehabilitation and Development Board/Council for the Development of Cambodia; **H.E. Srun Dara,** Under Secretary of State, Ministry of Economy and Finance; **H.E. Duy Thouv,** Deputy Secretary General, Cambodia Investment Board and Council for the Development of Cambodia; **H.E. Hak Seng Ly,** Under Secretary of State, Ministry of Education, Youth and Sports; and **Oknha Khaou Phallaboth**, President, Khaou Chuly Group, for different roles in the forum.

Our gratitude also goes to all speakers, panelists and chairs of sessions, who are listed throughout this summary of proceedings, and who contributed to the richness of the dialogue in the forum through their extensive knowledge and practical experience.

We would also like to thank all those participants who generously shared their perspectives on the various subjects, especially the numerous officials from the Royal Government of Cambodia (RGC), as well as various development partners, NGOs, students, Buddhist monks, the media and the private sector.

The forum would not have been possible without support from Danida, Sida, Oxfam America and UNDP.

Phnom Penh

**H.E. Dr. Mok Mareth**
Senior Minister and Minister of Environment,
Chair of National Climate Change Committee

# EXECUTIVE SUMMARY

The forum would not have been possible without support from Danida, Sida, Oxfam America and UNDP. Cambodia's First National Forum on Climate Change was held on 19-21 October 2009. Its aim was to raise awareness among Government, civil society and development partners about climate change as a development issue and its potential impact on the achievement of the Millennium Development Goals. The forum also provided an opportunity to share lessons learned from applied mitigation and adaptation, and to assist the Royal Government of Cambodia in refining its position in the lead-up to the 15th Conference of Parties to the UN Framework Convention on Climate Change.

## DAY 1

The inaugural ceremony on the first half-day summarized Cambodia's ongoing efforts and the Government's commitment to addressing climate change issues. Noting that the forum represented another crossroads in the country's history, the Prime Minster affirmed Cambodia's support for the UNFCCC's principles on common but differentiated responsibilities, the different needs and unique circumstances of developing countries, the need for support from the developed world, and the right of developing countries to sustainable development. Development of a climate change policy, strategy and action plan, including mainstreaming into national and sectoral plans, was recognized as a priority, along with institutional and technical capacity development and effective sectoral coordination for implementation.

The Senior Minister and Minister of Environment, NCCC Chair, commented that climate change is not only an environmental issue but also a development issue, and that cross-sectoral and multi-disciplinary interventions are therefore needed. The new challenge from climate change could threaten socio-economic development and might have negative impacts on national development efforts if adequate responses are not made.

## DAY 2

The second day heard opening remarks by the UN Resident Coordinator, the EU's Chargé d'Affaires and the Senior Minister and Minister of Environment, NCCC Chair. The speakers reaffirmed that a failure to cope with the impact of climate change would undermine progress towards achieving the Cambodia Millennium Development Goals and overall economic and social development. In addition to the urgent need to take adaptation measures, investment in developing a low-carbon economy was highlighted as an opportunity not only to address climate change, but also to generate additional income and employment. It was noted that the new UN Development Assistance Framework (UNDAF) includes specific measures to further strengthen climate change initiatives currently supported by UN agencies.

The EU's comprehensive package of new policies and measures to tackle climate change was described as having been achieved through the European Climate Change Programme (ECCP). The EU's Emissions Trading System was promoted as a cost-effective emission reduction strategy. It was noted that the EU assists developing countries to tackle climate change by incorporating the EU Action Plan on Climate Change and Development into all aspects of its development policy funding in EU geographic programmes. The Global Climate Change Alliance (GCCA) assists selected Least Developed Countries and Small Island Developing States to take part in climate change dialogue on the post-Kyoto climate regime.

Three keynote presentations were made. The first presentation explained various projected climate scenarios and the observed changes in climate and their potential impacts. With an increase in observed temperatures of 0.74°C between 1906 and 2005 and a projected increase of 1.8°C to 5.4°C by 2100, this trend was explained as being influenced by on technology use and world development trends. While climate change will pose additional threats to our living environment, additional impacts such as overfishing, acidification, environmental pollution and invasive species will aggravate the situation.

To limit the increase in global temperatures to a maximum of 2°C, countries were called on to act now, to act together and to act differently. It was claimed that addressing climate change now will be less expensive than leaving it to be dealt with in the future. Since different countries are at different stages of development and use different technologies, emission reduction is said to be less costly in developing countries than in developed countries.

While climate change impacts have been estimated at a global level, Southeast Asia was noted as being more vulnerable to impacts due to its geographic setting and current development patterns. It has been calculated that 12 percent of global emissions emanated from Southeast Asia in 2000, of which 75 percent came from land use and the forestry sector, 15 percent from the energy sector and 8 percent from the agriculture sector. Thus, it was said that Reducing Emissions from Deforestation and Forest Degradation in Developing Countries programme (REDD) has high potential for improving forest management and carbon sequestration. Other promising changes are reducing emissions from agriculture through improvements in fertilizer use, better waste management, and reform of agricultural support policies.

Working Session 1 covered current global mitigation initiatives and Cambodia's status regarding the Clean Development Mechanism, REDD experiences in Cambodia and Vietnam, renewable energy development in Cambodia, and lessons learned from low cost technology use. Of the three Kyoto Mechanisms, the Clean Development Mechanism was noted as the one most relevant for allowing developing countries to benefit from certified emission reductions and aspects of sustainable development. Waste heat generation in Kampot Cement, biogas generation from waste water in tapioca starch production in Memot, hydropower in Kamchay, Angkor Biocogen cogeneration using rice husks, and Samrong Thom piggery were noted among Clean Development Mechanism projects being implemented in the country.

With regard to REDD, the Forestry Administration said that it has been designated as the responsible agency for REDD implementation, and research into and assessment of carbon stocks in national forests, as well as arrangements for the commercialization of forest carbon and forest services. Cambodia's current REDD projects include a project in Oddar Meanchey Province incorporating 12 Community Forestry Organizations covering more than 60,000 ha of forest, and another project under development in Keo Seima District, Mondulkiri Province.

REDD implementation was recognized as requiring substantial investment from both the Government and donors. REDD outcomes should include improved institutional capacity, particularly at the local level, active participation of local authorities and communities, and improved coordination at the national and regional level. Political support is needed to improve forest management in developing countries through REDD. Challenges for REDD implementation in Cambodia include lack of capacity and data and the need for a new level of governance, coordination among agencies and its incorporation into current programmes.

While Cambodia has high potential for rural electrification, it remains at an early stage of implementation. Solar energy has high potential as a source of renewable energy, but faces technological and market challenges. Only a few small hydropower schemes have been developed or are under construction. A Rural Electrification Fund has been established to support Rural Electricity Enterprise (REE) investment for the provision of electricity in rural areas, and funds have been provided to rural electrification developers including hydro, solar and biomass.

The introduction of improved cook stoves started in 1997. More than 800,000 improved cook stoves were sold between June 2003 and August 2009. Costing only US$4-5, the stoves have a payback time of only 60 days and could last for two to 2.5 years. Traditional stoves have a shorter lifespan. It was claimed that the initiative provides US$450,000 of added value every year. To access carbon markets, small projects were advised not to work alone but to build alliances with others.

The second working session on challenges, successes and lessons learned from climate change adaptation covered issues of impacts and adaptation recommendations for the agriculture, health, and fisheries sectors, with a discussion of financing challenges. Cambodia's agriculture sector is seen to be vulnerable to climate change as it is highly dependent on rainfall. The key message from the presentation on the agriculture sector was that projected production losses from climate change could be avoided by increasing crop productivity, increasing the planting index, and expanding planting areas. A plan for adaptation and priority setting was recommended, starting with low cost and no regret options such as finding new crop varieties resistant to drought and introducing more efficient irrigation systems.

The potential climate change impacts on the health sector were highlighted. While current knowledge levels are limited, it is recognized that mainstreaming climate change concerns into the health sector and developing capacity to deal with predicted increases in health risks are priorities.

The vulnerability of Cambodian fisheries, particularly inland fisheries, to climate change impacts was noted. It was emphasized that action to strengthen the development of alternative, sustainable livelihoods and to improve sustainable fishing policies is needed, due to the importance of fisheries' contribution to the Cambodian economy and rural livelihoods. Integration of fisheries into water allocation processes, supporting communities in fish culture, raising productivity of rice and fish through integrated farming systems, optimizing water harvesting for pond aquaculture operations in flood plains, and managing conflict associated with water allocation will all be needed. While upstream infrastructure development will pose more immediate threats to capture fisheries than climate change, there is a need to look at acceptable trade-offs and alternatives, and to make investments in fisheries forecasting and management in the context of predicted changes in the flow regime as a result of hydropower and irrigation in the Tonle Sap basin.

Given that current climate change financing and funding systems are not adequate to deal with the scope of climate change impacts, more funding and better coordination are needed. A strategy to mobilize funding was underlined as a key element in any future international agreement, so that developing countries can plan for actions in a predictable manner. While public sector finance is crucial for the initial investment, private finance is seen as an important potential contributor to climate change financing.

## Day 3

The third day began with opening remarks by the Minister of Water Resources and Meteorology and the UNDP Country Director. The Minister highlighted the lack of full understanding of climate change impacts and the discrepancy between various projections. Strengthening public awareness of the impacts was highlighted as a key need linking adaptation to the agricultural sector, particularly in switching to short term rice varieties as a means of averting water shortage issues. While the country needs affordable renewable energy, the Minister said that development needs to be sustainable, particularly in relation to hydropower development.

The UNDP Country Director noted that many countries have now started transforming their entire economies to create low carbon development pathways. Such a new development paradigm creates opportunities for sustainable economic growth. Low carbon economy initiatives could be expanded to benefit rural people. Siem Reap was put forward as a candidate for the development of a green, carbon neutral city through promotion of ecotourism and alternative sources of energy. The need for strengthened coordination to ensure optimum aid effectiveness and the need for alignment of support with the Government's development priorities were highlighted.

Working Session 3 started with a presentation on green growth in which quality of growth was highlighted. Developing countries have many available options from which to make choices regarding their development patterns.

Lessons from experiences in the EU and Germany were shared, and the role of strong policy, legislation and supporting schemes was underlined. Germany's efforts to reduce emissions have come at an initial high investment cost, but the benefits include a lower reliance on imports, more jobs, long term price stability and cheaper energy from renewable sources in the long run.

Working Session 4 began with a presentation on the National Strategic Development Plan (NSDP) Update, outlining the process through which sectoral agencies, in particular the Ministry of Environment, should incorporate climate change issues into their respective inputs to the Ministry of Planning for incorporation into the NSDP.

The need to manage climate change issues consistent with the Accra Plan of Action and the broader Paris Declaration on Aid Effectiveness was stressed. The core reform programmes were underlined as a mechanism for managing national capacity system and resourcing arrangements. Decentralization and deconcentration was identified as another important reform that could help identify challenges at the sub-national levels, so that climate change adaptation could be responsive to local needs. While more funding is expected, the need for a more coordinated approach using existing mechanisms was emphasized, with the National Climate Change Committee needed to play a coordinating role in mainstreaming climate change into the sub-national reform process.

Roundtable 1 discussed potential impacts of climate change on biodiversity and ecosystems. Global climate changes were predicted to affect both the distribution and health of ecosystems, and discussions noted the potential for climate change to exacerbate existing threats to ecosystems. Aquatic ecosystems were noted as being more significant as they are more important to the country's economy and food security. Coastal areas were identified as having the potential to be particularly vulnerable, as  tehy will be affected by sea level rise as well as by increased erosion due to more intense rainfall.

Three themes were presented and discussed in rRoundtable 2. While climate change will affect agriculture and production systems, it will have disproportionate implications for women and children. Women and children will have to shoulder increasing burdens when performing roles in the livelihoods of their household through agriculture and other income generating activities. They may have to spend a longer time fetching water, collecting firewood and wild food and working on the farm.

The objective of the regional climate change adaptation knowledge platform is to assist Asian nations to adapt to the challenges of climate change at different levels through capacity building and knowledge sharing. The platform includes the establishment of a regional system for knowledge sharing on climate change adaptation, the generation of new knowledge about climate change adaptation, and the promotion and application of new and existing knowledge about climate change in Asia. At the grassroots level, the platform provides a space to enable professionals to share their knowledge and experiences with each other. The presenter affirmed that those working with poor communities would be the first to benefit from the platform.

Cambodia is rated as one of the countries in South East Asia most vulnerable to climate change due to its level of exposure, sensitivity and low adaptation capacity. Floods and drought are predicted to become more frequent and unpredictable, and both crop production and fisheries will suffer as a result. Vector-borne and water-borne diseases such as dengue and diarrhea are also expected to increase. Some agricultural land will be affected by sea water intrusion and some coastal areas will be flooded. Approximately 20 million people in Vietnam's coastal area and the Mekong delta could suffer the effects of flooding. This will have a negative impact on regional growth and economies.

In the plenary session, a plan for discussion at the Copenhagen meeting of the Conference of Parties to the UN Framework Convention on Climate Change (UNFCCC CoP-15) was elaborated. The topics of the complex discussions expected at the conference include mitigation, adaptation, Least Developed Countries (LDCs), the Fourth Review of the Financial Mechanism of the UNFCCC, progress made in implementing the Bali Action Plan, finance and investment, and technology transfer and capacity building for mitigation and adaptation.

In the closing remarks, climate change was described as an urgent issue facing people all over the world. Countries were encouraged to seek development that is not only climate resilient but also climate smart. Developed countries were called upon to immediately make significant reductions in emissions and to transfer technology, finance and knowledge to developing countries for adapting to and mitigating climate change. Climate smart development implied that Least Developed Countries would focus on poverty reduction as well as climate resilience.

The need for low-carbon or carbon-neutral development was also stressed. Although Cambodia has not contributed significantly to climate change and is not expected to do so in the near future, the country has the will to be a part of the solution in turning the climate change crisis into a new opportunity for sustainable development. The role of the NCCC is to ensure cooperation, coordination and partnership in an equitable, transparent, efficient and credible manner. The need for assistance to build Cambodia's legal and policy framework, technical and institutional capacity, financial management systems, as well as the transfer of technology and know-how and the participation of all stakeholders, was underlined.

Finally, a draft of Cambodia's position for the Copenhagen negotiations was read and the Senior Minister and representatives from development partners were invited to "Seal the Deal," a UN initiative in the lead up to the conference in Copenhagen. The forum concluded with a press conference covered by national and international media, highlighting government ownership of the forum's results.

# PROCEEDINGS

## Inaugural Session

### Opening Remarks by Samdech Akka Maha Sena Padei Techo Hun Sen, Prime Minister of Cambodia

Beginning with the historic World Summit on Sustainable Development in 1992, the 21st century agenda and the UN assistance to national reconciliation in the country, the Prime Minister described Cambodia's signing of the United Nations Framework Convention on Climate Change (UNFCCC) in 1995 as a move towards increasing the country's contribution to addressing climate change. He acknowledged that Least Developed Countries (LDCs) will be most affected by the three main challenges of climate change: increasing temperatures, changes in rainfall patterns and sea level rise. With rice and fish as Cambodia's staple food sources and people relying on subsistence agriculture, he underlined that climate change would impact on agriculture, water resources, fisheries and the health sector, among others, leading to increased food insecurity and negative economic implications.


He also confirmed Cambodia's efforts to implement the UNFCCC and the Kyoto Protocol, as reflected through the country's engagement in implementation of the Clean Development Mechanism (CDM), Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) and the National Adaptation Programme of Action to Climate Change (NAPA), focusing on institutional capacity development. He also advised the National Climate Change Committee (NCCC) to focus its efforts on mainstreaming climate change into relevant sectors to enable the country to address its impacts.

As climate change is a great challenge facing the whole world, he affirmed that poor countries with limited capacity are most vulnerable to its effects, even if they have not been the main source of GHG emissions. He called for developed countries to accept increased responsibility under the UNFCCC. In the lead-up to the Copenhagen meeting, he reiterated Cambodia's full support for the principles of the UNFCCC's common but differentiated responsibilities, the different needs and unique circumstances of developing countries, particularly countries most vulnerable to climate change, and the right to ensure sustainable development. He also appealed for binding commitments by developed countries to step up financial support, and to make the most vulnerable countries the prime targets for assistance, particularly for implementing actions under their National Adaptation Programmes of Action.

The Prime Minister said Cambodia fully supports REDD and forest conservation, as tropical forest loss contributes almost 20 percent of overall emissions globally, but warned that the success of this mechanism would depend on a good incentive scheme, good governance, and an economic rationale to protect forests. While recognizing market failure as a cause of climate change, he noted that command-control and market mechanisms are two complementary measures that could boost technology transfer under the UNFCCC to replace existing harmful technologies and to address broader climate change issues.

In conclusion, the Prime Minister emphasized the need to develop a National Climate Change Policy, Strategy and Action Plan, mainstream climate change into national and sectoral plans, create a climate change fund, strengthen institutional and technical

capacity, increase sectoral coordination, strengthen the role of the private sector and civil society, and undertake further research as priorities for the country.

### Welcome Remarks by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

H.E. Dr. Mok started by delivering a warm welcome to Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia and Honorary Chair of the National Climate Change Committee (NCCC), and welcomed all participants to the forum. He noted that the acceptance by the Prime Minster of the position of NCCC Honorary Chair signalled a new emphasis in Cambodia's attention to addressing climate change.

Referring to the Intergovernmental Panel on Climate Change Fourth Assessment Report and the Stern Report, H.E. Dr. Mok described the potential effects of climate change and the challenges facing humanity, including global warming, sea level rise, severe, more frequent and unpredictable floods and droughts. He highlighted the loss of 20 percent of global GDP and millions of climate refugees that could result if no action was taken. He also stressed Cambodia's high vulnerability to climate change due to the fact that more than 80 percent of its population depends on agriculture and the country has limited capacity to adapt. He referred to damage caused by climate-related disasters between 1997 and 2007, including current suffering by people due to Cyclone Ketsana, as reported by the National Committee for Disaster Management.

Dr. Mok highlighted some of the Government's current efforts in response to climate change, including the establishment and strengthening of the National Climate Change Committee and the formulation and implementation of the National Adaptation Programme of Action to Climate Change and the Clean Development Mechanism projects. Noting that climate change is a cross-sectoral and multi-disciplinary issue, he urged stronger collaboration between all government agencies, development partners, civil society and the public to address the climate change issues, particularly in sharing knowledge, exchanging best practices, discussing responses to climate change, and mainstreaming climate change into policy and sectoral development plans.

In addressing climate change, Dr. Mok reminded all participants of the Prime Minister's experience in applying win-win strategies for achieving national reconciliation and peace, and asked the Prime Minister to deliver his comments and guidance to the forum.

## Opening Plenary Day II

### Welcome Remarks by Mr. Douglas Broderick, UN Resident Coordinator

Mr. Broderick welcomed participants and noted that climate change impacts such as unpredictable weather patterns, droughts and floods might push people beyond their coping capacity if they are not properly addressed. He described challenges for many sectors including agriculture, fisheries, water, the coastal zone and eco-systems. While impacts would be felt first and most severely by the poor, he said, failure to cope with them would undermine progress towards achieving the CMDGs and economic and social development overall.

Along with challenges, Mr. Broderick noted the opportunities that Cambodia might enjoy from addressing climate change issues. This included energy efficiency, renewable energy, forest protection, conservation of ecosystems and investment in Clean Development Mechanism (CDM) projects that not only address climate change but also generate income and employment. Cambodia should be aware of the consequences of inaction, particularly due to its vulnerability. Robust planning, policy and institutional frameworks and the development of appropriate infrastructure to cope with potential impacts must be in place. While trying to promote further development, he argued that actions should not exacerbate further impacts of climate change. As climate change is a cross-cutting issue, cooperation by all sectors, including the private sector, is needed.

Mr. Broderick promised that the UN would continue to support the Royal Government of Cambodia in coordination, enhancement of awareness, strengthening institutional and technical capacity, and

facilitating policy dialogue. He also emphasized the UN global campaign on "Seal the Deal" and invited everyone to join in pressuring countries to agree on a solution to climate change at the Copenhagen CoP-15. The new UN Development Assistance Framework will also include climate change to further strengthen initiatives currently supported by various UN agencies, he said.

As the world prepared for Copenhagen, Mr. Broderick noted that it was the right time for Cambodia to hold the forum. He emphasized that the deal to be reached at Copenhagen was also a deal for development, for peace in future generations and world prosperity. While the forum would end in a few days, he urged that the discussion should continue.

## Welcome Remarks by Mr. Rafael Dochao Moreno, Chargé d'Affaires, Delegation of the European Commission

Mr. Dochao Moreno started by highlighting the EU's leading role in international efforts to combat climate change, particularly in two major treaties, the UNFCCC and the Kyoto Protocol to the UNFCCC. He noted the EC's launching of the European Climate Change Programme (ECCP), leading to a comprehensive package of new policies and measures, and the EU's achievement of an Emissions Trading System for cost-effective emission reduction.

Mr. Dochao Moreno emphasized that the 15 EU member countries that ratified the Kyoto Protocl in 2002 would soon achieve their target under the Protocol of reducing emissions by 8 percent. Despite the slow progress made in recent negotiations and actions toward achieving UNFCCC goals, he said he remained optimistic about further opportunities to achieve bold goals at Copenhagen CoP-15.

He also explained that the EC has, since 2007, set out proposals and options for limiting the increase in global temperatures to 2°C as the way ahead for 2020 and beyond, as part of its integrated climate change and energy policy. As well, EU leaders have agreed to transform Europe into a highly energy efficient and low-carbon economy by cutting emissions independently, regardless of other countries' decisions. This includes a binding unconditional 20 percent reduction in greenhouse gas emissions, and a 30 percent reduction target conditional on comparable efforts by other countries. He explained that the EU's tough self-imposed actions are critical to achieving an ambitious agreement in Copenhagen. He stressed clearly that climate change is no longer an environmental issue but also a real development challenge, that mitigation must be collective, and that adaptation must start now. Saying that the current mitigation efforts will not be enough to achieve emission cuts of 25 to 40 percent and to keep the rise in temperature below 2°C, he urged other developed countries to step up and commit to more ambitious targets.

Mr. Dochao Moreno also highlighted the EU effort to assist developing countries, including the fact that the EU Action Plan on Climate Change and Development is being incorporated into all aspects of EU development policy and being funded through the EC's geographical programmes for countries and regions, and its programme for the environment and sustainable management of natural resources. The Global Climate Change Alliance was established to assist Least Developed Countries and Small Island Developing States to take part in climate change dialogue for the post-Kyoto regime. The EU would also give concrete support for adaptation and mitigation measures and for their incorporation into development strategies and programs.

Noting that the EU is one of the largest contributors to Official Development Assistance worldwide, Mr. Dochao Moreno stressed that the EU and member states will also assist the most vulnerable countries, including Cambodia, to strengthen institutional capacity to better prepare for potential consequences of climate change. He concluded with a quote from Al Gore, saying that more people would join hands to find a solution if they understood what was at stake.

## Opening Remarks by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

Noting the 10th anniversary of Cambodia's Initial National Communication to the UNFCCC, H.E. Dr. Mok described a range of achievements in institutional and technical capacity strengthening and cooperation

among concerned line ministries and development partners. He also highlighted the Government's commitment to address climate change in its Rectangular Strategy Phase II.

Dr. Mok explained the current challenges related to the limited understanding of negative climate change impacts, the need for integration of climate change into policies and plans, and the need for cooperation and coordination across government institutions and with broader stakeholders. He noted that the forum was a key starting point. He also praised recent growing interest and new climate change initiatives throughout the world, such as the EC Global Climate Change Alliance, the World Bank/ADB Pilot Programme for Climate Resilience, the Japanese Cool Earth Partnership, new initiatives of UN organizations and some bilateral organizations such as Danida, Sida, DFID, AfD, JICA, KOICA, and the emerging newer players from among certain NGOs, in addition to the traditional partners such as UNDP, UNEP and GEF.

Dr. Mok referred to the Prime Minister's speech at the opening on Cambodia's efforts to tackle climate change and the country's priorities and positions in international negotiations as a basis for further discussion to tackle climate change issues. He praised the presence of many representatives from various government ministries, development partners, the private sector, academia and NGOs including prominent experts with extensive experience and knowledge of climate change. He noted the forum's comprehensive agenda covering subject areas from basic climate change science and climate change mitigation and adaptation, to mainstreaming climate change into national policies and plans, aid effectiveness, climate change and biodiversity, communications, gender and the CoP-15 negotiations.

He proudly commended private sector and NGO involvement and noted that it was a good sign of increasing understanding and a clear indication of the market opportunities that could arise through addressing climate change issues. Finally, he praised the forum for providing an opportunity for acquiring and sharing new knowledge, skills, information and useful lessons learned, and wished the participants a fruitful discussion.

# Keynote Presentations

Three keynote presentations were made in the overview session, providing an introduction to overall understanding about climate change, the observed changes and projections, and climate change impacts. The presentations also brought a global perspective to climate change and its relationship with development, as well as a regional review of potential climate change impacts on South-East Asia's economic situation.

## Introduction – Climate Change Science, Impacts, Opportunities and the UNFCCC

*By Mr. Mozaharul Alam, Regional Climate Change Coordinator, UN Environment Programme*

Mr. Alam's presentation outlined the basic science of climate change and the aim of the UNFCCC. He summarized the signs that global warming has already occurred and set out the projections for temperature change and sea level rise to the year 2099. He gave an overview of the likely impacts of climate change in South-East Asia, discussed the need for system management to address climate change, and outlined the challenges for adaptation.

The objective of the UNFCCC is to stabilize greenhouse gas concentrations at a level that will prevent dangerous anthropogenic (human-induced) interference with the climate system, within a timeframe that allows ecosystems to adapt naturally to climate change so that food production is not threatened and economic development can proceed in a sustainable manner. However, Mr. Alam pointed out, the Convention does not define an "acceptable" level or a "dangerous" interference, nor does it set a timeframe for stabilization.

Thirty percent of energy from the Sun is reflected back into the atmosphere and 70 percent is absorbed by the Earth's surface. Greenhouse gases act like a blanket, making the Earth's atmosphere warmer and allowing life to flourish. But as the concentration of greenhouse gases increases, more heat is trapped and the atmosphere becomes warmer. Samples from the Vostok ice core show a direct relationship between carbon dioxide concentration and temperature over the past 400,000 years. The global mean temperature

rose by 0.74°C between 1906 and 2005, and is projected to rise again by between 1.8°C and 5.4°C by 2100. Analysis of sectoral impacts shows that 0.4 to 1.7 billion more people will suffer increased water stress if temperatures rise by 1°C. Ecosystem damage, coral reef bleaching, and decreased food production will also occur with a 1.4°C increase above the level of 1980-1999.

Sea levels have risen at the rate of 1.8mm per year since 1961 and 3.1mm per year since 1993. The sea level is likely to rise by 1m by next century and by five to 10 times that amount in the following centuries. Oceans will become warmer and more acid, and this acidification will damage or destroy coral reefs and the many species of marine life that live in or depend on the reefs' ecosystem services. Overfishing, runoff of nutrients and toxins from the land, and a rise in invasive species will contribute to the problem. Live coral will be reduced by 50-93 percent, and fish populations will fall by 90 percent. Seaweed populations will explode and complex habitats will be lost.

On land, glaciers in tropical zones (such as in the Peruvian Andes and on Mount Kilimanjaro in East Africa) are already retreating fast. In the temperate zone of the Indian Himalayas, Gangotri glacier retreated more than 76m between 1996 and 1999. The loss of glaciers will disrupt irrigation systems and hydroelectric installations, as well as altering the socio-economic and cultural lives of people who depend on them. Shifts in the hydrological cycle will cause regional climates to change dramatically, destroying ecosystems and making species extinct.

South-East Asia is already experiencing greater damage from intense cyclones and more frequent extreme rains, causing flash floods, landslides and floods. By the 2050s, less fresh water will be available. Coastal areas will be at risk from flooding from the sea and, in some mega-deltas, from the rivers. These changes will compound the pressures associated with rapid urbanization, industrialization and economic development, especially in coastal areas such as the Mekong delta. Rates of illness and death from diarrheal diseases will rise.

Addressing climate change will involve careful system management. Natural systems could adapt through the management of water and vegetation (carbon sequestration in forests). Agricultural adaptation and terrestrial biomass will need to be managed. Some effects can be avoided through geo-engineering to enable carbon capture and storage. But challenges for adaptation include a lack of knowledge about the impacts of climate change and the responses of natural systems, and about the connections between adaptation and mitigation options, the costs and benefits of adaptation and the trade-offs between various courses of action.

## A Global Perspective on Climate Change: Development and Climate Change

*By Ian Noble, Lead Climate Change Specialist, World Bank*

Dr. Noble said the key messages of the World Development Report 2010 are that climate change is a serious and immediate threat to development, but that a climate-smart world is possible if we act now, act together and act differently. New resources, instruments and pressures are helping to build momentum.

Global temperatures are now 0.8°C higher than in the preindustrial era, and a level of 2°C over the preindustrial level carries with it risks of large scale discontinuities. High-income countries are responsible for the majority of historical cumulative emissions, but developing countries will suffer the majority of the costs of impacts. In short, the poor will suffer most, through damage to agriculture, water and food security. Annual public subsidies for research and development in energy solutions are dwarfed by subsidies to the energy industry and petroleum products, and ambitious policies are not much more expensive than a conservative approach.

It is imperative to act now, because today's actions determine tomorrow's options, Dr. Noble said. High-income countries must take the lead. Emissions reductions in developed countries will allow developing countries to enjoy their right to have access to electricity, but all have a role to play in managing costs. The global food trade depends on a very few countries, so cooperation will help to buffer shocks. And it is crucial to act differently. Countries should aim to radically transform energy systems and to make "robust" rather than optimal decisions.

New resources are needed, as current resources committed to fighting climate change are not sufficient. There is a need for a massive scaling up to reconcile equity and efficiency. The financing challenge is to find US$250-500 billion, and while this will require all available options, it represents just 3 percent of global investments. New instruments are needed to support communities and decision makers and to find both high-tech and low-tech solutions.

The world has come a long way, Dr. Noble said. Awareness and concern are increasing, individuals and organizations are responding and politics are changing. But more is needed to turn awareness into action. This includes "soft" policy tools, such as communications and education and changes in social norms, and the creation of institutional mechanisms to deal with new challenges.

Referring to the World Bank's recently published *World Development Report*, Dr. Noble underlined that climate change is both a distinct threat and an opportunity. He said it is possible to reach the 2°C target, but acknowledged the need to act now, act together and act differently. Emphasizing that a prerequisite is a "smart world", where affordable technology can be developed, he asserted the need for political will. High income countries have contributed more emissions, while the developing world will see most of the damage. Suffering by developing countries will also be seen in the form of damage to agriculture, water and food security. While claiming that it will be possible to develop a climate-smart world, he said that the US$13 billion currently spent on research and development is very little compared to subsidies in the global energy sector.

In answer to whether we need to act now or wait till later, Mr. Noble reflected on the results from different climate models and said that precautionary policies are less expensive to implement. Recognizing that it takes time for human behaviour to change, he called on participants in the forum to act now, to act together and to act differently. He called on developed countries to take the lead. Emissions reduction in developed countries would give developing countries opportunities to exercise their right to have access to electricity.

Mr. Noble also argued for the need to act together. As emissions reductions in developing countries are possible and less costly, he argued this is possible with support from developed countries in terms of finance, technology and know-how. Acting together is needed because of the different level of climate impacts globally and because only a few countries support food security for the whole world. As different types of energy are used, emission cuts are possible from those sources, and this adds support to arguments for acting differently. He suggested it is necessary to move away from decisions that are based on cost-benefit analysis or optimal outcomes, and to go for robust decisions. He emphasized the need for changes in policies and plans, for assessments of the risk that climate change poses to those plans and for learning more about climate change. He also discussed the need to find new ways of working, not necessarily with high technology, but through changes in our behaviour and how we work together.

## The Economics of Climate Change in Southeast Asia: A Regional Review

*By Mr. Juzhon Zhuang, Assistant Chief Economist, Economics and Research Department, Asian Development Bank*

Sharing the findings from the study *The Economics of Climate Change in Southeast Asia*, Mr. Zhuang argued there are four main reasons why climate change matters to South-East Asia.

First, South-East Asia is one of the most vulnerable regions in the world. It has a tropical climate and a long coastline; people and economic activity are highly concentrated in coastal areas; it is heavily reliant on climate-sensitive sectors; and millions of people are trapped in poverty, with low capacity to adapt. Second, the climate is already changing the region. Average temperatures rose by 0.1-0.3°C every 10 years between 1950 and 2000 while rainfall declined. Sea levels rose 1-3cm each decade, and heat waves, droughts, floods and storms became more frequent and more intense. Third, the worst is yet to come. Without urgent action, Southeast Asia's mean temperate could rise by 4.8°C and the sea could rise by up to 70cm by 2100, compared with 1990 levels. Over the next few decades, dry seasons could become drier and the wet seasons could become wetter, with poor people feeling the impact more than

others. Fourth, total damage could be equivalent to losing 6.7 percent of GDP each year by the end of this century.

Mr. Zhuang emphasized that both adaptation and mitigation are needed to respond to climate change. Overall adaptive capacity should be strengthened, through greater efforts to raise public awareness, more research, better policy and planning coordination and the mainstreaming of adaptation into development planning. Proactive adaptation should be scaled up in key sectors. Water management and flood control systems should be improved. For agriculture, more efficient irrigation and new crop varieties are needed. Forests should be safeguarded and new forests planted. In coastal areas, mangroves need to be conserved and protective sea walls need to be maintained. Better health surveillance and disease prevention are needed, and infrastructure should be "climate-proofed". Above all, more effort is needed to mainstream adaptation into development planning.

While adaptation is a priority, South-East Asia should make greater efforts on mitigation. Low carbon growth brings co-benefits, Mr. Zhuang said. South-East Asia contributed 12 percent of the world's greenhouse gas emissions in 2000, but its emission rates rose twice as fast as the global average during 1990-2000. The land-use and forestry sector contributed 75 percent of the regional total of emissions, while the energy sector contributed 15 percent and agriculture contributed 8 percent. Emissions from the energy sector are growing fastest. The forestry sector has the greatest potential for reducing the region's emissions. South-East Asia also has the world's largest technical potential for mitigation, through measures such as improvements in fertilizer use, better waste management, and reform of agricultural support policies.

The energy sector holds vast potential for mitigation. Improving energy efficiency cuts emissions and saves money. It is estimated that such win-win options could eliminate 475 Mt of carbon dioxide every year by 2020, equivalent to 40 percent of the carbon dioxide emissions that would be produced that year under a 'business as usual' scenario. Other options, such as switching to other fuels, using renewable energy and carbon capture and sequestration could reduce emissions by another 40 percent at a cost of less than 1 percent of GDP.

Adaptation and mitigation require, among other things, a comprehensive policy framework, incentives for private sector action, the elimination of market distortions, and ample financial resources. Technology transfer and international funding, through channels such as the Clean Development Mechanism, are critical for the success of these efforts. Regional cooperation offers effective ways to deal with cross-border issues, such as water resources, forest fires, extreme weather events, disease outbreaks and learning and knowledge sharing. There is a need for more research and for stronger policy and planning coordination among different ministries and levels of government.

# Working Session 1: Climate Change Mitigation– Challenge, Successes and Lessons Learned

The session was designed to provide an understanding of the current mitigation initiatives and national policy, as well as the lessons learned from past and current experiences.

## The Kyoto Protocol, CDM and Voluntary Markets

*By Bridget McIntosh, Managing Director, Carbon Bridge Pte Ltd*

Ms McIntosh's presentation described the Clean Development Mechanism and explained that Cambodia has an opportunity to play a part in averting climate change and to benefit from it in the process by participating in the global carbon market.

Carbon Bridge assists countries in the Mekong to mitigate greenhouse gas emissions within the framework of an international carbon market. The carbon market grew out of the 2005 Kyoto Protocol to the UNFCCC. Industrialized countries agreed that, during the five years 2008-2012, they would cut their collective emissions of greenhouse gases to an average level 5.2 percent below the benchmark level of 1990. The protocol also sets a reduction target for each industrialized country, such as 8 percent for the EU, 7 percent for the US, and 6 percent for Japan. The protocol allows industrialized countries to meet

their targets by purchasing greenhouse emission reduction credits from projects that reduce emissions below normal. The protocol set up three "flexible mechanisms": Joint Implementation, Emissions Trading, and the Clean Development Mechanism (CDM).

Of the three mechanisms, CDM is the most relevant for developing countries, Ms McIntosh said. The approach allows technology transfer and sustainable development in host countries, where already over 5,000 emission reduction projects are being implemented. Worldwide, there are 5,416 CDM projects, including 13 registered projects in Least Developed Countries (LDCs). Cambodia has four projects approved and another two submitted. The approved projects are Kampot Cement waste heat power, the Samrong Thom Pig Farm biogas project, the TTY Cambodia biogas project and Angkor Bio Cogen Rice Husk Power.

While the CDM globally has resulted in US$95 billion worth of investment by both the private and public sectors in developing countries, Ms McIntosh noted that a "voluntary market" is also available for companies to reduce or offset their emissions outside the Kyoto Protocol and to become carbon neutral. Home-grown initiatives in Cambodia operating in the voluntary market include the Improved Cook Stoves produced and sold by GERES, and the Song Heng Rice Husk Biomass project. REDD projects also come within the voluntary market, with at least three in Cambodia under negotiation: the Wildlife Conservation Society project in Mondulkiri, the PACT project in Oddar Meanchey, and the Cardamoms project.

## Forestry and REDD: Background and Cambodian Experience

*By Dr. Keo Omaliss, Deputy Director, Department of Wildlife and Biodiversity, Forestry Administration, REDD Focal Point*

Dr. Keo's presentation gave an overview of forests in the context of climate change and the recent history of Cambodia's forests. He summarized international negotiations on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD), explained the administrative context for REDD in Cambodia, and outlined the projects that are currently preparing to participate in the REDD scheme. He outlined REDD-related activities in Cambodia and a follow-up action plan.

At present, forests cover 3,952 million ha, or about 30 percent of the world's land surface. About 12.9 million ha are lost every year, resulting in emissions of 5.8 Gt of carbon dioxide annually. These emissions from the global forest sector account for 18 percent of overall emissions. In turn, climate change causes negative impacts on forests, such as retarded growth and pest infestations. Cambodia's land area is 18,103 sq km. Of this, forests covered 13,227 sq km (73 percent) in 1965 and 10,730 sq km (59 percent) in 2006. Current uses of forest land include forest concessions, land concessions, protected areas, protected forests, community forestry and flooded forests, wildlife conservation areas, the biosphere reserve and Ramsar sites. Dr. Keo acknowledged that Cambodia's forest concessions fail to ensure sustainable forest management and the intention to make users pay for forest services has not been put into practice.

The idea for establishing REDD under the UNFCCC was first put forward at the 11th Conference of Parties to UNFCCC in Montreal (CoP-11). It was included in negotiations at CoP-13 in Bali in 2007, at the request of Papua New Guinea and Costa Rica. A decision on REDD would be made at CoP-15 in Copenhagen in December.

Dr. Keo said he sees REDD as a new mechanism to help Cambodia achieve the CMDG target of maintaining forest cover at 60 percent of the country's land area. Cambodia has been protecting and conserving its forests with support from the Government and donors, but REDD entails up-front investment and monitoring and a transparent management scheme, before the credits generated can be sold through voluntary markets.

In Cambodia, the Forestry Administration is the executive agency for REDD. It is responsible for assessing the carbon stock of the national forest and arrangements for commercializing carbon credits and forest services. The benefits of these transactions will go into scaling up forest protection and helping the participating communities. Consultations are conducted in the Technical Working

Group on Forests and Environment, which includes government ministries, multilateral agencies, donors, non-governmental organizations and international organizations, and the private sector.

REDD-related activities include participation in the REDD negotiations under the UNFCCC, dialogue with neighbouring countries through the ASEAN Regional Knowledge Network on Forests and Climate Change (ARKN FCC), training, consultations, and collaboration with bilateral and partner organizations. Cambodia has two REDD projects. A project in Oddar Meanchey, involving 12 Community Forests on 66,000 ha, has already been submitted for validation. The second, covering 180,000 ha in Keo Seima District in Mondulkiri Province, has just started.

Dr. Keo suggested a series of follow-up activities. He said the challenge is to mobilize resources to start implementing REDD projects and to strengthen the capacity of officials and stakeholders to conduct a forest inventory, and to provide training in GIS mapping and the content of REDD. As well as consulting with stakeholders and promoting regional cooperation, it is necessary to develop a national REDD Action Plan. The development of a national Carbon Account is under discussion.

In conclusion, Dr. Keo urged donors to help ensure stronger government participation the CoP-15 meeting, as without it Cambodia would have to live with decisions made by others.

## Prospects and Challenges in REDD Implementation: Vietnam's Experience towards REDD Readiness and Country Initiatives

*By Dr. Pham Manh Cuong, National Technical Advisor of the UN-REDD Programme, Department of Forestry, Ministry of Agriculture and Rural Development, Vietnam*

Dr. Pham's presentation gave an overview of forest dynamics in Vietnam and Vietnam's point of view on REDD implementation. He outlined Vietnam's experience in preparing for REDD readiness and set out prospects, constraints and challenges at both the global and national levels.

Vietnam's forests include a diverse range of ecosystems and are home to more than 25 million people, most of whom belong to ethnic minority groups who are among the poorest of the poor. Forest cover fell from 43 percent in 1943 to 28 percent in 1995, and rose again to 38.7 percent in 2008. However, while deforestation and degradation are mostly taking place along the borders, forest quality overall is being seriously degraded, he said.

Vietnam has been identified as one of the five countries most likely to be severely affected by climate change. The Government has given priority to the response through its approval of the National Target Program to Respond to Climate Change (NTP-RCC) in 2008 and the Ministry of Agriculture and Rural Development's Action Plan Framework (APF) to respond to climate change. The National Policy on Payments for Forest Ecosystem Services is being implemented, with high priority given to forest conservation, erosion control and ecotourism. REDD is prescribed in the NTP-RCC and is one of the key sub-programmes of the Sustainable Forest Management Programme of the National Forest Development Strategy. Dr. Pham noted the need to build national ownership and appropriate financial support. He underlined the need for collaboration between the national and local structure of the Government and also with development partners, especially countries in the Lower Mekong Basin.

Vietnam has actively participated in international initiatives. It submitted its country view on REDD methodology and implementation plan to the UNFCCC in February 2008. Its Readiness Project Idea Note was approved by the Forest Carbon Partnership Facility in July 2008 and discussions with the World Bank are under way. The National Joint Program was approved by the UN-REDD Policy Board Meeting in Panama in March 2009 and the UN-REDD Programme was launched on 16 July 2009.

Institutional arrangements have been put in place, bringing together the Government, NGOs and the private sector. Donor activities are being coordinated through donor meetings, an Ambassadors Forum on Climate Change, and an International NGOs Climate Change network. An institutional donors' matrix has been drawn up to mobilize support and avoid overlap

and conflicts. To build capacity, numerous national and regional technical training workshops, technical studies and public awareness raising are being conducted. A Results Framework includes the objectives of assisting the Government to develop an effective REDD regime and contributing to the broader goal of ensuring that Vietnam is REDD-ready by 2012. FAO, UNDP and UNEP have allocated a total of US$4.38 million to the budget.

Despite positive prospects, REDD faces certain constraints and challenges in Vietnam. At the global level, REDD is still new and complex. For instance, governance and financing mechanisms are still undecided, and there are technical issues over reference emissions levels, and over definitions and classifications of forest, deforestation and degradation. Institutional arrangements and policies will have to be revised to achieve the required new level of forest governance, and greater cooperation among government agencies will be necessary. There is a lack of technical capacity and reliable information, especially comprehensive forest data.

Dr. Pham said there are three main challenges for REDD in Vietnam. At present there are three forest categories with different management regulations, so there is a need for common policies. REDD will have high opportunity costs and insufficient volume of finance to shift drivers of deforestation and degradation. It will also be difficult to implement a transparent and practical payment system to share benefits among the participating households in a community.

## Renewable Energy Development in Cambodia

*By Mr. Toch Sovanna, Director, Department of Energy Technique, Ministry of Industry, Mines and Energy*

Mr. Toch's presentation gave the background to the development of renewable energy in Cambodia, summarized the completed and continuing activities related to renewable energy, and outlined the plan for future development of the sector.

Renewable energy sources in Cambodia are developing slowly compared to other countries in the region, with most technologies still undergoing research and development. The potential for wind energy is limited but potential for solar power is considerable. Cambodia has an average of six to nine hours of sunshine a day, giving it the potential to generate 5 kWh/day. Installed capacity is now about 1.5 MW, and a number of mobile phone stations and some bridge lighting systems currently use solar energy. Hydropower could generate 10,000 MW, but currently contributes less than 20MW. Biomass gassification can use agricultural residues such as rice husks, acacia, cassava, luscenia and coconut, and a number of projects have been established by foreign and local investors.

The effectiveness of generating biogas from animal waste for cooking has been demonstrated by a number of small projects. Biofuel can be produced from jatropha, palm oil and sugar cane. More than 10 companies are using jatropha, while a Korean company is producing ethanol from cassava. A proposal for a 2MW landfill gas power generation project has been submitted by a Korean company. MIME supports the project as it promises to generate electricity, reduce greenhouse gas emission and create a cleaner environment.

The Government's plan for future development of renewable energy envisages the electrification of all rural villages by 2020 using all available resources, plus the provision of grid-quality electricity to 70 percent of households by 2030. In this context, renewable energy is a potential source for off-grid supply, specifically for areas outside of the city's 40km limit. The goals of the National Policy on Rural Electrification by Renewable Energy include promoting participation by the private sector, with due consideration given to environmental protection. The Rural Electrification Fund, supported by the World Bank and the Global Environment Facility, has been established to support investments in Rural Electricity Enterprise for providing electricity in rural areas. Funds have been provided to renewable energy developers, including those working on hydro, solar and biomass. The Rural Electrification Fund provides a US$45 grant to the Rural Electricity Enterprise for each household connection to a diesel system, and US$100 for each solar home system purchased from the Rural Electricity Enterprise, with a revised scheme for people to buy on credit. About US$800 million is needed for the work, Mr. Toch said.

### GHG Mitigation by Low Cost Technology

*By Mr. Iwan Baskoro, Country Director, Groupe Energies Renouvelables, Environnement et Solidarites, (GERES)*

Mr. Baskoro's presentation outlined the facts about the GERES Improved Cook Stove and its successes in Cambodia, summarized lessons learned and challenges, and made recommendations for others considering similar ventures.

GERES promotes the use of the Improved Cook Stove through commercialization. It sold 813,794 stoves between June 2003 and August 2009, and about 450,000 families are now using them. As a result, the project reduced greenhouse gas emissions by the equivalent of 308,424 tonnes of carbon dioxide between June 2003 and December 2007. The stoves cost only US$4 to US$6, have a payback period of 60 days, and last for 2.5 years on average. They are made by 26 private micro-enterprises, distributed by 54 private distributors and sold by more than 200 retailers. The stoves provide US$450,000 in added value to the supply chain each year.

Mr. Baskoro said GERES has learned that the carbon fund is a market-based mechanism, but it is an expert domain that requires high skills and investments. Getting access to a carbon fund improves an organization's performance due to the need for auditing, and the carbon fund can balance the funding mix and permit long-term stability. But there are challenges for small projects trying to access carbon funds. These include a lack of visibility: GERES has an annual budget of less than US$1 million, while investment bank JP Morgan's profit in 2007 was US$6 billion.

Small projects should join a community of practice, such as the Carbon Special Interest Group on Cooking and Carbon, and should lobby for improvements in the Clean Development Mechanism framework. To access the carbon market, a small project should not work alone but should build alliances with others, and should talk business rather than presenting itself as a development entity. He advised projects to Think Big and set a long term goal, giving attention to quality and high standards, including the need for continual organizational improvement.

## Panel Discussion and Q&A

**Mr. Jacob Jepsen:** Mr. Jepsen commented on the need for long term investment, scale and alliances, and the importance of having a long term plan in place. He noted that investment and cost are relevant questions. As for the Clean Development Mechanism, he highlighted the considerable progress made. However, uncertainty remains with REDD and the models of public-private partnership. Both the community and the private sector need to be considered. As Cambodia is new to REDD, he recommended that a balance should be struck with poverty reduction.

**Mr. Jossy Thomas:** Mr. Thomas emphasized the need to incorporate energy efficiency and renewable energy into Cambodia's climate change mitigation strategy. However, he raised three major challenges: 1) inequitable development between countries, or between regions within a country, between the rich and the poor, between urban and rural people, and between those with and without access to clean and affordable energy; 2) energy security, given that increasing prices for fossil fuels affect developing countries and economies; and 3) the fact that climate change poses new challenges and is intertwined with energy development.

He raised the concern that Cambodia's unsustainable use of biomass continues to cause deforestation, and the increasing demand for power generation and high cost of electricity make it inaccessible to many people. Only 10 percent have access to electricity, and the demand for energy is increasing and thus the energy sector will have an increasing role in climate change. He also referred to the call in the UNEP regional coordinator's presentation for a balance between development and conservation of ecological systems and affirmed that this could be achieved through an approach to development that combines low emissions with high growth. He contended that energy efficiency and fuel substitution through the use of renewable energy sources in the energy and industry sector would be the kind of policy worth pursuing. He said locally available energy sources such as hydro, biomass and solar should be the way forward for Cambodia.

**Oknha Khaou Phallaboth:** Mr. Khaou said Kampot Cement is an approved Clean Development Mechanism project for waste heat generation (WHG). He explained the partnership between Kampot Cement and Siam Cement, with US$7 million invested in the past few months on WHG. He also spoke about his new business venture with a European conglomerate to develop rubber plantations. With reference to Dr. Pham's talk of three forest categories in Vietnam, he urged the Government to include rubber as a forest category. He noted Cambodia's need for aid for development and highlighted the recent assistance from China for road and irrigation development. Along with calling for partners to invest in heavy industries such as cement, he said he has an optimistic view on future rubber plantations and on the potential to export rice.

Mr. Khaou promised to develop wind power as his business expands to Mondulkiri and Rattanakiri, arguing that it will create a lot more jobs in rural areas and also avoid urban pollution. While his business has recently offered US$2 million in assistance for social development, through public schools, scholarships and pond building, he promised to contribute in future to addressing environment issues through approaches such as seminars. He added that most pollution is from mines and this could be dealt with through education, information, and real action such as renewable energy.

**Mr. Adison Chieu:** Mr. Chieu spoke about his Angkor Bio Cogen power plant, with 2 MW installed capacity, which uses rice husks to produce steam and electricity, thus avoiding the emission of methane and carbon dioxide. He said that this is the first project to register in Cambodia since 2006 and the decision to join the Clean Development Mechanism had helped him implement the project successfully, even though it is expensive. He noted the support provided for implementing the Clean Development Mechanism by the Government, MoE, MIME and Designated National Authority.

**Dr. Keo Omaliss:** Dr. Keo said the Government's intention is to mitigate climate change, although Cambodia is affected by climate change rather than a cause of it. Despite the Government's years of effort on adaptation, a lot more support is needed. Although Cambodia has no commitment to mitigation, the Government is still working on it. As climate change affects the people, policy should concentrate on mitigation along with helping the community.

# Working Session 2: Climate Change Adaptation – Challenges, Successes and Lessons Learned

The session looked at past and current understanding of the most vulnerable sectors including agriculture, health and fisheries and tried to understand the need for adaption funding.

## Climate Projection and Impacts, and Vulnerability and Adaptation (V&A) in Agriculture and Water Resources

*By Dr. Rizaldi Boer, Vulnerability and Adaptation Advisor, and Mr. Heng Chanthoeun, V&A Team Leader, UNDP/GEF Project on Cambodia's Second National Communication to the UNFCCC*

Dr. Boer's presentation covered Cambodia's climate now and in the future, the vulnerability of Cambodia's agricultural sector and the likely impact of climate change, and what should be done to increase agricultural resilience to climate variability and climate change.

Dr. Boer emphasized that Cambodia and Lao PDR have the lowest adaptive capacity of all South-East Asian countries. Trend analysis of rainfall data from 1960 to 2000 showed that wet season rainfall in the Tonle Sap tended to increase, causing floods, but in other areas, particularly in northeast of the country, it tended to decrease.

Projections based on an analysis of 14 General Circulation Models suggested that, under the high emissions scenario, the rainy season will start later, wet season rainfall will increase but dry season rainfall will decrease. Under a low emissions scenario, the probability is lower but the trends are similar. A detailed analysis for the Tonle Sap region suggested that, under a high emissions scenario, regional rainfall will increase and there will also be greater variability. It is likely that extreme weather events will become more frequent.

Rice contributes about 80 percent of Cambodia's total agriculture output, and most of this is produced in rain-fed (non-irrigated) fields. Thus, Cambodia's rice production depends heavily on wet season rainfall. Under a high emissions scenario, rice yields will fall by 5 percent by 2020, 25 percent by 2050 and 45 percent by 2080 compared to current levels. As a result, Cambodia might not be able to remain a rice exporting country after 2020. The key messages from the analyses are that rice production in Cambodia is sensitive to changes in wet season rainfall, that the rice farming system might be exposed to high risks of flood and drought in the future, but that the impact of climate change on rice production will be much less under a low emissions scenario than under a high emissions scenario.

Dr. Boer recommended two strategies for increasing agricultural resilience. The short-term strategy is to increase the capacity of the system to cope with current climate risks through the improvement of climate risk management and community livelihoods, and at the same time to contribute to cutting greenhouse gas emissions. The long-term strategy is to increase the resilience of the system by revitalizing development programmes. Policy makers should evaluate current programmes for addressing climate risks and designing pilot projects, such as the National Adaptation Programme of Action to Climate Change. They should also evaluate activities and research agenda to redesign, enhance or revitalize the current programmes to address current and future climate risks.

Dr. Boer's key message was that Cambodian agriculture can adapt to climate change and compensate for production losses, by adopting a number of tactics. Among these are to increase crop productivity, enhance irrigation capacity to increase the planting index, and expand rice planting to low risk areas.

## Climate Change Impacts on Health

*By Prof. Dr. Anthony J. McMichael, Expert, Climate Change and Health Project in Cambodia, WHO*

Prof. McMichael's presentation argued that human-induced climate change is happening now and that factors such as food yields, water flows, infectious agents, physical safety and social stability are being affected. These results are affecting human health and survival, but health risks should not be seen merely as "collateral damage", but as our strongest signal that climate change is potentially serious. He noted that the text of the UN Framework Convention on Climate Change refers to avoiding dangerous anthropogenic (human induced) effects on ecosystems and economic development, and avoiding damage to population health.

Prof McMichael summarized the findings of the *Vulnerability and Adaptation Assessment for Human Health, Cambodia,* which was developed by the Ministry of Health with the support of WHO and a team from the National Centre for Epidemiology and Population Health at the Australian National University. The study assesses "exposure" and "sensitivity", which together give a measure of "potential impact". This, combined with "adaptive capacity", gives a measure of "vulnerability".

The project found that Cambodia is highly exposed to risks such as floods, droughts, storms, and changes in the monsoon. Sensitivity is also high, with a large farming population living near river systems with limited health infrastructure and significant social inequality. But adaptive capacity is low due to poverty, poor education, traditional technologies, and limited collaboration between the health sector and other public sectors.

The risks are greatest for climate-sensitive health outcomes: shifts in the geographic range, seasonality and intensity of infectious diseases, especially vector-borne diseases such as malaria and dengue, malnutrition and impaired child development due to food insecurity and shortages, and the impacts of extreme weather events such as injury, death, disease and mental ill health. A good strategy helps to reduce immediate risks and increase benefits for public health in the longer term, he said. The strategy should be integrated into the public health programme and planning in other sectors. Public health capacity needs to be strengthened, reducing current risks to public health as rapidly as possible, so there will be fewer problems for climate change to amplify.

Prof. McMichael noted a case study from Lima, Peru which showed a positive correlation between the rise in temperature and the daily hospitalization rate, especially during the 1997-98 El Nino event, which

showed a 7 percent increase in diarrhea for every 1°C rise in temperature. He highlighted a WHO study of the impact on death rates around the world in 2000 of malnutrition, diarrhea, malaria and flooding, and called for a similar study in this region. A model of mosquito abundance as a function of meteorological variable has been developed for Thailand for 1985-1995 in relation to reported outbreaks of dengue fever. If such a model were developed for each country, it could be used to confidently predict how the risk of outbreaks in the short and long term would change in response to changes in climatic conditions. A study that models how climate change might increase health risks suggested that by 2085, 50-60 percent of the global population could be exposed to dengue, compared to 35 percent now.

Prof. McMichael presented a global approach to modelling, factoring in the level of humidity and the rate of survival of mosquitoes, but cautioned on the selection of climate variability data. The breeding population and larvae of mosquitoes may be in correlation with temperatures in some places but with humidity in others, he said. He gave an example of the options for adapting to climate change that are recommended in *Climate Change and Human Health*. The study recommends three projects to fight malaria in Cambodia. The first would involve surveillance of the Anopheles mosquito and a study of the regional relationship of the mosquito to climate. The second would focus on Village Malaria Workers to improve education and treatment of malaria in rural areas. The third would provide long-lasting impregnation of bed nets and residual spraying of houses.

## Climate Change Vulnerability and Adaptation in the Fisheries Sector

*By Dr. Edward H. Allison, Climate Change Director, WorldFish Center, Penang, Malaysia*

Dr. Allison's presentation established the importance of fisheries to the Mekong region and Cambodia in particular. He explained the pathways through which climate change affects fisheries and aquaculture, and why they are vulnerable. He summarized the key principles for adapting fisheries and aquaculture, outlined measures and knowledge needed for planning adaptation in the Mekong region and Cambodia, and recommended a series of management and policy moves.

Mekong fisheries are crucially important to regional economies, rural society and food security, Dr. Allison said. The river system produces 2.6 million tonnes of fish and other aquatic animals per year, with a value of more than US$2 billion at first sale. In Cambodia, production from capture fisheries has ranged from 300,000 to 450,000 tonnes per year, while aquaculture produced 33,500 tonnes in 2006 and is growing rapidly. Cambodia's capture fisheries rank fourth in tonnage after China, India and Bangladesh, but in terms of "catch per person per year" it is the most intensive inland fishery in the world.

Fisheries contribute 8 to 12 percent of Cambodia's GDP, a contribution valued at US$469 million in 2004. Fish also provide 65-79 percent of the animal protein requirements of Cambodians, with people on average consuming 100 grams of fish every day of the year, three times the amount of pork they consume and 20 times the amount of chicken.

Explaining the pathways through which climate change will affect fisheries, Dr. Allison said global warming would create changes in rainfall, river flows and lake levels. These will affect production ecology, with impacts on fish production and yield and fish distribution, and the wider society and economy, with impacts on water allocation. An assessment of the vulnerability of 132 countries' fisheries sectors to climate change ranks Cambodia at number 30, putting it in the most vulnerable quartile.

Dr. Allison shared the WorldFish Center's key principles for adapting fisheries and aquaculture to climate change. The first is to build on existing adaptations such as diverse livelihoods, institutions that enable mobility, and the holding of wealth in assets with high liquidity. The second is to support existing development initiatives that target the rural poor and encourage sustainable fishing policies – approaches that he described as a "no regret" strategy. The third is to prioritise additional climate-specific actions at local level, using a participatory diagnostic approach.

To build adaptive capacity in the Mekong region, the priorities are to integrate fisheries into analysis

of local agrosystems so that water allocation can be improved, and to support a culture of community based fisheries. The productivity of both rice and fish farming should be improved through integrated agriculture and aquaculture systems, and water harvesting should be optimized so that there can be pond aquaculture operations in flood plains. As well, it will be important to manage conflicts associated with water allocation and water quality in the Mekong delta.

The measures proposed in Cambodia's National Adaptation Programme of Action to Climate Change are mostly focused on increasing capacity for water management, stocking reservoirs and ponds for aquaculture, and protecting coastal areas, Dr Allison said. But it is also necessary to respond to the development of infrastructure upstream, which poses a more immediate threat than climate change. Along with this, there is a need to invest in fisheries forecasting and management in the context of predicted changes in the flow regime that will result from hydropower and irrigation in the Mekong basin.

But there are many gaps in the knowledge needed for successful planning. There is a need to develop better climate modelling in coastal areas and at the river basin level. For inland fisheries, research should focus on flow and lake level as key drivers of fishery systems. It is necessary to develop indicators of current adaptive capacity and vulnerabilities, and to identify the most vulnerable people, regions and sub-sectors. Options for better management and adaptation, such as low-cost netting to prevent stock loss from aquaculture ponds during floods, need to be identified and tested. The cost-benefit balance and trade-offs between productive activities such as rice and fish farming need to be analysed to retain resilience to climate change. Stakeholders need to be engaged in capacity building, dialogue and planning, and developing scenarios to identify other drivers of social and ecological change.

Dr Allison offered a set of recommendations for managing the fisheries sector. First, use co-management and a broad ecosystem-based approach to obtain healthy fish stocks and fish habitats. Second, reduce fishing pressure on habitats that are critical for maintaining climate-related ecosystem services, such as floodplain forests and mangroves. Third, design "climate-proof" infrastructure and technologies for aquaculture and other coastal livelihood activities. Fourth, manage access to coastal and floodplain resources in an integrated way to help sustain diversified livelihoods and reduce dependence on fisheries.

At the policy level, Dr. Allison recommended integrating the fisheries sector into an array of policies and planning mechanisms. Adaptation plans for fisheries and aquaculture should be included in the National Adaptation Programme of Action to Climate Change, he said. Communities that depend on fishing should be integrated into national and decentralized economic plans, such as the national poverty reduction strategy. The fisheries sector should be incorporated in planning for disaster response. Policies should be developed to secure fish supplies through a combination of well-managed capture fisheries, sustainable aquaculture and imports when necessary. Overall, the Government should maintain a policy environment that is conducive to the pursuit of diverse, adaptive livelihood strategies. This would include, for instance, avoiding commodity and market taxes and avoiding sectoral approaches to rural development.

## Financing for Climate Action in Developing Countries

*By Mr. Bert Maerten, Climate Change Campaign Leader, Oxfam International*

Mr. Maerten argued that finance for adaptation in developing countries is essential, and it can be sourced from both the public and private sectors. Although estimates of the amounts needed are rising, the total is still small compared with the sums generated each year by the developed economies. But adaptation finance must be additional to existing aid and must be governed carefully to allow for the greater voice of developing countries, accountability and trust.

Adaptation finance is needed because climate change is already slowing progress towards the 2015 Millennium Development Goal targets, Mr. Maerten said. The poorest countries lack resources to implement adaptation programmes and need predictable flows of finance so that they can contribute to global

mitigation actions. Finance is critical for providing incentives for strategic investments that will have long-term returns. By providing finance, developed countries will build trust that they are serious about tackling climate change. Public investment is needed because private investment is still limited, and it can generate economic growth and stabilize the private sector during periods such as the recent economic crisis.

How much money is required? Estimates range from US15 billion to the World Bank's 2009 figure of US$75-100 billion per year, for the period from 2010 to 2050, Mr. Maerten said. Oxfam itself is calling for more than US$50 billion immediately and estimates that the additional costs of mitigation in developing countries will amount for a minimum of US$100 billion a year by 2020. If this seems like an unrealistic figure, he said, bear in mind that US$150 billion was spent to bail out a single US bank (AIG) and US$50 billion is only 0.1 percent of industrialized countries' GDP. Estimates of the cost of adaptation are continuing to rise and are probably still too low, given that they exclude some sectors and ignore the costs of addressing pre-existing vulnerabilities in the sectors that they include.

Developed countries should agree to provide near-term finance, including US$2 billion for the Least Developed Countries Fund, starting from 2010-2012 if there is a global deal in place by 2012 to deliver longer term financing. This funding would allow vulnerable developing countries to take urgent actions such as institutional capacity building and knowledge generation. Public finance from various innovative sources, including auctioning international and domestic emission allowances, can provide predictable, guaranteed and additional funds at the scale required. It is essential that these be established at the international level because national-level budget processes are unpredictable. Private finance flows are an important supplement to public finance, but must not be double counted.

It is also crucial that money for adaptation be additional to Official Development Assistance, as development gains will be lost if ODA is cannibalized to pay for adaptation. But the existing channels for aid are inappropriate, because climate finance is not aid, developing countries are not adequately represented in aid governance, and the current architecture for aid delivery is highly fragmented. To ensure good governance of financial flows, the poorest counties need to have a voice in disbursement. The funds should be under the authority of the UNFCCC Conference of Parties to ensure greater accountability to both contributors and recipients, plus coherence and transparency. Oversight by the Conference of Parties could build trust, helping to seal a global deal.

## Panel Discussion and Q&A

**Mr. Aminul Islam:** Although climate change would have impacts on many sectors, and would occur everywhere, all the time, only a few aspects of climate change impacts were discussed, Mr. Islam said. He described the three types of adaptation: spontaneous adaptation where people at grassroots level adapt in various sectors through their own actions; planned adaptation in which the Government and institutions plan and budget for various time ranges; and reactive or anticipatory remedial actions in response to events.

He shared experiences from Bangladesh, including the following:

- Floating agriculture areas to adapt to the climate change impacts;
- Changes in crop calendar and land use, to respond to the change in patterns of rainfall and climate variability;
- Improvement of agriculture productivity, taking into account not only rainfall but also parameters such as temperature, soil microbes, land degradation, while expansion of agriculture must consider ecosystems from the perspective of temperature, humidity changes, and other factors;
- Flash flood cell phone warning system.

He also shared five points regarding policy experiences in Bangladesh:

- National adaptation/climate change strategy and

action plan provided for each sector and civil society with responsibility. Six thematic areas with project concepts and action plans provided for food security, water security, disaster management, sciences and research;

- A Climate Change Trust Fund created with multi-million dollar contributions from both the Government's own funds and multilateral funds for implementation of climate change strategies and action plans;
- Technology and knowledge were needed to act differently but should not treat the situation as business as usual, particularly in agriculture and health. Education curricula were updated to prepare human resources for adaptation and mitigation and with research organizations engaged in all the sectoral issues;
- Each government ministry and agency had a focal point or network for scientifically based decisions, engaging consultative and harmonized process of all ministries. Leadership from all parties received orientation to take actions on climate;
- Media trained on climate change to cover for news comprehensively and with an integrated approach.

**Dr. Ian Noble:** Dr. Noble noted that adaptation needs to be tackled with distinct purpose and activities. Regarding obligations to provide finance and knowledge sharing, he agreed that existing mechanisms are not appropriate but are still needed in delivering the adaptation.

He posed a number of challenging questions as to how climate resilience can be incorporated into the complexity of human society from the household level to the government. He suggested thinking from other perspectives by saying that we do know more than what we think we know and we should think of what and how things could be done to change the pathway of climate change.

He recommended a move away from the "predict and act" approach and argued for caution on what should be in the news, so that coverage provides cautious advice rather than showing a sad story. Mr. Noble commented that the world keeps changing, much more information is now available and the modelling will also be available in the near future.

# Opening Plenary - Day III

## Opening Remarks by H.E. Lim Kean Hor, Minister of Water Resources and Meteorology

Saying climate change was not a new issue to the world, H.E. Mr. Lim reminded the audience of past events including the disappearance of dinosaurs and mammoths. He explained the two different institutional arrangements used for addressing climate change, one in which climate change remains with environmental agency, as happens in Cambodia, Lao PDR and the Philippines, and those that operate under the national meteorological institution, as happens in France, Japan and Malaysia. He said this has implications for understanding climate change.

H.E. Mr. Lim noted the lack of full understanding about the impacts of climate change and the distinction between climate change and climate variability. He then reminded listeners of the use of models in projecting climate change that had to be kept updated. Although substantial differences in projection results have been highlighted, he acknowledged that we are now in a situation where climate change is being discussed. Specifically for Cambodia, he described the effects of climate events such as El Niño in 1963, 1979, 1997, 2002 and 2004, the Dipole Index in 1997 and 1998 and La Niña in 2001-2002. He gave a summary of analysis of observed rainfall for both dry seasons and wet seasons, average temperatures and mean minimum temperatures, with all showing an increase in value. He contended that tropical storms had never originated in the country, but in the Pacific and travelled across Vietnam and mostly reached areas close to the border with Cambodia, with the most recent, Ketsana, being particularly damaging.

H.E. Mr. Lim said there is a need for public awareness about the causes and impacts of climate change. He also emphasized the need for continued monitoring and giving the people timely forecasts. With this he made a commitment to build an international standard meteorology center within the Government's current term, so that farmers can be informed earlier of the likely occurrence of drought

or storms and be better able to prevent damage. For agriculture, increasing capacity for water management is important to ensure water is available for farming in the dry season and also to avoid flood damage in the wet season, he said. The importance of the sector was reflected in the fact that it contributes 36 percent of Cambodia's GDP. He said that changing from long term rice varieties to short term varieties should avoid impacts from drought, but acknowledged that changing people's traditional practices is rather difficult. He also noted the effort by the Ministry of Water Resources and Meteorology in collaboration with development partners in securing a sea wall in Prey Nup.

While asserting that development must be sustainable, H.E. Mr. Lim said he intervened in addressing the impacts of hydropower development in the countries upstream of the Mekong not only in the National Mekong Committee but also at the government level. He argued that hydropower provides a renewable energy solution to the much needed electricity for the country development, as Cambodia did not have many other alternative sources of renewable energy and would not be able to depend too much on biomass as a source of energy. He noted the difficulty in seeking investment in hydropower development and irrigation schemes, for which Cambodia has potential.

H.E. Lim ended his speech by acknowledging the need for continued international cooperation in addressing climate change, although the country was not the cause of impacts.

### Remarks by Mr. Jo Scheuer, Country Director, UNDP Cambodia

Noting that many countries have now started transformation of their entire economies to create low-carbon development pathways, Mr. Scheuer noted that such a new development paradigm creates opportunities for sustainable economic growth. He suggested that Cambodia could do similarly by accessing different sources of finance and transfer of technologies. Both the Government and the private sector need to work together to integrate energy efficiency into business policy and investment plans.

Mr. Scheuer suggested some low carbon economy initiatives that could be expanded to benefit rural people. He suggested that Siem Reap could be turned into a green, carbon-neutral city so that the tourist industry and airlines could commit to reducing emissions through alternative sources of energy. He explained a comprehensive plan that could be developed to help Siem Reap become a green city, including renewable energy and energy efficiency.

He also said that such an effort needs development partners, civil society and the private sector to be involved. Good coordination will be needed to ensure optimum aid effectiveness. All initiatives need to be aligned with the Government's development priorities. He noted that substantially more resources will be available for Cambodia to address climate change, thus coordination and information sharing are necessary to ensure an efficient and effective national response.

Mr. Scheuer emphasized the role that Cambodia's forests, if well protected, could play in providing ecosystem services that could contribute to climate change mitigation and adaptation, while also providing a source of income, for example through REDD. While climate change is known to most severely impact the poor, particularly women, disproportionately affecting their livelihoods and security, he argued that it is necessary to create an enabling environment for their participation so that they can better prepare and manage their livelihoods and contribute to families and communities.

He concluded by saying that climate change is also a development issues and that UNDP views it from the perspective of poverty reduction and human development. He encouraged Cambodia to take the lead in building a green, low carbon economy and noted that the forum marked the beginning for moves to harness the opportunities of a low carbon economy and to reduce vulnerability.

# Working Session 3: Toward a Low-Carbon Society

## Towards a Low-Carbon Society

*By Mr. Masakazu Ichimura, Chief, Environment and Development Policy Section, Environment and Sustainable Development Division, UNESCAP*

Mr. Ichimura argued that low carbon development is not only necessary, but is also a feasible and practical option. "Green growth" provides a useful strategy by highlighting eco-efficiency, but ensuring policy coherence and coordination is critical. A wide range of socio-economic policy options are available, and UNESCAP can support institutional and human capacity development with innovative policy ideas.

Asia and the Pacific face numerous socio-economic challenges, with 912 million people living below the international poverty line of US$1.25 a day, equivalent to 66.4 percent of the world's poor. The effects are seen in indicators such as health, with 4 million children dying before the age of five every year, and 566 million rural residents living without access to clean water. The Asia-Pacific is living beyond its "environmental means". Population density is 1.5 times the global average, while productive area available per capita is 60 percent of the global average. In this context, the approach of "maintain the growth first and clean up later" is not an option.

Green growth, which was adopted as the strategy for the region at the 5th Ministerial Conference on Environment and Development in 2005, aims to achieve economic growth and improve quality of life without compromising environmental sustainability. It aims to achieve MDG1 (poverty reduction) and MDG7 (environmental sustainability) at the same time. While traditional economic growth aims to maximize outputs, or "economic goods", it increases "environmental bads" as well. Different patterns of growth produce different outcomes. For instance, an index of ecological footprints gives Japan a score of 4.3, the UK 5.6, Australia 7.0 and the US 9.7. The differences stem from factors including socio-economic structure, infrastructure, consumption patterns and lifestyles, and public policy. For instance, transport in the US is largely motorized, while Japan and the EU use integrated networks of railways and motorways.

In the context of climate change, green growth means low carbon development. Under current settings, climate change is expected to reduce GDP in South East Asia by 6.7 percent a year by 2100. But this GDP loss will fall to 3.4 percent if actions are taken to limit the increase in global temperatures to 2°C. Some people are concerned about increasing emissions from China, India and Brazil, but Mr. Ichimura said these countries' emissions per capita are still much lower than developed countries. They thus have potential to raise their human development outcomes without producing more per capita emissions, and such a move would not be very costly.

Already, green growth is being mainstreamed into national, regional, international mechanisms and UN-wide activities. Cambodia has established an Inter-Ministry Commission and a Green Growth Roadmap with ESCAP assistance. Policy tracks include green taxes and budget reform, sustainable and eco-efficient infrastructure and supply of services, greening of business and markets, sustainable consumption, investment in natural capital and tools for benchmarking progress. Green growth provides an opportunity for holistic thinking for all actions, particularly by the public sector.

There are several keys to success for low carbon development and green growth, Mr. Ichimura said. Vision and political will at the highest level are vital. Awareness and technical skills are needed in ministries across government. Institutional mechanisms are required to ensure that policies are coherent and coordinated. And public support must be developed through participation and partnerships in relation to benefit sharing.

UNESCAP can help by assisting with institutional development. In Cambodia, it has already supported the establishment of the Inter-Ministry Working Group on Green Growth and the National Green Growth Roadmap. It provides support for capacity building in green growth, networking among countries and stakeholders, and the incubation and dissemination of innovative policy ideas.

# Panel Discussion and Q&A

**Mr. Ajay Markanday:** Mr. Markanday asked if a low carbon society and technology were economically feasible, and if the policy option would be relevance in the Cambodia context.

**Mr. Jeroen Verschelling:** Congratulated the Secretariat of State of MIME for the recent tax reduction from 35 percent to 7 percent, Mr. Veschelling pointed to it as a good step. He then asked the speaker if Cambodia or regional economy is vulnerable to oil prices. Taking the example of a hotel's monthly electricity bill between US$100,000 and US$200,000, he commented that with a low carbon economy a country would be less vulnerable to oil price changes.

**Dr. Andrew Mears:** Acknowledging the implications promoting both green resource based production and markets, Dr. Mears said that the challenges for Cambodia in developing a green growth policy lie in balancing the development of industry, with environmentally and socially sustainable use of natural resources. While access to the international green market is an opportunity for new productivity, green markets can be premium markets and accessing the premium market is not always within the reach of rural people or producers. Thus it will be necessary for intermediaries to take a strong role. In terms of the development of resources and processes and access to markets, Dr. Mears asked if there is guidance to ensure that the green opportunity is equitable and if different elements of society can obtain broad access to these benefits.

**Mr. Masakazu Ichimura:** Mr. Ichimura assured the conference that green growth is relevant to Cambodia, but acknowledged that the question of which parts of green growth are most relevant is still under discussion. He added that UNESCAP has provided new ideas but said the discussion is now still going on within Cambodia, not only within the Government.

He raised the issue of vulnerability and development toward enhancing resilience, and said that many uncertainties and crises lie in the future, including financial, food, and climate change impacts. He said that green growth provides a good package for the country to improve its resilience in the longer run. He said that many countries suffer from economic recession because they are too reliant on high carbon, export-based manufacturing industry. To achieve a resilient economy in the future, countries should start improving this sector.

Mr. Ichimura added that competition is strong in the external market, so strengthening production by looking into the future image of Cambodia industry is essential for the country's economy to survive. Korea, which was formerly dependent on high carbon, export-based manufacturing industry, has now shifted from heavy industry to more knowledge and service-based industries. Commenting on tax, he said that the changes are not about imposing more tax, but about differentiating between polluting sectors and the green sector.

**Mr. Koch Savath:** Mr. Koch said Cambodia is the first country in the region to receive assistance from the Republic of Korea through KOIKA and UNESCAP to implement green growth and sustainable development tools. In early 2009, the Ministry of Environment worked with all relevant ministries to prepare a national development road map to reconcile the Government development and environmental goals. He affirmed the Inter-Ministry Working Group agreement to develop short, medium and long term projects for incorporation in the road map and in the ministries' respective sectoral plans to contribute to environmental protection, sustainable agriculture, sustainable infrastructure, trade and industry, sustainable management of forest and water resources, renewable energy, sustainable infrastructure and green transportation, as well as the development of green villages and wise management of waste.

**Mr. Dominique Catry:** Mr. Catry outlined the difficulty in drawing experiences from the developed or even from the fast growing developing countries to compare with the situation in Cambodia, as this country is at an early stage of electricity energy. Since electricity is expensive, there is high development potential for renewable energy. He described Comin Khmer's involvement in the development of a large power plant in the country, but also in the promotion and development of renewable energy sources such as solar, wind power, biomass, and biogas. He called for more support and incentives from the authorities. The high cost of electricity also encouraged consumers

to save on their electricity bills. He described Comin Khmer's growing engagement in energy saving by doing energy consumption audits, implementing energy saving solutions, including high efficiency air conditioners, low consumption lighting features, and variable speed drives. He also said that one of the largest consumers in town is interested in having Comin Khmer conduct an audit to cut its electricity consumption by 20 percent. He asked whether other organizations had made such a contribution so as to persuade the authority to be more supportive on tax or import exemption, and also to encourage the electricity authority to buy energy produced through renewable energy equipment by private consumers as a way of encouraging production of renewable energy.

## Climate Policy in the EU and Germany: Development of Renewable Energies

*By Dr. Georg Maue, Senior Expert for Climate and Energy Policy, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany*

Dr. Maue described how Germany's commitment to ambitious reduction targets has led it to rapidly develop the ability to cut greenhouse gas emissions. The changes are being achieved without significant costs and are yielding major "co-benefits", including better energy security and a large number of new jobs in the renewable energy industry.

Germany and the EU have decided on very ambitious targets in line with the recommendations of the Intergovernmental Panel on Climate Change. In 2007, the EU Council set a binding target to reduce greenhouse gas emissions by 20 percent below 1990 levels by 2020 and a conditional target to reduce emissions by 30 percent by the same date if other industrialized countries are willing to make comparable cuts. In 2008, Germany's instituted its Integrated Energy and Climate Programme, which adopts the EU targets. For Germany, a 30 percent reduction in greenhouse gas emissions by 2020 translates into a 40 percent cut from 2006 levels. The climate and energy package also commits Germany to sourcing 20 percent of its final energy consumption from renewable energy by 2020, and 10 percent of fuel for transport from biofuels, with production being sustainable and second generation biofuels commercially available.

But the policies required to make the reductions are already available and costs are moderate, Dr. Maue said. They include "cap and trade" systems such as the EU's Emissions Trading System (ETS), and changes to building codes, fuel specifications, and fuel and appliance efficiency standards. Governments can raise performance standards for power plants, choose green taxes and remove subsidies for fossil fuels. These and other measures would amount to only a 0.12 percent reduction in global GDP growth.

The "Minus 40 Percent Package" of laws and regulations targets eight main sectors: electricity, heat in buildings, energy efficiency, non-energy, power plants, traffic, combined heat and power, and heat from renewable energy sources. Considerable co-benefits are expected. These include independence from energy imports and rising energy costs, with no loss of comfort. Nuclear energy will not be needed due to greater efficiency and use of renewable, so there will be no reactor accidents, nuclear waste or proliferation of nuclear weapons. All mitigation can be achieved with existing technologies, and early action puts Germany in a good position for exporting low-carbon technologies. The benefits will outweigh the costs by €5 billion, and create co-benefits such as employment and energy independence.

Renewable energies are a key part of the German programme. The package sets a binding target to increase the proportion of electricity generated from renewables to more than 30 percent by 2020, and the proportion of heat generated by renewables to 14 percent. The main instrument is the Renewable Energy Act, which establishes the "feed-in tariff" system. This gives renewable energy priority access to the power grid and priority for transmission and distribution. Grid operators are obliged to buy electricity produced and fed in to the grid from renewable energy sources, and there is a fixed price (or "tariff") for every kilowatt hour produced from renewables for the next 20 years. Energy suppliers are allowed to charge the tariffs in the final electricity price to consumers. Some customers complained that electricity was more expensive in Germany than in the US, but in fact the price was only 5 percent higher, Dr. Maue said. The cost of renewable energy was now falling while the price of fossil fuels was rising. An assessment of renewables in Germany in 2008 found that using them avoided the emission of 109 million tonnes of carbon

dioxide, while the renewable energy sector had total turnover of €28.8 billion and employed 278,000 people.

While Germany and Cambodia have very different economies, some aspects of the German experience are useful and relevant for Cambodia. Mitigation is a high priority in Germany, while it is a secondary concern in Cambodia, but both countries have high potential in this area. Germany's policy on mitigation is set, while Cambodia's is still in the investigation and planning stage. Renewable energy has been given priority in Germany's policy, and this strong support is driving rapid development. In Cambodia, while little renewable energy is being used, there is high potential, especially for solar and biomass systems. Similarly, energy efficiency is given high priority in Germany but both countries have high potential.

Germany's success story is built on binding targets and laws, which provide financial support and feed-in tariffs, Dr. Maue said. Renewable energy will be the biggest source of electricity in the mid-term, with viable market prices. In Germany's case, mid-term financial support is required to assist with high abatement costs in the beginning, but the co-benefits include lower energy imports, leading to greater energy security, plus more jobs and long-term price stability. Germany has quickly developed a new policy, and through this policy it has changed the world.

## Panel Discussion and Q&A

**Mr. Dominique Catry:** Mr. Catry asked if the emission reduction policy had any impacts on the competitiveness of Germany industry and whether they were negative. He questioned the claim that nuclear cannot be a solution as it is costly, and asked for more elaboration, saying nuclear energy is also a low emission option.

**Dr. Georg Maue:** Responding to the question, Dr. Maue explained that Cambodia could benefit from the ability to upscale renewable energy. One opportunity is for decentralized energy services that could add value to livelihoods and productive activities, and this is particularly important when implementing green growth. He reemphasized the need for policies that are conducive to realizing commitments at the national level, as well as having sub-national entities and private enterprises adopt the actions.

He said the strong legal instrument on emission trading system that was introduced in 2005 in Europe consolidated 27 existing national cap targets and policies. As a result, 100 percent auctioning is taking place, so that producers have to pay for each tonne they emit. He said that climate change policy offers a lot of opportunities. With the introduction of energy efficiency, the tax burden will be reduced. With the introduction of energy efficiency in an energy intensive sector, competitive advantages will also be generated. The sectors facing significant global competition will be protected under emissions trading until 2020.

As for nuclear energy, Dr Maue confirmed that only 2 percent of global energy supply is from nuclear energy and if nuclear energy were adopted as a strategy for emission reduction about 2,000 new (1400 new – according to a International Atomic Energy Agency report) nuclear plants would have to be built from now, equivalent to 35 each year till 2050. The construction cost would be of €3-20 million each and as opposed to renewable energy, the nuclear energy would not be readily available for use in the first year.

**Mr. Jeroen Verschelling:** As 80 percent of rural people do not have grid electricity, Mr. Verschelling said there is a market for small solar systems. However, since there is not much of an electronics industry, he assumed the market would be modest. His concern was how the quality products would compete with others, and that when the solar systems broke they would be difficult to fix. Quality is important for solar products, he said, but if rural people buy costly products that cannot be fixed, the reputation of solar power systems will be damaged.

**Dr. Georg Maue:** Dr. Maue outlined some of the difficulties Germany had in the initial stages of developing wind and solar energy. As for high quality solar modules, he said some experts said they were not very different from those produced in China. He affirmed the need for repair facilities to be in place for the decentralized renewable energy industry to grow. Only 15 percent of the jobs are associated with making the product, while the remainder are in construction and services. Infrastructure and quality are equally important, he said.

# Working Session 4: NSDP, Climate Change and Aid Effectiveness and Coordination

The session reflected on the Government's policy process and the framework in which climate change interventions could be mainstreamed, and also on how aid mechanisms could provide the basis for financing green growth and ensuring aid accountability.

### Development Process of the National Strategic Development Plan Update (2009-2013)

*By Mr. Poch Sovanndy, Deputy Director General, Ministry of Planning*

Mr. Poch's presentation outlined the background to Cambodia's national development planning process and described in more detail how the National Strategic Development Plan Update (2009-2013) is being drawn up. He also summarized the roles played by the various responsible agencies.

Mr. Poch said that before the National Strategic Development Plan (2006-2010) was prepared, there were so many different policy documents that sub-national entities were confused about how to develop their plans. The documents included the *Socio-economic Rehabilitation and Development Plan* **(1994-95),** the five-year *Socio-economic Development Plan* (first 1996-2000 and second 2001-2005), the *Cambodia Millennium Development Goals* (2003), the *National Poverty Reduction Strategy* (2003), and the *National Population Policy* (2003), as well as the *Rectangular Strategy for Growth, Employment, Equity and Efficiency.*

In accordance with Cambodia's Action Plan on Harmonization and Alignment (2004-2008) the Government led the process of developing a single, unified plan, incorporating all its policies, plans and strategic priorities, and this became the National Strategic Development Plan (2006-2010). The Government then decided to align the NSDP with the Fourth Mandate of the National Assembly (2008-2013), and this led to the current process of the NSDP Update (2009-2013). The final draft of the NSDP Update was expected to be adopted in March 2010.

The NSDP Update is consistent with the format of the Rectangular Strategy Phase II. It continues the original plan's focus on speedy poverty reduction, achieving the CMDGs, and ensuring macro-economic stability and promoting broad-based growth. It incorporates a review of the progress made so far. The aim is to assess Cambodia's opportunities and risks, to review and define new priorities, programs and project proposals, and make new projections for Cambodia's socio-economic development for the phase ending in 2013. The structure of the document is as follows: i) Introduction, ii) Main achievements and challenges; iii) Macro-economic framework; iv) Main policies and actions; v) Spending resources and programmes; vi) Monitoring and evaluation; and vii) Conclusions.

Guided by the Government's circular and concept note, in May 2009 the Ministry of Planning (MoP) asked all relevant agencies to provide inputs. Sectoral agencies were encouraged to work through the Technical Working Groups. To prepare the draft, MoP worked closely with three central agencies: the Ministry of Economy and Finance, the Cambodia Rehabilitation and Development Board of the Council for the Development of Cambodia, and the Supreme National Economic Council. The first draft was circulated for comments from sectoral agencies and development partners, and the revised draft was scheduled to be submitted to an inter-ministerial consultative workshop in December 2009. It was expected the Council of Ministers would endorse the plan in February 2010, before it was debated in the National Assembly and the Senate, and finally signed and promulgated by the King in April 2010.

# Panel Discussion and Q&A

**Mr. Jacob Jepsen:** Since climate change is a cross-cutting theme, Mr. Jepsen asked how the Government ensures that climate change issues are not lost, especially since there is no Technical Working Group on Climate Change.

**Mr. Poch Sovanndy:** Mr. Poch said the preparation involves all relevant sectoral agencies and since MoE is the lead agency responsible for climate change and other agencies give input where it is relevant, the issue of climate change is considered as part of the sectoral input.

## Ensuring a Coordinated Response to Climate Change: Identifying Relevant Aid Effectiveness Principles

*By H.E. Mr. Chhieng Yanara, Secretary General of the Cambodia Rehabilitation and Development Board (CRDB) and Deputy Secretary General of the Council for the Development of Cambodia (CDC)*

H.E. Mr Chhieng said that aid effectiveness must support capacity development that enables adaptation to climate change. Commitment, partnership and experience make it possible to put effective principles in place from the outset, he said. The most significant challenges are fragmented support, capacity challenges and the need to coordinate many stakeholders. This coordination of Government, development partners and civil society must be managed within a coherent institutional framework led by the National Committee for Climate Change (NCCC). The Cambodia Rehabilitation and Development Board of the Council for the Development of Cambodia (CRDB/CDC) fully supports the process and can assist in developing capacities and structures for managing aid.

Aid effectiveness means supporting a response that develops capacity for adaptation at national and sub-national levels and across all sectors, Mr Chhieng said. This can be done by building on both national and global frameworks. The National Strategic Development Plan provides the national framework for integrating the National Adaptation Programme of Action to Climate Change (NAPA) into government programmes and addressing climate change priorities across all sectors. Public Administration Reform and Public Financial Management Reform provide entry points for developing capacity and allocating resources in a coordinated and sustainable manner. The decentralization and deconcentration reforms provide an entry point for ensuring that sub-national activities are consistent with climate change adaptation. Cambodia's aid management structures, principles and priorities are well suited to the integration and promotion of climate change adaptation. Moreover, the Accra Agenda for Action and the broader Paris Declaration on Aid Effectiveness are a mechanism for increasing global convergence between aid effectiveness principles and the climate change agenda. However, Mr. Chhieng sounded a cautious note regarding two challenges: the likelihood that the Technical Working Group (TWG) debates may not pay sufficient attention to cross-cutting issues, and the risk that issues such as disaster management and preparedness could be precluded from the TWG structure. It will be up to the NCCC to incorporate and manage links with these initiatives and reforms, he said.

Under Cambodia's aid management structure, the 19 TWGs provide input to the Government-Deve lopment Partner Coordination Committee, and the process is overseen by the Cambodia Development Cooperation Forum. Mr. Chhieng called for integrating adaptation issues in the National Strategic Development Plan Update and establishing institutional linkages for managing financing and monitoring. He highlighted the core reform programs as a mechanism for managing national capacity system and resourcing arrangements.

Acknowledging that coordination at government level can be difficult, he commented that when policy, resources and relations with external sources of finance for climate change adaptation are consistent with aid effectiveness at the sectoral level, the priorities and relevant actions could take precedence. He supported the NAPA as a comprehensive cross-sectoral plan that can be used to start identifying actions and resources needed, as well as defining responsibilities at all levels and the role of civil society. Consistency with the core national reform is needed so that resources can be leveraged and a consistent approach can be ensured across the public sector at the sub-national level.

Mr. Chhieng called for more information sharing and coordination because of the multi-sectoral nature of climate change and the fact that it is unfamiliar to many stakeholders. He highlighted the need for external resource mobilization and support for priority actions, but cautioned that this should not overwhelm the capacity of the Government. Where resources need to be strengthened, he argued, this should complement the national approach and avoid fragmentation of support that might result in the shifting of resources from core activities. He acknowledged and welcomed the development partners' commitment to a coordinated and coherent approach. While the aid environment in Cambodia is highly complex, he urged the conference

to draw on experiences of sectors such as health, which has coordinated and managed the arrival of new funds such as the Global Fund.

As more funding opportunities become available, it will be necessary to manage the enthusiastic response and acknowledge the challenges that multiple funding sources could bring to Cambodia, which has constrained capacity. With strong optimism for applying aid effectiveness arrangements to climate change adaptation, Mr. Chhieng advised that careful selection of funding sources could offer robust and effective approaches to ensuring that the climate change agenda is well managed and resourced. Where developing capacity presents challenges, climate change activities should be integrated in the core reform agenda to ensure that development partners provide the necessary support. While lessons can be learned from other sectors and other countries, he warned there are challenges in coordinating multi-sectoral funds within the Government and in ensuring external support. In closing, Mr. Chhieng expressed his confidence that the National Climate Change Committee is well prepared to meet the challenges, and offered his full support for meeting those challenges.

## Panel Discussion and Q&A

**Mr. Karl-Anders Larsson:** From the perspective of development partners, Mr. Larsson argued that not only development partners and the Government but also civil society should be included in the aid effectiveness framework. He acknowledged the donors' role in providing finance, but said estimates of the amount of aid needed kept going up. Of the current estimated US$100 billion, about 60 percent linked in some way to climate change. Donors' first two objectives were to achieve the commitment of 0.7 percent of GDP to Official Development Assistance (ODA) and apply aid effectiveness principles to this aid.

Mr. Larsson agreed that there are challenges along with opportunities to learn and said he hopes the fragmented approach will not be repeated with climate change. He said ODA alone will not be enough and additional funding is needed, including funds from the private sector such as insurance schemes, and carbon trading. He also agreed that climate change should be integrated into existing programmes of support such as in infrastructure, agriculture, education, and health. Additional funds or institutions might be needed but they will have to be integrated into the country structure.

Referring to the recent OECD's report *Integrating Climate Change into Development Cooperation*, he noted some conclusions for donors on mainstreaming climate change into all existing support programmes. The major emphasis is on local level capacity development, but for Cambodia it must link closely with decentralization and deconcentration to target the local level. Thus it is crucial to work with civil society. To avoid creating a parallel structure, he recommended using existing structures and institutions as far as possible. He also stressed the need for close coordination between climate change adaptation and disaster risk management. While acknowledging their differences and substantial overlap, he said he will recommend it for future support by Sida.

**H.E. Mr. Chhieng Yanara:** Mr. Chhieng said there would be opportunities for more funding to be made available for Cambodia to respond to climate change. Cambodia had to mobilize, advocate for and encourage the use of existing national systems rather than create a new one specifically for climate change. Some partners might support the idea but others might be reconsidering now whether the existing structures can be used or a new one is needed. He said he is in favour of using existing structures as far as possible. If it is necessary, this could be put in the Government's position document for the Copenhagen conference in December.

## Roundtable 1: Biodiversity and Climate Change

**Chair Person:** H.E. Mr. Chay Samith, Delegate of the Royal Government of Cambodia in charge of the Administration for Nature Conservation and Protection, Ministry of Environment

Referring to the Intergovernmental Panel on Climate Change, Mr. Chay noted that the global temperature might have increased by an average of 0.76°C, with sea level rise of 12-22cm in the last century. It is projected that by 2100, the temperature might increase by 1.4-5°C

and this will affect ecosystems and biodiversity either directly or indirectly. As a result, he said, the number of species under threat will increase substantially.

Biodiversity is understood as diversity of life on earth, and includes all species of animals, plants, micro-organisms and genetic materials and the ecosystems. Climate change is long-term change caused by nature itself or by external forces, specifically human activities in the atmosphere or on earth. Adaptation is the adapting of humans to the system to reduce threats, and it can be spontaneous or planned. It can provide direct results to respond to the damage caused by climate change.

Climate change affects biodiversity through creating a need to adapt through changes in habitats, organisms' life cycles, and the earth's biophysical characteristics. But biodiversity also plays a role in mitigation, including sequestering carbon: 20 percent of emissions are said to come from loss of forest cover. Climate change affects agricultural production, human health, coastal areas, infrastructure, ecosystems, and so on. The linkages between climate change and biodiversity are thus the focus of the forum and particularly this roundtable.

Mr. Chay called for a focus on identifying and conserving biodiversity components that are most vulnerable, preserving habits for biodiversity, creating relevant awareness, and mainstreaming biodiversity in the National Adaptation Plan of Action.

## Climate Change and Biodiversity

*By Dr. Robert Mather, Head of Country Group: Lao, Cambodia and Vietnam, International Union for Conservation of Nature*

Dr. Mather's presentation emphasized the inseparable links between biodiversity on one hand and economic and human development on the other. He listed the natural systems that are most vulnerable to the projected climate changes, discussed the specific effects that climate change will have on coastal ecosystems, gave some examples of actions that can be taken to reduce these impacts, and outlined the approach of Mangroves for the Future.

His key messages were that climate change is already affecting coastal zones and large deltas and the human communities that depend on them. Risks will increase over coming decades, and the impact of climate change is exacerbated by increasing human-induced pressures. Adaptation will be more challenging for the coastal areas of developing countries than for the coasts of developed countries due to the constraints on adaptive capacity. The costs of adapting are much less than the costs of inaction, and present-day human development patterns and trends are frequently in conflict with unavoidable sea level rise, even in the longer term.

Dr. Mather said Cambodia's main ecologically sensitive regions include the Cardamoms, the eastern and northern plains, and the central flood plain where many endemic, endangered and vulnerable species reside. Current climate models are yet to agree on how quickly the impacts will occur, but the general trend shows that the climate is getting hotter, with more severe droughts and also wetter rainy seasons. As temperatures increase, the tropical climate zone will spread into higher latitudes and altitudes.

While some species are already at their limit for adapting to drought, many will move to new locations with favourable climate where habitats are still available. With higher temperatures, forest fires will be longer, more frequent and more intense, and there will be a shift in forest habitats in the country. More droughts mean that only species that can resist the new conditions will persist, while others will lose out. Such trends may occur not only for the tree species but also for biodiversity in general.

Referring to the recent estimates of about 3,000 species currently moving towards extinction; Dr. Mather said that 300 species are vulnerable in the Indo-Malayan realm, many of them in Cambodia. The most vulnerable ecosystems, he said, are arid lands, ecosystems occupying high latitudes, high altitude locations, the cryosphere (the polar ice caps), glacial fed regions, wetlands and freshwater ecosystems, low-lying coastal areas, coral reefs, and large deltas.

For Cambodia, aquatic biodiversity is more significant because of its importance to the country's economy and food security. While many species, including the Mekong Dolphin, are already under significant pressure, he stressed that they will be even more vulnerable

under climate change. With a 2°C increase in temperatures, he asked how the water surface, fish biology, and aquatic chemistry will change, as there will be more intense rain during a shorter and later wet season. With more intense rain, the erosive force will be stronger, and more erosion and more sedimentation will occur as a result. While primary productivity may be higher, resulting in more fish, too much sediment may cause fishes' gills to become clogged. Habitats will become more homogeneous and deep pools will be filled up. Many fish species in the Mekong migrate to Lao or China to spawn, so new water infrastructure such as dams may act as barriers preventing them from arriving at their spawning grounds, thus adding even more impact than climate change itself.

Sea level rise will make coastal areas and deltas more vulnerable. While more is known about regional or global averages, Dr. Mather emphasized that absolute data for each area are more relevant, as sea levels might rise faster in some places than the others. Increasing water temperature causes coral bleaching, more dissolved carbon dioxide increases acidity and reduces coral accretion. Changes in temperature, UV radiation, salinity, sea level and storm activity will affect seagrass distribution. Sea level rise will displace plant and animal communities inland, where estuarine communities might persist if migration is not restricted and changed hydrological cycles will alter freshwater and nutrient input to estuaries, leading to eutrophication (the accumulation of excessive nutrients in a river or lake, usually caused by from runoff from land of nutrients such as animal waste and fertilizers). Sea level rise and an increase in storms will exacerbate beach erosion. While increased temperatures and carbon dioxide levels might enhance the growth of mangroves, increased storm intensity and salinity intrusion might have negative impacts. In some places, growth might keep pace with or exceed sea level rise, especially if sediment arriving at the shoreline is not blocked by upstream dams, and groundwater is managed appropriately. In other places mangrove shorelines are subsiding and thus experiencing more rapid relative sea level rise.

Dr. Mather introduced Mangroves for the Future, a project launched in 2006 in areas affected by the Indian Ocean tsunami. The project is now being implemented with a common vision for "a more healthy, prosperous and secure future for all coastal populations in Indian Ocean countries, where ecosystems are conserved and managed sustainably". India, Indonesia, Maldives, Seychelles, Sri Lanka, and Thailand are the focal countries, while Bangladesh, Kenya, Malaysia, Pakistan, Tanzania, and Vietnam are dialogue countries. Support was also offered to Myanmar after Cyclone Nargis.

Using Climate Change Adaptation Planning, Mangroves for the Future first sets the context by defining the current and future climate. Next, climate change impacts are identified, adaptation options are selected and the resources needed are determined. Dr. Mather emphasized that Mangroves for the Future is "policy relevant" – it supports national legal and policy frameworks that are conducive for adaptation to climate change. It is "people centered" – it assists coastal populations to identify and implement adaptation options. And it is "partnership based" – it works in close collaboration with all interested partners to help them to meet their needs and to maximize the impacts of the project interventions.

## Q&A Session

**Mr. Tim Boyle:** Mr. Boyle contended that the concept of north-south corridors for groups of species to move to adapt to climate change would not be realistic given the environmental variables, the physical and other barriers such as the soil types, and the rate of change, which may not correspond with the rate of migration.

**Dr. Robert Mather:** Dr. Mather expressed his support for the point and said there is not enough knowledge to confirm it, because nature has never before disturbed by humans at such a rapid pace.

**Ms. Mak Soleang:** Ms. Mak referred to her review of a paper by ACEM on hydrological and ecological function of the Mekong river, the Lower Mekong in particular, and its biodiversity, and reflected on the impacts of climate change as presented by Dr. Rizaldi Boer on rainfall and the hydrological regime as a whole. She asked if any thought has been given to the hydrological and ecological services supporting the biodiversity and human society, and how they may change. In particular, she asked how the system will respond to extreme rain and dry.

**Dr. Robert Mather:** Dr. Mather said that with climate change there will be more rain and probably more runoff, and probably a shorter rainy season. Many species in the river are migratory, Dr. Mather said, and what triggers the start of migration is not known, but for many species the trigger is related to changes in flow, or in the velocity of the water, or in the turbidity (muddiness) of the water. With climate change, he suggested that the timing of fish migration might also change. But he said that as the species reach the end of their migrations, whether they will find the right conditions for spawning, feeding, and nursing juveniles is not known. He reaffirmed that no full or detailed understanding is available regarding whether some species will lose out due to the change or just be able to adapt and shift migration to one or two weeks later.

He also suggested that more water with more silt will create another impact due to the greater erosive force from more intense rainfall, which might influence primary production. The overall impacts on the hydrology of the river system, and of the Tonle Sap in particular, and the changes in dry season or wet season level will have significant implications, but we do not have detailed knowledge of these issues at the moment.

**Mr. Tim Boyle:** Mr. Boyle contended further that for forest biodiversity, REDD is a silver bullet, as it is the answer to forest biodiversity conservation. As well, managing the forest to optimize carbon stock is the way to optimize biodiversity conservation.

# Roundtable 2: Gender and Communications, Education, and Advocacy

**Chairpersons:** HE. Hak Seng Ly, Under Secretary of State, Ministry of Education, Youth and Sports, NCCC member

## Climate Change, Gender and Poverty

*By Mr. Brian Lund, Regional Director,*
*East Asia Regional Office, Oxfam America*

Mr. Lund argued that climate change will hit women harder because it will affect agriculture, which is critically important to poor people, and because women are the key producers in the poor, agricultural communities that will feel its impact most. More than 70 percent of the world's poor people rely on farming, and developing countries have more farmers than developed countries. There are about 3 billion farmers in developing countries, and 900 million of them are living in absolute poverty. In Cambodia, agriculture is the backbone of the economy and the main source of jobs for 73 percent of the workforce.

Climate change will affect agricultural communities through higher temperatures, lower and more erratic rainfall, heavier rain and more flash floods, loss of vegetation and increased hurricanes and disastrous storms. In poor rural communities, women produce much of the family's food and are more exposed to natural disasters. Often they are working on marginal lands without irrigation, and using saved seeds. They have no formal training and limited access to extension services and credit. Women are also more exposed and vulnerable to natural disasters. Oxfam figures from India, Indonesia and Sri Lanka suggested that more women than men were killed by the 2004 tsunami, with the disaster claiming four times as many women in some regions.

Turning to women and agriculture in Cambodia, Mr. Lund said nearly 80 percent of farm workers are primarily engaged in subsistence agriculture. Women make up 56 percent of the primary workforce in subsistence farming and 54 percent of the workforce in market-oriented farming. Most of these women are unpaid family workers. There are very few agricultural extension services and women have much less access to what little there is. Women provide firewood and household water, spending twice as much time collecting water during the dry season as they do during the rainy season. Women also make significant contributions to food security by collecting wild resources such as shellfish, snails and weeds to exchange for rice. Young girls do a lot of this work, taking them away from school. Women are also care givers, looking after their children and sick family members – all without payment and at the expense of their own health. Statistics from 2000 showed that 71 percent of women and 50 percent of men in Cambodia are functionally illiterate.

Climate change will result in more poverty and more exclusion for Cambodian women. They will spend

more time collecting water and wild foods. This will affect their already poor health and take time away from income generating activities, limiting their capacities, abilities, aspirations and freedom to enjoy their rights. The answer is additional international funding of at least US$50 billion a year, provided by the rich countries that are both most responsible and most capable of providing funds. Countries like Cambodia need pro-poor national adaptation plans with a gender focus.

What is happening on the road to Copenhagen? Mr Lund asked. Nine months ago there was no gender language in the negotiating texts. In Bangkok, 23 paragraphs on women and gender equality and equity were included in the text for the Ad-hoc Working Group on Long-term Cooperative Action. Gender and women's organizations are working to make sure that gender stays in the final agreement.

Beyond this, women's expertise, experiences, needs and capacities must be part of any climate change discussion and solutions. Gender equality must be integrated into discussions and all national adaptation plans. Women's participation needs to be welcomed at all levels, women's skills and knowledge on related issues need to be identified, and gender analyses need to be used for vulnerability assessments. The different ways that women use, access and control natural resources need to be understood, and gender equality needs to be targeted as part of social and economic conditions.

## Regional Climate Change Adaptation Knowledge Platform for Asia

*By Ms. Serena Fortuna, Associate Programme Officer, UNEP*

Ms. Fortuna gave an overview of the Regional Climate Change Adaptation Knowledge Platform for Asia. The project is supported by Sida and the initial partners are the Stockholm Environment Institute, the Swedish Environment Secretariat for Asia (SENSA), UNEP, and the Asian Institute of Technology / UNEP Regional Resource Centre for Asia and the Pacific, which also hosts the Adaptation Knowledge Platform Secretariat.

The platform helps countries adapt to the challenges of climate change and builds bridges between knowledge on climate change adaptation and the people and organizations that need it. It supports information sharing, policy making and capacity building, and brings together researchers, practitioners, policy makers and business leaders working on adaptation. The platform's goal is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national and regional levels. It aims to establish a regionally and nationally owned information exchange mechanism and facilitate the integration of climate change adaptation into national and regional economic and development policies, processes and plans. It also aims to strengthen linkages with the development agenda and enhance research and institutional capacity. Its specific objectives are to generate new knowledge, apply existing and new knowledge, and establish a system for sharing regional knowledge.

The platform's geographic scope during Phase 1 (2009-2011) is the Greater Mekong Sub-Region (Cambodia, China, Lao PDR, Myanmar, Thailand and Vietnam) and other Asian countries including Bangladesh, Bhutan, Indonesia, Malaysia, Nepal, the Philippines and Sri Lanka. It envisages four main national level activities during Phase 1. It is conducting country knowledge mapping exercises of users and providers. It links and supports existing or emerging national knowledge platforms through institutional mechanisms for integrating adaptation into national processes and plans. It helps with the identification of research priorities through the perspective of knowledge users. And it supports the development of adaptive capacity for each country by building on national capacity self-assessments.

## Climate Change and Human Development: National Human Development Report 2010

*By Mr. Lay Khim, Head of Environment and Energy Unit, UNDP Cambodia*

Mr. Lay's presentation defined the concept of "human development", explained how climate change affects human development and outlined the challenges for Cambodia. He described the purpose and scope of the *Cambodia National Human Development Report 2010* on climate change, whose aim is to promote public and decision makers' awareness on

the issue by making climate change relevant to Cambodia.

Mr. Lay said global *Human Development Reports* have been published since 1990 to provide a reliable source of information and an alternative perspective on critical issues of human development worldwide. The Human Development Index (HDI) is a composite measure with three dimensions: living a long and healthy life (life expectancy), being educated (adult literacy, school enrolment), and having a decent standard of living (purchasing power parity, income). The HDI focuses on people rather than economic development, which measures physical goods and services such as GDP. According to the latest global *Human Development Report*, Cambodia ranked 137 out of 182 on the HDI, compared with 143 on GDP.

The five main potential impacts of climate change are damage to agricultural productivity, heightened water insecurity, increased exposure to extreme weather events, collapse of ecosystems, and increased health risks. The effects are cumulative, irreversible and global. There is an inverse relationship between vulnerability and responsibility – the poorest people and countries are affected the earliest and most. In Cambodia, natural disasters are already major contributors to poverty and climate change will make these worse. In the short term, floods and droughts will be more frequent and unpredictable, and in the long term there will be changes in the Mekong flood pulse system. Crop production and fisheries will suffer as a result and more fever and diarrhea are expected. If sea levels rise by 1m, 56 percent of Koh Kong City could be submerged. Climate change refugees can also be expected.

*National Human Development Reports* (NHDR) have been produced since 1992 in more than 140 countries, resulting in 628 reports as of April 2009. The reports are tools for in-depth and independent policy analysis and advocacy which reflect people's priorities while strengthening national capacities. The NHDR is best understood as an on-going capacity development and advocacy process in which the published report itself represents only one important output. Six NHDR have been developed in Cambodia between 1998 and 2007, on topics including women's contribution to development, children and employment, and rural livelihoods.

M Lay said the *Cambodia Human Development Report 2010* will focus on climate change because there is still a major knowledge gap as to what it means to Cambodia, and what actions Cambodia should take in adapting to climate change or benefiting from various opportunities. It will make climate change relevant to Cambodia by demonstrating threats and opportunities in concrete terms as much as possible, demystifying the links between environment and development, facilitating policy dialogue, and promoting coordination and capacity development. It will focus on the impacts on rural livelihoods and rural sectors, and on highlighting opportunities and win/win scenarios rather than threats. It will analyse Cambodia's vulnerability from a human development perspective, and look at implications for rural livelihoods and at economic effects on various sectors. As well, it will examine opportunities to turn climate change into leverage for economic growth and sustainable development and at concrete information on how the adaptation actions and mitigation options can be financed or where technical references can be found. It will link with and add value to existing studies. A Senior Advisory Group is providing technical inputs and various government ministries and institutions are participating in the development process.

## Q&A Session

Questions asked in the session include 1) What will the coordination mechanism on climate change at national level be for the Climate Change Adaption Knowledge Platform? 2) Is climate change mainstreamed among the 37 countries' claimed MDGs achievements? 3) Why does the Ministry of Agriculture, Forestry and Fisheries have no representation in the Senior Advisory Group to draft National Report on Human Development and Environment?

Answering the first question, Ms. Fortuna explained that the knowledge platform initiative will focus on gathering knowledge and information to be shared

among interested stakeholders for better informed communications on related issues to climate change and adaptation. The initiative will be built on existing knowledge and information related to climate change in the country by working with existing local partners.

Mr. Lay also responded that none of the 37 countries have included climate change in their MDGs indicators. As for MAFF's participation in a Senior Advisory Group to draft national Report, he said no response to a request for its participation was received.

# Plenary Discussion: The Road Towards Copenhagen

## Overview of CoP-15: Key Elements

*By Mr. Mozaharul Alam, Regional Climate Change Coordinator, Regional Office for Asia and the Pacific, UNEP*

Mr. Alam's presentation gave an overview of the preparations and negotiations being held in the lead-up to the UNFCCC's 15th Conference of Parties (CoP-15) meeting due to be held in Copenhagen in December. Mr. Alam cautioned that the CoP-15 talks would be complex and intense. He summarized the key issues and discussion streams, the institutional structure, and the state of play on the Bali Action Plan, which comprises a shared vision on long-term cooperative action, plus enhanced action on four elements: mitigation; adaptation; finance and investment; and technology transfer and capacity building.

The Conference of Parties negotiations are managed through a complex institutional structure including the Subsidiary Body for Scientific and Technical Advice (SBSTA) and the Subsidiary Body for Implementation (SBI), which both provide policy guidance. Under the SBSTA there is an Expert Group on Technological Transfer and a Joint Working Group with links to the Intergovernment Panel on Climate Change. Under the SBI there is an Expert Group on Least Developed Countries and a Consultative Group of Experts representing Non-Annex 1 countries. A financial mechanism brings together 10 implementing agencies with a focus on long-term cooperative actions. The mitigation discussion stream, which focuses on reduction of greenhouse gas emissions, has two Ad-Hoc Working Groups (AWGs). These are the Ad-hoc Working Group on the Kyoto Protocol (AWG-KP) and the Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA). The AWG-KP focuses on emission reductions required by Annex 1 Parties (developed countries) under the Kyoto Protocol (up to 2012) and in the period beyond 2012 after the protocol expires. The AWG-LCA focuses on three elements. The first is measurable, reportable and verifiable nationally appropriate mitigation commitments by developed countries. The second is appropriate mitigation actions by developing countries. The third is policy approaches and incentives relating to Reducing Emissions from Deforestation and Forest Degradation in developing countries, known as REDD and REDD+.

Mr. Alam said the focus of the current discussions is the Bali Action Plan for full, effective and sustained implementation of the UNFCCC – now, and up to and beyond 2012. The Bangkok Climate Change Talks of the two Ad-hoc Working Groups held in Bangkok in September-October 2009 continued the efforts to consolidate and streamline the negotiating text. The Least Developed Countries (LDCs) and the Small Island Developing States (SIDS) are asking for a more ambitious long-term reduction target, such as an 85 percent cut by 2050. The EU is open to an 80-95 percent cut and the US is more inclined to 50 percent, and no agreement has been reached.

The shared vision on long-term cooperative action comprises three key elements: the nature of the shared vision, a long-term global goal, and a review of the shared vision. Discussions currently focus on the new "non-paper" (paper 33) by the Chair of the AWG-LCA.

Enhanced action on adaptation and its means of verification has six sub-sections: objectives, scope and guiding principles; implementation of adaptation action; means of implementation; risk reduction and

risk management, including strategies such as sharing and transfer (insurance); institutional arrangements; and monitoring and review.

Enhanced action on mitigation and the second commitment period envisages setting a long-term goal for emission reductions. This includes Nationally Appropriate Mitigation Actions (NAMA) for developing countries supported by finance and technology, and commitments by developed countries, on which no significant progress has been made.

Enhanced action on finance involves several key issues. At present, there is insufficient finance to address the financial flows that are estimated to be needed in future. For adaptation, 0.3-0.5 percent of global domestic product and 1.1-1.7 percent of global investment will be required to address climate change in 2030. For mitigation, additional investment and financial flows of US$200-210 billion will be required to reduce carbon dioxide equivalent emissions by 25 percent below 2000 levels in 2030.

Enhanced action on technology development and transfer involves, among other things, ways to remove obstacles to technology transfer, ways to accelerate deployment, diffusion and transfer of affordable environmentally sound technologies, and cooperation on research and development of current, new and innovative technologies. Key issues include intellectual property rights, incentive mechanisms, and institutional arrangements. Enhanced action on capacity building involves principles, and the scope, institutional arrangements, measurement and financial resources for capacity building support.

# Draft Position for Cambodia

*By H.E. Dr. Sat Samy, Secretary of State, Ministry of Industry, Mines and Energy, Vice Chairman of NCCC*

The National Committee on Climate Change has produced a draft position document for negotiation at the Copenhagen Conference of the Parties to the UNFCCC (CoP-15) covering issues on adaption to climate change, mitigation of climate change and technology transfer. The full text of the draft document is in Appendix 3.

# Signing "Seal the Deal"

Dr. Mok Mareth invited delegates to sign the UN-led "Seal the Deal" petition calling on all countries to agree on 2°C target climate change at the Copenhagen negotiations.

# Closing Session

### Closing Remarks by Mr. Qimiao Fan, Country Manager, World Bank

Mr. Fan began his remarks by noting that climate change is an urgent and common issue in every country and for people all over the world, particularly least developed countries such as Cambodia. He said the issues are how to cope with the impact of this changing environment on food, water, energy, health, and how to support the development of sustainable livelihoods. He suggested that Cambodia's challenge is to adapt to and alleviate the inevitable impacts of climate change, and that without this the achievement of the CMDGs will be at risk.

Mr. Fan also echoed the remarks of the Prime Minister when he said that regardless of the efforts Cambodia has made, success can only be achieved if developed countries fully play their part. He further urged that countries seek not just climate resilient development but also climate smart development. He referred to the World Bank World Development Report on Development and Climate Change, which calls for developed countries to immediately make significant emission reductions and to transfer technology and knowledge to developing countries for adapting to and mitigating climate change. He explained that by doing climate smart development, least developed countries will also have to focus on poverty reduction.

He praised the leading role taken by Cambodia among developing countries in completing and implementing the National Adaptation Programme of Action and establishing the National Committee on Climate Change. He said the implementation of the Pilot Programme for Climate Resilience will bring multilateral banks, UN agencies and bilateral agencies into the government-led program to pilot the integration of climate impacts and adaptation into national development planning. In closing, he called on all countries to act now, act together and act differently.

### Closing Remarks by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

H.E. Dr. Mok said that, regardless of the difficult time over the last 10 years with a lot of changes at stake, Cambodia has achieved remarkable results in the area of climate change. He appreciated the contribution made in the forum to meeting some urgent priorities such as institutional strengthening; preparation legislation, policies, and plans to respond to climate change; mobilization and management of resources; coordination and cooperation; research and development; and preparation for negotiations at CoP-15.

Dr. Mok warned of the risk to humankind if no changes to current development patterns are realized and stressed the need for low-carbon or carbon-neutral development. He stressed that Cambodia has not been a contributor to climate change and will not be one in the near future. He highlighted the country's decision to be a part of the solution in turning the climate change crisis into a new opportunity for a sustainable development.

Highlighting the commitment of the NCCC to ensuring cooperation, coordination and partnership responsibility in an equitable, transparent, efficient and credible manner, Dr. Mok acknowledged the need for assistance to build the legal and policy framework, the technical and institutional capacity, credible financial and management systems, the transfer of technology and know-how, and the participation of all stakeholders. In closing, he expressed his gratitude to all those who had participated in the successful forum. He also thanked the donors for their generous support, with a promise to host another forum next year.

## Press Conference

A press conference was held to share key results of the First National Forum on Climate Change with national and international media. Speakers were from the Royal Government of Cambodia (Ministry of Environment/National Committee on Climate Change) the EU, Oxfam America, Sida, and UNDP. H.E. Dr. Mok Mareth, Chairman of the National Committee on Climate Change, chaired the session and welcomed all participants and speakers. He declared the event successful in meeting its objectives with support from the Government on key discussions, including a government position on climate change for the Copenhagen event in December 2009, and sharing knowledge and information on climate change in Cambodia. Participation in the event by all participants was impressive, he added.

Speakers said they were impressed by the Government's commitment and ownership on climate change. They had pledged to work closely with the Government on programmes and projects related to climate change. Gender had been raised and discussed in relation to climate change. When asked if the Government would take technical assistance with conditions on climate change program, Dr. Mok said that a simple answer was that responses to climate change should receive unconditional support. It should be seen as an issue requiring additional assistance, not a shift of existing development assistance from other issues to climate change.

# ANNEXES

## APPENDIX 1. Agenda

**Day 1** **Monday 19 October 2009**

**Opening Ceremony**

**Venue: Chaktomouk Theatre**

**14.30 – 15.00**

- Arrival of participants
- Arrival of distinguished national and international guests

**15.30**

- Arrival of **Samdech Akka Moha Sena Padei Techo HUN SEN**, **Prime Minister of the Kingdom of Cambodia**

**Commencement of the Opening Ceremony**

- Announcement of the Agenda for the Opening Ceremony
- National Anthem of the Kingdom of Cambodia
- Welcome Remarks by **H.E. Dr. Mok Mareth**, Senior Minister and Minister of Environment, NCCC Chair
- Opening Speech by **Samdech Akka Moha Sena Padei Techo HUN SEN, Prime Minister of the Kingdom of Cambodia**
- Departure of **Samdech Akka Moha Sena Padei Techo HUN SEN, Prime Minister of the Kingdom of Cambodia**, and distinguished guests
- Closing of the Opening Ceremony of the First National Forum on Climate Change

**Day 2** **Tuesday, 20 October 2009**

**7.30 – 8.30** **Registration**

**Venue: InterContinental Hotel**

**8.30 – 8.50** **Opening Session**

Master of Ceremonies

**H.E. Sem Saroeun**, Director General, Ministry of Environment

- Welcome Remarks by Mr. Douglas Broderick, UN Resident Coordinator
- Welcome Remarks by Mr. Rafael Dochao Moreno, Chargé d'Affaires, Delegation of the European Commission
- Welcome Remarks by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

**8.50 – 9.00** **Overview of the Day**

**9.00 – 10.00**

- **Introduction – Science, Impacts, Opportunities and the UNFCCC** by Mr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP
- **Global Perspective on Climate Change: Development and Climate Change** by Mr. Ian Noble, Lead Climate Specialist, World Bank
- **The Economics of Climate Change in Southeast Asia: A Regional Review** by Mr. Juzhong Zhuang, Assistant Chief Economist, Economics and Research Department, Asian Development Bank

**10.00 – 10.15** **Coffee Break**

**10.15 – 12.30** **Working Session 1: Climate Change Mitigation – Challenges, Successes and Lessons Learned**

**Co-Chairpersons**

- H.E. Dr. Sat Samy, Secretary of State, Ministry of Industry, Mines and Energy, Vice Chairman of NCCC
- Mr. Timothy James Boyle, Regional Technical Specialist, REDD, UNDP Regional Centre, Thailand

**Presentations:** **(5x15-20 min)**

1. **The Kyoto Protocol, CDM and Voluntary Markets** by Bridget McIntosh, Managing Director, CarbonBridge
2. **Forestry and REDD: Background and Cambodian Experience** by Dr. Keo Omaliss, Deputy Director of Department of Wildlife and Biodiversity, REDD Focal Point, and Mr. Chheng Kimsun, Deputy Director General, Forestry Administration

3. **Prospects and Challenges in REDD Implementation: Vietnam's Experience toward REDD Readiness and Country Initiatives** by Dr. Pham Manh Cuong, National Technical Advisor of the UN-REDD Programme, Department of Forestry, Ministry of Agriculture and Rural Development, Vietnam
4. **Renewable Energy Development in Cambodia** by Mr. Toch Sovanna, Director of the Department of Energy Technique of the Ministry of Industry, Mines and Energy
5. **GHG Mitigation by Low Cost Technology** by Mr. Iwan Baskoro, Country Director, GERES

**Panelists:** Co-chairs, Mr. Jossy Thomas, Industrial Officer for Renewable Energy, UNIDO; Mr. Jacob K. Jepsen, Counsellor, Royal Danish Embassy – Danida; Mr. Adisorn Chieu, Managing Director, Angkor BioCogen; Oknha Khaou Phallaboth, President, Khaou Chuly Group

**Q&A**

**12.30 – 14.00** **Lunch at InterContinental Hotel**

**14.00 – 16.00** **Working Session 2: Climate Change Adaptation – Challenges, Successes and Lessons Learned**

**Co-Chairpersons**

- H.E. Lim Sokun, Secretary of State, Ministry of Agriculture, Forestry and Fisheries, NCCC Vice Chair
- Ms. Anja-Christina Beier, Sida's helpdesk for Environmental Assessment/ Swedish EIA Centre, Swedish University of Agricultural Sciences

**Presentations:** **(4x15-20min)**

1. **Climate Projection and Impacts, and Vulnerability and Adaptation (V&A) in Agriculture and Water Resources** by Dr. Rizaldi Boer, Vulnerability and Adaptation Advisor; and Mr. Heng Chanthoeun, V&A Team Leader, UNDP/GEF SNC Project
2. **Climate Change Impacts on Health** by Prof Dr Anthony J. McMichael, Expert, Climate Change and Health Project in Cambodia, WHO
3. **Climate Change Vulnerability and Adaptation in the Fisheries Sector** by Mr. Edward H. Allison, Climate Change Director, The WorldFish Centre
4. **Financing Adaptation** by Mr. Bert Maerten, Climate Change Campaign Leader, Oxfam International

**Panelists:** Co-chairpersons; Mr. Ian Noble, Lead Climate Specialist, World Bank; Mr. Aminul Islam, Assistant Country Director, Head Environment and Disaster Management Unit, UNDP Bangladesh; Mr. Im Sophanna, Vice Chief of Weather Monitoring Office, Ministry of Water Resources and Meteorology

**Q&A**

**16.00 – 16.15** **Coffee Break**

**16.15 – 16.30** **Summary of the Day and Closing**
By Mr. Ken Serey Rotha

**18.30 – 20.30** **Cocktail Reception & presentation of a video documentary on climate change**
**Venue: Imperial I, 3rd Floor, InterContinental Hotel**

## Day 3: Wednesday, 21 October 2009

**7.30 – 8.30** **Registration**
**Venue: InterContinental Hotel**

**8.30 – 8.45** **Opening Session**
Master of Ceremonies
Mr. Ken Serey Rotha

- **Welcome Remarks** Mr. Jo Scheuer, Country Director, UNDP Cambodia
- **Welcome Remarks** H.E. Mr. Lim Kean Hor, Minister of Water Resources and Meteorology, Ministry of Water Resources and Meteorology

**8.45 – 9.00** **Overview of the Day**

**9.00 – 10.45** **Working Session 3: Towards a Low-Carbon Society**

**Co-Chairpersons**
- H.E. Srun Dara, Under-Secretary of State, Ministry of Economy and Finance, NCCC member
- Mr. Ajay Markanday, FAO Representative

**Presenters:**

1. **Toward a Low-Carbon Society** by Mr. Masakazu Ichimura, Chief, Environment and Development Policy Section, Environment and Sustainable Development Division, UNESCAP
2. **Climate Policy and Renewable Energies in the EU and Germany: Lessons Learned and Further Development** by Dr. Georg Maue, Nature Conservation and Nuclear Safety, Federal Ministry for the Environment, Germany

**Panelists:** Co-chairpersons; Mr. Jeroen Verschelling, Director, Kamworks; Mr. Koch Sovath, Deputy Director General, Ministry of Environment; Dr. Andrew Mears, Climate Change Advisor, UNDP Cambodia; Mr. Dominique Catry, Chairman, Comin Khmere

**Q&A**

**10.45 – 11.00** **Coffee Break**

**11.00 – 12.30** **Working Session 4: NSDP, Climate Change and Aid Effectiveness and Coordination**

**Co-Chairpersons**

- H.E. Ou Orhat, Secretary of State, Ministry of Planning
- H.E. Duy Thouv, Deputy Secretary General, Council for the Development of Cambodia (CDC), NCCC member from CDC, Deputy Secretary General of the Cambodian Investment Board (CIB)

**Presenters**

1. Mr. Poch Sovanndy, Deputy Director General, Ministry of Planning
2. H.E. Chhieng Yanara, Secretary General of Cambodian Rehabilitation and Development Board and Deputy Secretary General of the Council for the Development of Cambodia (CDC)

**Panelists:** Co-chairpersons, presenters; Jacob K. Jepsen, Counsellor, Royal Danish Embassy – DANIDA, Mr. Karl-Anders Larsson, Counsellor, Economist, Embassy of Sweden – Sida

**Q&A**

**12.30 – 14.00** **Lunch at InterContinental Hotel**

**14.00 – 15.30** **Roundtable 1: Biodiversity and Climate Change**

**Venue: Separate Room InterContinental Hotel**

**Chairperson:** H.E. Chay Samith, Delegate of the RGC in Charge of the Administration for Nature Conservation and Protection, Ministry of Environment

**Presenter:** Dr. Robert Mather, Head Country Group Laos, Cambodia & Vietnam, IUCN

**Roundtable 2:** **Gender and Communications, Education and Advocacy**

**Venue: Separate Room InterContinental Hotel**

**Chairperson:** H.E. Hak Seng Ly, Under-Secretary of State, Ministry of Education, Youth and Sports, NCCC Member

**Presenters**

1. **Climate Change, Gender and Poverty** by Mr. Brian Lund, Regional Director, East Asia Regional Office, Oxfam America
2. **Climate Change Knowledge Platform:** by Ms. Serena Fortuna, Associate Programme Officer, UNEP
3. **National Human Development Report** by Mr. Khim Lay, Assistant Country Director, Environment and Energy, UNDP Cambodia

**15.30 – 15.45** **Coffee Break**

**15.45 – 16.45** **The Road towards Copenhagen - Plenary Discussion**

**Co-Chairpersons**

- H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair
- H.E. Soth Sothun, Under-Secretary of State, Ministry of Foreign Affairs, NCCC Member

**Presenters**

1. **Overview of CoP-15** by Mr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP
2. **Draft Position for Cambodia** by H.E. Soth Sothun, Under-Secretary of State, Ministry of Foreign Affairs, NCCC member

**16.45 – 17.15**

- **Summary of Two-Day Proceedings** by Mr. Ken Serey Rotha
- **Presentation of the "Moonlight" Lantern** by Mr. Jeroen Verschelling, Director of Kamworks to H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair
- **Signing "Seal the Deal"** by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

**17.15 – 17.30** **Closing Session**

Master of Ceremony: Mr. Ken Serey Rotha

**Closing Remarks** by Mr. Qimiao Fan, Country Manager, World Bank

**Closing Remarks** by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

# APPENDIX 2. Opening and Closing Remarks

**Opening Remarks – Day I**
**by Samdech Akka Moha Sena Padei Techo Hun Sen,**
**Prime Minister of the Kingdom of Cambodia**

**Address at the First National Forum on Climate Change**
**Phnom Penh, 19 October, 2009**

**Venerable Monks,**
**Your Excellency Douglas Broderick, UN Resident Coordinator in Cambodia,**
**Excellencies, Ladies and Gentlemen,**
**Dear Participants and Students,**

Today, it is my privilege and pleasure to participate in Cambodia's **First National Forum on Climate Change**. I would like to extend a warm welcome to distinguished national and international representatives of the Senate, the National Assembly, government ministries and institutions, development partners, ambassadors to the Kingdom of Cambodia, NGOs, members of the private sector, representatives of educational institutions, and all the participants.

As we already know, during the 1992 summit of the world leaders in Rio de Janeiro on sustainable development and the 21st century agenda for guiding the world towards sustainable and equitable development, Cambodia was locked in the national reunification effort.

The 1993 Election, supported by the UN, gave birth to a coalition government but the civil war still existed. However, Cambodia managed to integrate itself into the international community and took part in addressing global issues.

In particular, Cambodia signed the United Nations Framework Convention on Climate Change in 1995, reflecting its awareness of the issue as well as its determination and responsibility in the global effort to tackle climate change.

It was not until 1998 that Cambodia enjoyed complete national peace and political stability for the first time in four decades, thanks to the Royal Government's **"Win-Win"** policy and political will as well as its determination in the cause of national unification. Currently, Cambodian people are striving to restore socio-economic development to improve living standards and ensure national sustainable development, as stated in the **Rectangular Strategy Phase II.** We are implementing the task under the theme of "Climate Change" which cannot be ignored in the national development agenda and international relations.

This factor not only requires us to reconsider our national development plan and traditional methods in development effort, but we must transform it into an opportunity for underpinning sustainable development in the face climate change.

In this spirit, the organization of the **First National Forum on Climate Change** is another crossroad in the history of Cambodia. This forum is a critical event and allows us to share information and experience with other regional countries. We can also exchange dialogue on critical issues and measures to tackle climate change and embed it in the formulation of national policies and plans, future implementation of various international agreements on climate change, financing for developing countries, transfer of technologies, emergency funding for the most vulnerable countries, especially adaptation measures and capacity building. I would like to take this opportunity to extend my profound gratitude to particular development partners and NGOs for supporting this important forum and taking part in tackling climate change.

**Excellencies, Ladies and Gentlemen!**

The three main challenges of climate change are: increasing temperature, changes in rain patterns, and changes of sea level which have direct and strong impact on least developed countries. As a country that has just recovered from civil war, and has made limited development progress, Cambodia is vulnerable to climate change, because Cambodia is an agricultural country with the majority of the population depending upon the agricultural products and other natural resources for their daily lives. As stated clearly in a Khmer proverb **"Farming requires water, fighting requires food supply",** this is important for our agriculture sector, our living and as well as the entire national development. **Rice** and **fish** are our staple foods, traditional and strategic. Within this context, the impacts caused by climate change on agriculture, water resources, fisheries and people health and others will lead to severe food security and socio-economic development problems, as we have limited resources technically, financially and institutionally to respond to climate change.

The Royal Government of Cambodia, as a signatory of the United Nations **Convention on Climate Change and the Kyoto Protocol,** is fully aware of the impact and will continue to do its best to implement this convention and protocol. In fact, in reducing the greenhouse effect we have implemented many **Win-Win** measures to support sustainable development, such as the Clean Project Mechanism, promotion of renewable energy, campaign on oil and energy saving, conservation of forest in national natural reserves and protected forest areas as well as voluntary activities of the private sector in the promotion of the use of renewable energy from agriculture wastes for their production, especially the use of bio-energy, rice husks and bio-gas for electricity production and cooking in rural areas.

In the forestry sector, we have implemented some projects by the Forestry Administration to reduce the greenhouse effects caused by the loss of forest, degradation of forest, preservation of forest as well as raising the living standards of the community within the projects, whether they are inside or outside the national natural resources protected areas.

As measures for adaptation to climate change measures, the Royal Government of Cambodia has implemented a programme of activities of adaptation of climate change in late 2006, which has 39 projects for implementation to respond to immediate needs of communities to adapt themselves to climate change.

In the agricultural sector, as I have already mentioned, because of climate change, it is necessary to change the practice that our farmers have been traditionally carrying out, basically from rice transplanting to the use of rice seeds. Otherwise, we would not be able to ensure food security and development.

The RGC is paying great attention to institutional capacity development. In 2006, we established the National Climate Change Committee, which is an institution with a comprehensive mission related to policy formulation, coordination, enhancement of corporation etc., particularly in climate change. Recently, I accepted the request

for chairing this international committee, which is a testimony of great attention of RGC on climate change because it is not only an environmental issue or separate sector, but a development issue that is inter-sectoral in relation to behavior and multi skills that involve duty of national ministries.

This national committee must primarily focus on mainstreaming of climate change into relevant sectors, especially agriculture; water resources; forestry; industry and energy and health. It is concerned with ensuring sustainable agricultural development; growth of rice production; food security; sustainable development of the industrial sector and energy; reduction of oil imports; the sustainable development of water resources and land; development of tourism; culture and nature; the people's health care and the construction of infrastructure that will endure the changes in the weather. At the same time, an important task is to strengthen the capacity of this Secretariat, which consists of professionals having work experience, technical ability and skilful management capacity from relevant ministries and institutions, aiming at ensuring the effective operation and sustainable work of this national committee. In this regard, I would like to call for increased support and facilitation from all development partners with this national committee, which is the RGC's official institution for policy framework, ensuring ownership and responding to the specific needs of Cambodia.

**Excellencies, Ladies and Gentlemen!**

Climate change is a great challenge facing the world that has strong potential to change the development of human civilization, if we do not take serious and timely measures to cope with it. This issue does not stop at the particular boundary of one nation because the world has only one atmosphere. Therefore, both rich and poor countries are affected by climate change. Unfortunately, poor countries are the ones that are mostly affected by a crisis that originated elsewhere, because they have very few resources to cope with climate change. Very often, governments of poor countries have very limited intervention through rescue operation and relief efforts after a crisis has already occurred. As for those poor people, they only have to endure the hardship from climate change. Indeed, those people have become accustomed to the loss of lives, properties, and crops every year, however, this adaptation can be considered as unsuccessful. This has created a moral issue for the world. Who is responsible for victims of climate change in Bangladesh's Delta region, or those millions of people living on small remote islands who will lose their homes from rising sea level? Actually, those developed countries who created the problem in the first place should show more remorse and be the first to accept responsibility for their past and current deeds, as stated in the United Nations Framework Convention on Climate Change. **This is a karma for enjoying happiness and prosperity over someone else' sorrow, especially, when it is done intentionally.**

In two months, world leaders will convene for the 15th time in **Copenhagen, Denmark** to seek solutions for climate change by discussing the creation of a new agreement after the end of the first phase of **Kyoto Protocol** in 2012. Although the implementation of the **Kyoto Protocol** has shown some limited achievements, politically this protocol revealed that all countries can help to reduce greenhouse gas emission and support sustainable development. In this sense, the principles as embedded in the **Kyoto Protocol** are still valuable for consideration in preparing the new agreement to tackle climate change. In general, Cambodia fully supports climate change resolution measures based on critical principles of the United Nations Framework Convention on Climate Change which includes **"joint responsibility, but to a different degree", "different requirements and unique situation of developing countries, especially countries vulnerable to climate change and their right to promote sustainable development"** and those preventive measures which allow them to take action even when science is unavailable.

Indeed, it will be difficult to expect a new agreement replacing the **Kyoto Protocol** at the end of this 15th Summit because there are many contrasting views on the matter. However, we hope that all countries will agree on some common points relating to the responsibility of each country in reducing greenhouse gas emission, assisting the adaptation measures for those countries vulnerable to climate change, financing, transferring technology and building capacity for developing countries, especially, for the Least Developed Countries.

LDCs are the most vulnerable to climate change because their adaptation capacity is still limited. Therefore, those countries should be the prime target for receiving assistance, especially for implementing their national sub-programmes for adaptation to climate change, and the financing of their adaptation projects should not be tied to any condition at all based on the real circumstances and needs of each community and country. Currently, there is a very small budget of about $300 million that can be used to finance adaptation activities in developing countries, compared to their annual requirement which is estimated to be billions of dollars. In this sense, there should be a legal commitment to financing adaptation activities for vulnerable countries to avoid adding extra debt to those countries. For instance, countries as listed in Annex 1 of the Convention on Climate Change should provide more financing to support the expenses of the adaptation activities in developing and vulnerable countries, which is the contract under Article 4 of the Convention.

It is very encouraging to know that recently the European Union has pledged and is considering providing a budget of US$2 to US$15 billion annually to poor countries for implementing their adaptation measures.

**Excellencies, Ladies and Gentlemen!**

Relating to the future agreement after the **Kyoto Protocol,** Cambodia fully supports the reduction of greenhouse gas emissions through avoiding forest degradation and destruction and promoting forest conservation, because the loss of tropical forest has contributed about 20 percent of gas emission annually around the world. However, the success of this mechanism could be assured only with a good incentive scheme, justice, and justified economic cost of legal versus illegal use of forest. In addition to carbon absorption, forest protection and conservation bring a lot of benefits to community, country and the world. They include non-timber forest products for communities, protecting watersheds, regulating water level, fertilizing land, absorbing rain water, correcting weather condition, conserving biodiversity, etc. Local communities should be the ultimate beneficiaries from this sort of project. However, allocation of resources to transform forest into carbon absorption reservoirs should not compete with efforts to promote the reduction of greenhouse gas emissions, which has been done by promoting renewable energy, energy efficiency, technology transfer to poor countries as well as the effort of developed countries to reduce emissions.

The effort of either reducing greenhouse gas emissions or adapting to climate change could not be a success without the transfer of modern technology to developing countries, especially to the least developed countries. This is well taken in Article IV of Climate Change Convention and Bali Roadmap.

This is a **win-win** solution for the world climate, because developing countries could bypass traditional methods of economic development, and instead they could increase efficiency, reduce environmental pollution and reduce greenhouse gas emissions to support sustainable socio-economic development. Nevertheless, market mechanisms have failed to encourage technology transfer, because it is driven by profit and does not have any mechanism to add environmental impacts. Moreover, new technologies that do less harm to environment are expensive and protected by global patents, which is a reason for their lower attractiveness to the private sector. In this regard measures based on supply-demand are not sufficient to drive technology transfer. To fill the gap, governments in the developed world should take more actions to ensure that climate-

friendly technology could be transferred to developing countries. In short, monitoring and market mechanisms are two complementary measures for technology transfer under the UN Framework Convention on Climate Change. However, they should not transfer technologies as an excuse to get rid of obsolete technologies that are harmful to humans or the climate, and they should not experiment with unreliable technologies, whose impacts are unpredictable. Technology transfer should be comprehensive by including specialized tools, information, capacity building and financial resources. In this regards, South-South cooperation should be added to North-South Cooperation to encourage technology transfer at low cost.

Climate change is a result of market failure. The open cycle of the market system is following: extract natural resources, produce, consume, emit back to the environment. The absence of mechanisms to include environmental impacts in the cost of production and the proliferation of consumerist culture worldwide leads to excessive extraction of natural resources, especially fossil fuel, and emissions of greenhouse gases at the highest level in human history. This life and-death challenge is a historic test for human being to show their capabilities to protect their lives and civilizations. In this regard, individuals, institutions and countries have their respective roles in addressing this life and death issue according to their abilities, competencies, roles, responsibilities and contributions to the causes of these issues.

In the context of Cambodia, the immediate priorities are the following: prepare policy, strategy and action plan on climate change; streamline climate change into sectoral policies and plans; create a climate change fund to mobilize resources for implementing projects on adaptation to climate change and reducing greenhouse gas emission; strengthen institutional and technical capacity, cooperation and coordination and research studies; strengthen the role of the private sector, and prepare to join the 15th summit of members of the Climate Change Convention.

With limited capacities and resources, but with high policy commitment, Cambodia is ready to contribute to and share responsibility for the future of human beings in the world effort to address issues of climate change following the principles of UN Framework Convention for Climate Change. We strongly hope that the commitment by Cambodia would inspire similar commitment from our development partners.

I believe that the next two days of this forum will offer a good venue for us to understand, learn and discuss some important topics that lead to some pragmatic recommendations that could be used to support sustainable development under the framework of the climate change convention.

Finally, I would like to wish you all the four gems of Buddhist blessing: Longevity, Nobility, Happiness and Strength and I would like to declare the First National Forum on Climate Change open.

**Thank you.**

## Welcome Remarks – Day I by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

**Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia;**
**Excellencies Deputy Prime Ministers, Senior Ministers, Ministers and Members of the Government;**
**Excellencies from the Parliaments;**
**Excellencies the Ambassadors, representatives of the Development Partners, and NGOs,**
**Venerable Buddhist Monks;**
**Ladies and Gentlemen - participants in the forum;**
**Teachers and Students,**

On behalf of the National Climate Change Committee (NCCC), Ministry of Environment (MoE) and myself, I am very proud and pleased to extend my warm welcome Samdech Akka Moha Sena Padei Techo Hun Sen, Prime Minister of the Kingdom of Cambodia and the NCCC's Honorary Chair, for making time in his busy schedule to preside over the opening ceremony of the First National Forum on Climate Change, making the event pleasant, warm, and ceremonious. As chair of the NCCC, I would like to extend a warm welcome and my most sincere thanks to Samdech, the Prime Minister, for accepting the request to become the NCCC's honorary chair. This reflects a new pathway for Cambodia's climate change work and also signifies the high importance given by the government leadership on climate change, which is a severe threat at both national and regional levels as well as at the global level. I would like to welcome warmly Excellencies, Lok Chum Tev, national and international representatives of the Senate and the National Assembly, government ministries and institutions, Ambassadors to Cambodia, the UN Resident Coordinator, development partners, multilateral institutions, government officials from relevant ministries and provinces and municipalities, representatives of the private sector, teachers and students, national and international NGOs, and all participants for their participation in the opening ceremony.

**Samdech the Prime Minister,**

**All participants in the forum!**

I would like to report to Samdech, and distinguished national and international guests, that there is currently a global consensus that climate change is one of the most significant challenges facing humanity in our development history and it is becoming a matter of concern among politicians and members of society at all levels globally, in both rich and poor countries. The Intergovernmental Panel on Climate Change's Fourth Report further clarifies that substantial emissions from human activities are the main cause of climate change, including global warming, sea level rise, and severe, more frequent and unpredictable floods and droughts. This represents an immense threat to socio-economic development and poverty reduction efforts and requires appropriate responses. A report by British economist Professor Nicholas Stern, on the Economics of Climate Change indicated that global warming may cause a 20 percent global economic downturn if no action is taken and 200 million people will become refugees as their homes are damaged by floods and droughts. Recent scientific studies illustrate worrying findings on the effects of climate change, such as coral bleaching in the tropics, accelerated glacier and polar ice cap melting and sea level rise that may cause severe effects on water resources, the agricultural sector, food security, people's health and livelihoods, infrastructure and ecosystems.

As a Least Developed Country, Cambodia is vulnerable to climate change. More than 80 percent of its population lives in rural areas and depend for their livelihoods on agriculture and other natural resources. Their adaptation capacity with regard to finance, skills, technology and infrastructure is particularly limited.

For the period from 1997 to 2007, the National Committee for Disaster Management reported that Cambodia suffered from 12 floods. As a result, 1,125 people lost their lives and damage totalled US$300 million. In the same period, five drought spells were responsible for damage valued at US$140 million. While we gather together here, some people in provinces surrounding the Tonle Sap and in the northeast have been suffering from Cyclone Ketsana and the National Committee for Disaster Management has reported that dozens of people have either lost their lives or been injured, while their property and houses and crops have been damaged. This is a sign that Cambodia is feeling the damaging effects of climate change that rarely occurred in the past.

**Samdech the Prime Minister,**

**All participants in the forum,**

As national focal point for the UNFCCC, and under continuous guidance of the government leadership, MoE has been making efforts to implement the Convention and the Kyoto Protocol through the Clean Development Mechanism. For instance, Cambodia approved six renewable energy projects, making it the leading country among the 49 Least Developed Countries. Cambodia is promoting implementation of adaption projects under the National Adaptation Programme of Action (NAPA), as adopted by the Government in 2006.

Established by the Government in 2006, the National Climate Change Committee has been strengthening and deepening its actions as an inter-ministerial body of the Royal Government of Cambodia, aiming to effectively carry out its roles and responsibilities to coordinate and monitor the implementation of the Government's policies, strategy, legislation, and plans to respond to climate change Recent acceptance by Samdech Akka Moha Sena Padei Techo Hun Sen, the Prime Minister of the Kingdom of Cambodia, of a request to become the honorary chair of the NCCC is an important stimulus for the NCCC in achieving its mission. NCCC members have so far been playing an important role in organizing the First National Forum on Climate Change today, as well as in mobilizing resources to respond to climate change issues. I, therefore, would like to take this opportunity to express my appreciation to their Excellencies the vice chair and members for their efforts.

**Samdech the Prime Minister,**

**All participants to the forum,**

We all understand that climate change is not only an environmental issue, but an inter-sectoral and multi-disciplinary issue requiring close collaboration and coordination among all relevant ministries and agencies of the Government, development partners, civil society and the general public. In this context, the First National Forum on Climate Change today is important and timely for all agencies to share information and knowledge and exchange best practices and to discuss responses to climate change and mainstreaming of climate change into policy and sectoral development plans, as well as promoting cooperation and coordination of activities in the sector between the Government, development partners and other relevant stakeholders.

I have the honour to inform Samdech and all distinguished guests that present in the forum are 700 representatives from national institutions at all levels such as the Parliament, ministries and agencies, provinces and cities, and representatives from embassies, development partners, NGOs, civil society, teachers and students, and Buddhist monks. In the coming two days, the forum will continue its sessions at the Intercontinental Hotel where about 200 participants will attend.

I believe that under Samdech Techo's clear, firm and wise policy, our country will overcome all challenges posed by climate change and take up emerging opportunities to contribute to its sustainable development. Samdech's practical leadership experiences with his win-win strategy in national reconciliation, and in turning a nation that was once severely afflicted, being at the forefront of the world cold war and also being affected by the genocidal regime of Pol Pot, to become a peaceful, national reconciliation, and development forefront in both Buddhist and civil actions. The foundation for hope and trust is that under Samdech's leadership, the country will overcome all the challenges posed by climate change.

Finally, on behalf of the NCCC, and the leadership and officials of the MoE, I would like to wish Samdech, Lok Chum Teav and the entire family great success and wisdom to lead the country for continued peace and sectoral development, as wished by all Cambodians.

May I wish all Venerable Buddhist monks, Excellencies, and ladies and gentlemen the four Buddhist blessings.

**Samdech the Prime Minister,**

**All participants in the forum,**

To provide a basis for understanding and discussion in the coming two days, and with my strong affection for the whole forum, and I would like to invite Samdech Techo the Prime Minister to offer guidance and recommendations in this opening session.

**Thank you very much.**

## Welcome Remarks – Day II by Mr. Douglas Broderick, UN Resident Coordinator

**H.E. Dr. Mok Mareth,**
**Chairman of the National Climate Change Committee and**
**Senior Minister of the Ministry of Environment,**
**Excellencies,**
**Development Partners,**
**Honorable Guests,**
**Ladies and Gentlemen,**

First of all, I would like to congratulate the National Climate Change Committee for their leadership in organizing this important event.

On behalf the UN country team, it is my privilege to be here this morning to participate in the opening session at the First National Forum on Climate Change. As you know, climate change is an issue that can no longer be ignored, nor denied. The way we address it, by finding ways to minimize its effects and by adapting the way we work and live to be more environment-friendly, is of crucial importance. This is especially the case in a country like Cambodia, which, due to its high levels of poverty, is at significant risk.

As such, today represents an important first step in initiating a dialogue on this important matter with all key stakeholders – the Government, development partners, civil society, and Cambodia's citizens. I thank you all for being a part of this significant forum.

I would like to take a few moments to examine both the challenges and the opportunities that lie ahead of us on the road to addressing climate change.

### Challenges

The effects of climate change, which we can already see in Cambodia in coastal degradation in Koh Kong, unpredictable weather patterns, droughts and flooding, push people beyond their historical coping zones. Without appropriate social safety nets in place to offer support to those affected, or sufficient infrastructure to quickly repair damaged villages and towns, climate change will pose a significant challenge to human development if not properly addressed.

The poor will suffer the consequences first, and with the greatest severity. Eighty percent of farmers grow just one crop of rice per year. Less than 7 percent of arable land is irrigated. As a result, changes in rainfall patterns can have devastating effects on livelihoods. This has the potential to impact greatly on the economy, but also has implications for food security and poverty reduction as a whole. As I have already briefly mentioned, other key areas such as fisheries, water, coastal zones and eco-systems will be similarly affected.

The challenges posed by climate change are not restricted by national boundaries. In addition to its own country-specific threats, Cambodia may also suffer the consequences of impacts in neighboring countries. This may include migration from displaced Mekong delta communities, or upstream impacts on river eco-systems caused by reduced catchment to Cambodia.

Failure to cope with these impacts will undermine the progress towards the Cambodia Millennium Development Goals, and thus will impact on Cambodia's economic and social development.

**However, within these challenges lie opportunities.** Increasing donor support and setting up carbon market finance systems will make funding more available to address the climate change challenges and to ensure sustainable development and low-carbon economic growth. Cambodia can also benefit from technology transfers and knowledge sharing from other countries.

Cambodia can implement mitigation measures that not only to reduce greenhouse gas emissions but also to ensure economic benefits. This could include improved energy efficiency in buildings, using renewable energy technologies, protecting forest cover, conserving ecosystems and encouraging private companies to invest in the Clean Development Mechanism model, which contributes to greenhouse gas reduction and at the same time ensures sustainable development through the use of alternative and renewable energy. Investing in clean technologies can address both the financial crisis and climate change issue by generating more jobs while protecting the environment. A simple practical example of the Clean Development Mechanism is a biogas project that captures methane from piggeries to produce electricity at Samrong Thom, Kandal Province. Not only have more jobs been created, but families involved in the project are now able to generate more income by selling electricity and by selling carbon in the market.

To reduce the threats and seize the opportunities, Cambodia must be better informed about the consequences of inaction, and of the country's particular vulnerabilities. Robust planning, policy and institutional frameworks must be in place, and there must be sufficient infrastructure to cope with the possible negative impacts in the near and long term. Cambodia should prepare itself to move towards a low-carbon economy that contributes to sustainable development and poverty reduction.

In other words, Cambodia must ensure that its development does not exacerbate the climate change crisis. At the same time, it must find the fine balance that ensures the development of the country is not hindered or slowed by putting in place climate change adaptation and mitigation measures.

**This can be achieved through strong partnerships.** Cooperation and collaboration among cross-sectoral government agencies, and with key stakeholders, including development partners and civil society, is another opportunity that I envision. It is a cross-cutting issue that requires all sectors of the Government, development partners, civil society organizations, and the private sector to work together to address the issues.

The current and future Cambodia development result would not be sustainable if we do not talk and act to address climate change today.

**Excellencies, ladies and gentlemen**

**The United Nations has placed climate change high on its development agenda.** We are committed to addressing climate change issues by supporting and assisting the Royal Government of Cambodia in close collaboration with key development partners, civil society and private sectors. We will continue to provide support to the Government to improve coordination, enhance awareness and understanding about climate change and mobilise technical and financial support to address national capacity development needs and policy and institutional gaps.

The UN will also continue to coordinate with key development partners to facilitate policy dialogue on climate change on different sectoral and thematic areas according to the specialization of each agency.

In addition, the UN will continue to raise awareness on climate change, in particular through the UN Global Campaign called "Seal the Deal" that invites everyone to sign a petition to pressure country leaders attending the CoP 15 conference in December this year to reach a solution and agree on a new climate deal that will help

to reduce the effects of climate change and ensure a sustainable future for future generations. Just this past weekend, 700 high school and university students in Siem Reap signed the petition to show their support to the deal.

I can also share with you that the new United Nations Development Assistance Framework (UNDAF) that UN agencies are currently developing together in Cambodia also identifies climate change as a priority. The UN agencies have currently been working on climate change on different sectors. For example, FAO, IFAD and UNDP are working on climate change adaptation for agriculture and water resources, WFP and IOM are working on immediate disaster relief and disaster preparedness and management, WHO and UNICEF are working on the studies of climate change impacts of health especially on women and children; UNIDO is working on Energy Efficiency and Reducing Emissions; while UNDP is also working on sustainable forestry and the Reduced Emissions from Deforestation and Forest Degradation initiative. These UN agencies are also partnering with key development partners under respective specialized areas to ensure better impacts on the work they are doing. Developing capacity of national and local authorities, civil society and the private sector to promote climate change adaptation and mitigation is a significant element of the new framework, which maps UN assistance to the country for 2011-2015. We will use the resources we have on the ground, and will seek additional resources if required, to implement our commitments on climate change.

**Finally, let me take a moment to talk about the global climate change meeting that will take place in Copenhagen on December 7-18.** 192 countries around the world will take part in the 15th Conference of the Parties (COP 15) to United Nations Framework of Convention on Climate Change to discuss future agreements that will shape the way the world deals with issue. In the lead up to this crucial meeting between global decision makers, it is the right time for Cambodia to host an event like this forum to enhance better understanding about climate change issues and promote dialogues before the Conference of the Parties.

We have only one planet to live on. How we all live and develop in the future must be consistent with maintaining the capacity of our ecosystems. But we must also find a balance between development and ecosystem preservation.

Sealing a new climate change agreement will require unwavering political will, so that national interests do not obstruct achieving what is best for our planet as a whole. If the deal reached is also a deal for development, we could set the stage for future generations to live in greater peace and prosperity across our world. We need to invest up front now, to protect our planet and the lives of all of us and our descendants.

We know what needs to be done, and we know we collectively face choices. We can do nothing, or too little, or our world can take bold actions together to confront the climate change challenge.

This December, in Copenhagen, I hope we will collectively, summon the courage to act.

I am certain this will be a successful forum, as I can see that many crucial issues relating to climate change in Cambodia will be discussed. But discussion should not end with the last session on the last day. You, the participants, must continue this discussion with your counterparts, stakeholders, colleagues and peers. Together, we must keep the debate alive. Together, we must ensure that Cambodia harnesses the opportunities presented by climate change, and works hard to minimize the threats.

**Thank you for your attention.**

## European Union

# Welcome Remarks – Day II
# Mr. Rafael Dochao Moreno, Chargé d'Affaires a.i.,
# Delegation of the European Commission to Cambodia,
# at
# First National Forum on Climate Change
# 20 October 2009

**Excellencies,**
**National and International Guests,**
**Ladies and Gentlemen,**

The European Union (EU) has long been at the forefront of international efforts to combat climate change and has played a key role in the development of the two major treaties addressing the issue, the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, agreed in 1997.

The EU has been taking a global leadership role in unilaterally addressing its own greenhouse gas emissions since the early 1990s. In 2000 the European Commission launched the European Climate Change Programme (ECCP) which led to the adoption of a wide range of new policies and measures. These include the pioneering EU Emissions Trading System, which has become the cornerstone of EU efforts to reduce emissions cost effectively, and legislation to tackle emissions of fluorinated greenhouse gases.

Monitoring data and projections indicate that the 15 countries that were EU members at the time of the EU's ratification of the Kyoto Protocol in 2002 will reach their Kyoto Protocol target for cutting greenhouse gas emissions. This requires emissions in 2008-2012 to be 8 percent below 1990 levels.

However, Kyoto is only a first step and its targets expire in 2012. International negotiations are now taking place under the UNFCCC with the goal of reaching a global agreement to address climate change after 2012. Despite the slow UNFCCC negotiations in Bangkok recently, the EU believes that there is still a window of opportunity for an ambitious climate deal at the climate change conference in Copenhagen. Copenhagen is a rare opportunity for joint global political action.

**Excellencies,**
**Ladies and gentlemen,**

Back in January 2007, as part of an integrated climate change and energy policy, the European Commission already set out proposals and options for an ambitious global agreement in its communication Limiting Global Climate Change to 2°C: The Way Ahead for 2020 and Beyond.

EU leaders endorsed this vision in March 2007 and agreed to start transforming Europe into a highly energy-efficient, low-carbon economy, by cutting emissions independently of what other countries decide to do. To underpin these important commitments the EU's 2008 climate and energy policy sets the following ambitious targets for 2020.

First, cutting greenhouse gases by at least 20 percent of 1990 levels and by 30 percent if other developed countries commit to comparable cuts. Second, increasing the use of renewables (wind, solar, biomass, etc) to 20 percent of total energy production. Third, cutting energy consumption by 20 percent of projected 2020 levels by improving energy efficiency.

Moreover, on 10 September 2009, the European Commission put forward a blueprint for scaling up international finance to help developing countries combat climate change. This initiative aims to maximise the chances of concluding an ambitious global climate change agreement at the climate conference in Copenhagen. It is the first major meaningful proposal on the table on how we might finance the battle against climate change. The sums involved are potentially significant and could mean an EU contribution of some €2-15 billion a year by 2020, assuming an ambitious agreement is reached in Copenhagen.

**Excellencies,**
**Ladies and gentlemen,**

The EU is turning political consensus into practical action and will implement its commitments through tough self-imposed measures, while recognizing that the financing issue is central to prospects for reaching an ambitious agreement in Copenhagen. By now it should be clear to everybody that climate change is not an environmental issue but a real development challenge affecting all of us and ignoring borders and continents, and therefore:

**Our mitigation action must be collective.**
**Our adaptation action must be now.**

On mitigation the combined pledges by developed countries today are still not sufficient to reach the 25-40 percent emissions reduction objective for 2020 required to keep global average temperature rise below 2°C. The EU has urged other developed countries to come forward with more ambitious targets and major developing economies to put on the table the mitigation actions that they envisage.

On adaptation, it is time to realize that the need to adapt is not an option we can choose.

Efficient and timely adaptation will reduce the costs of the negative impacts of climate change substantially. Therefore the EU is already assisting developing countries today to find ways to adapt to climate changes and reduce their vulnerability as follows:

First, the EU Action Plan on Climate Change and Development ensures climate change is incorporated into all aspects of EU development policy. It will help developing countries to implement the UNFCCC and the Kyoto Protocol, and support more research into tackling climate change. The action plan is funded through the Commission's geographical programmes for countries and regions, and its programme for the environment and sustainable management of natural resources.

Second the Global Climate Change Alliance (GCCA) will assist the least developed countries and small island developing states to take part in the climate change dialogue, feeding into the discussions on a post-2012 agreement under the UNFCCC. It will also provide concrete support for adaptation and mitigation measures and support the inclusion of climate change in development strategies and programmes.

Finally, the links between climate change and security in the broadest sense of the term should not be underestimated. Will climate change be a conflict driver or a peace multiplier? Unmitigated climate change beyond 2°C might lead to unprecedented security scenarios as it is likely to trigger a number of tipping points that would lead to further accelerated, irreversible and largely unpredictable climate changes. Investment in mitigation to avoid such scenarios, as well as ways to adapt to the unavoidable should therefore go hand in hand.

**Excellencies,**

**Ladies and Gentlemen,**

I would like to remind that the European Union as a whole is the largest contributor to development assistance in the world. The EU and its member states also took, as the first larger bloc of developed countries, bold political decisions to tackle the effects of climate change.

In view of these commitments the EU will assist countries most vulnerable to climate change, including Cambodia, to strengthen institutional capacity to be better prepared to the possible consequences of climate change.

7-18 December 2009 will be a crucial milestone for humankind. The world is expected to agree on further international action to tackle climate change. The amount of substantive political and technical work in the seven weeks ahead of the start of the Copenhagen conference presents a formidable challenge ... but is not impossible.

Therefore allow me to conclude with a quote of Al Gore who stated that "as more and more people understand what's at stake, they become a part of the solution, and share both the challenges and opportunities presented by the climate crisis". I sincerely wish that this First National Forum on Climate Change will be an excellent opportunity for us to contribute to this solution while making everybody aware that this as a collective responsibility.

**Thank you for your attention.**

## Opening Remarks – Day II by H.E. Mok Mareth, Senior Minister, Minister of Environment, NCCC Chair

## First National Forum on Climate Change
## Phnom Penh, 20 October 2009, InterContinental Hotel, Phnom Penh
## Unofficial Translation

**Your Excellency Douglas Broderick, UN Resident Coordinator**
**Your Excellency Rafael Dochao Moreno, Chargé d'Affaires, Delegation of the European Commission**
**Excellencies, Ladies and Gentlemen, senior management and staff of national ministries/agencies and municipality/provinces of the Royal Government**
**Excellencies, Ladies and Gentlemen representatives of the diplomatic corps, development partners, the private sector and non-governmental organizations**
**Ladies and Gentlemen, national and international guests**

Today, I have the great honor and pleasure to participate here in this First National Forum on Climate Change. On behalf of the National Climate Change Committee (NCCC) and on behalf of the Ministry of Environment, I would like to warmly welcome your Excellencies, Ladies and Gentlemen participants of the forum who kindly accepted the invitation to participate in this First National Forum on Climate Change.

**Excellencies, Ladies and Gentlemen!**

This year is the 10th anniversary of climate change activities in Cambodia. In 1999 we started our first climate change project to prepare the Initial National Communication under the UN Framework Convention on Climate Change (UNFCCC), after the country ratified the Convention in 1995, just two years after the first general election in 1993. Subsequent climate change activities of the Royal Government as well as of the Ministry of Environment, the Focal Point of the UNFCCC and the Chair of the NCCC, have brought impressive achievements in institutional strengthening, technical capacity building, research, preparation of policy and response measures to climate change, implementation of the UNFCCC and its Kyoto Protocol via the Clean Development Mechanism (CDM), and strengthening cooperation among concerned line ministries, agencies and development partners. The Rectangular Strategy Phase 2 highlights the Government commitment to mobilize resource to address climate change.

Nevertheless, climate change remains a new challenge that can threaten socio-economic development and may have negative impacts on the national development efforts if no adequate responses are taken, in particular in the current Cambodian context where understanding about climate change impacts and opportunities is still limited. In this regard, the initiative of the NCCC to organize this First National Forum on Climate Change this year and others in subsequent years is necessary and timely for sharing information and experience on climate change responses; integrating climate change into policies and sectoral plans; and promoting cooperation and coordination of climate change activities among Government institutions, development partners, NGOs, and other concerned stakeholders. The latter is very crucial in the current situation when stakeholders pay increasing attention to climate change and climate change-related activities are growing both within the countries and in the international arena. For instance, in recent years we have witnessed new initiatives throughout the world such as the EC Global Climate Change Alliance, the World Bank/Asian Development Bank Pilot Programme for Climate Resilience, the Japanese Cool Earth Partnership, new initiatives of UN

organizations and some bilateral organizations such as Danida, Sida, Dfid, AfD, JICA, KOICA, and selected NGOs. As we can see, in addition to our traditional partners such as UNDP, UNEP and GEF, new players are emerging. Of course, this is both an opportunity and a challenge for Cambodia – how to build our capacity that will ensure proper coordination, efficiency and effectiveness, ownership, transparency and "country driven-ness."

Yesterday, we heard the opening remarks of Samdech Akka Moha Sena Padei Techo Hun Sen Prime Minister of the Kingdom of Cambodia, who informed us about the efforts of Cambodia, as a Least Developed Country, to address climate change, the country's priorities and positions in dealing with climate change in international negotiations. This can be used as a basis for discussion during the next two days. I am pleased to see the presence of your Excellencies, Ladies and Gentlemen representatives of key line ministries, development partners, the private sector, academia and NGOs. In particular, I am pleased to see many prominent national and international experts who will present and participate in discussions on an extensive range of themes, such as basic climate change science, climate change mitigation and adaptation, climate change mainstreaming into national policies and plans, aid effectiveness, climate change and biodiversity, communications, gender, CoP-15 negotiations, etc. All these themes are of paramount importance for Cambodia to prepare itself for addressing climate change in a comprehensive and effective manner. I hope that these presentations and discussions will help improve awareness and understanding of participants on key issues related to climate change mitigation and adaptation, as well as in proposing concrete implementation tools, project specific consultation, or development of policy recommendations.

I am particularly proud to see the active participation of representatives of the private sector and selected NGOs in the exhibition of their climate friendly products as per the invitation of the NCCC. This is a positive sign indicating that the Cambodian private sector increasingly understands its responsibility and inseparable role in addressing climate change. It is also a clear indication that climate change provides a market opportunity and that addressing this problem is commercially viable, at least partially, even under a condition where the Government has not intervened much.

**Excellencies, Ladies and Gentlemen,**

I do hope that within the next two days participants will have an opportunity to receive new knowledge, skills, information and useful experience, as well as to actively participate in discussions on key themes to ensure that we fully use the unique opportunity provided by the forum toward climate change capacity strengthening in Cambodia. The presence of your Excellencies, Ladies and Gentlemen representatives of Government institutions, development partners, the private sector and NGOs manifests our common interest in and concern about climate change. It also indicates our will and commitment to address climate change.

In conclusion, on behalf of the NCCC, senior management and staff of the Ministry of Environment, I would like to wish you all happiness and a very successful forum.

**Thank you.**

## Opening Remarks – Day III by H.E. Lim Kean Hor, Minister of Water Resources and Meteorology

**Excellencies,**
**Ladies and Gentlemen!**

First of all I would like to welcome Excellencies, Ladies and Gentlemen to today's session of the forum. I have today the great honor to participate in the national workshop on climate change, a global theme and trend of great concern, particularly for us in Cambodia.

Now allow me to comment that when talking about climate change, it is not a new global issue or work. The problem has been progressing for billions of years now and you may have noted the loss of dinosaurs and loss of habitats for mammoths. These were due to climate change and the loss of dinosaurs in Cretaceous-Tertiary was due to changes of global temperature, meaning that an abrupt cooling caused the species to become extinct. We, therefore, acknowledge today that the climate is changing. Here there are two distinct concepts to bear in mind - climate change and climate variability.

As one who has been following and studying the issue, I can say that the presented data and trends were based on projections and no one can tell exactly of its effects, and the long term projections are all different. If talking about institutional arrangement, there are two tendencies to discuss the issue.

First, in Cambodia, Lao, and the Philippines, the climate change committees reside within the environmental agency, while in France, Japan and Malaysia, the work on climate change is operated under the national meteorological institution. The assessment and thinking are also different and not yet agreed, and the recent meeting in Malaysia did not reach an agreement. The climatologists made their assessment based on the observed data from individual countries compared to the regional and global trend; however the environmentalists made their assessment based on changes in the ozone layer.

Second, there remains a lack of full agreement on the effects of climate change. For instance, the regional and global climate change, on the one hand, is irreversible. The climate variability, on the other, occurs in each individual country with it the cycles such as floods and heat waves could recur in a number of years.

Third is the use of models. Mathematical models have been correctly replaced every three years, but this should be done more frequently as climate change progresses at great speed. For example the CPT (Climate Prediction Tool) as used by meteorologists developed in the US and the PRECIS (Providing Regional Climate for Impacts Study) that are used with climate change.

Fourth, the dissemination of results from project has so far not agreed as some say some parts of the world would, by 2100, have an average increase between 0.74°C and 2°C, another report says only 0.74°C, while other says 0.5 m, and other – 0.7 m or 1 m. Thus, there is disagreement on it as it is simply a projection. Nevertheless, we acknowledge that we are in a situation or a world where climate change is being discussed.

As for Cambodia specifically, in 1963, 1979, 1997, 2002 and 2004 we experienced El Niño, which brought about warmth, in 1997 and 1998 we were under another phenomenon called Dipole Index, while in 2000-2001 we faced La Niña that brought with it cooler weather, particularly the millennium flood that threatened Cambodia. From 1981 to 2008, the average dry season rainfall increased by 0.5 percent to 1.0 percent and the wet season rainfall increased from 0.2 percent to 0.5 percent, while the average temperature for the same period increased from 0.2-0.3°C, particularly in March, April and May, and the mean minimum increased by 0.2°C

in December, January and February. As for storms, it never happens in the country but originated in the Pacific and moves to Asia. The recent 16th storm, Ketsana, had damaging effects on a number of our provinces but came to Vietnam and about 60 km from the border with Rattanakiri province. Ketsana was damaging, the vortex speed at the centre was 160 km/hr, and the displacement speed was only 15 to 16 km/hr, thus wherever it arrived it caused severe damage in the range of 250-260 km. It should have brought about damage to the whole Cambodia, if the centre had been in Kampong Thom. Luckily we have mountain ranges that prevented the storm from entering the country, as a result only its effects were felt.

In fact, what concerns or considerations should Cambodia have? First, we need to raise public awareness. Cambodia does not cause climate change but we are a victim as Samdech Prime Minister had said at the opening of the forum: "Cambodia is not the cause of this natural event, but we are a victim, therefore whether or not assistance is provided, we should not be blamed for it."

Second, there is a need for broad dissemination about the negative effects and the Ministry of Environment is thus responsible for this, and people should be informed of the causes of climate change. Third, there is a need for continued monitoring and people have to be provided with prior and timely forecast, and this falls under full responsibility of the Ministry of Water Resources and Meteorology. I commit to ensure that an international standard meteorology center is developed within the mandate of fourth parliamentary legislature, although we expect a challenge to secure US$10 million for the facility. We still need some equipment and expertise. For farmers, they should be informed six months prior to the farming season of the likely occurrence of drought or storm in a particular month in order to reduce and prevent damages from climate change.

Third, Cambodia is an agrarian country with 80-85 percent of the population being farmers. Thus we are seeking for an improved method and means for expanding water retention capacity for the dry season and preventing the damage caused by floods in the wet season. Our ministry is thus faced with two problems – too much water in the wet season and too little water in the dry season. We thus need to normalize the situation whether in the wet or dry season, and it is the responsibility of our officials at both national and provincial levels to serve the nation and our people. Do not forget that Cambodia agriculture contributes 36 percent of GDP. We were very pressed recently, having been faced with water shortage, we had floods in Kampot, followed by storms. Selection of high yielding short term rice varieties would be the best option.

As advised by Samdech Prime Minister and consistently promoted by the Ministry of Agriculture, Forestry and Fisheries, our farmers should abandon long term varieties, but cultivate only short and medium term ones. I have told Samdech Prime Minster that if we could turn to short term rice then we should have the least concern over drought. However, changing the traditional practice of our farmers is not simple. Farmers in some provinces have not turned to dry season rice as they are used to doing only wet season rice farming. Ensuring that they do both wet and dry season rice remains a challenge, even asking them to reduce long term rice farming is already difficult. Another issue is to take action to prevent sea water intrusion. The Ministry of Water Resources and Meteorology in collaboration with Agence France de Developpement has rehabilitated a sea dike at Prey Nup and as a result 12,000 ha are placed for farming free from concern of sea water intrusion. Similar measures are needed for the coastal province of Kampot.

Fourth, development has to be sustainable, where environmental protection has a role to play. Lots of talks in this forum are about utilization of renewable resources. Now there is severe criticism of hydropower development. Is Cambodia taking into consideration the impacts of hydropower development in Vietnam, Lao and China? As chairman of the National Mekong Committee, I have advocated not only at the National Mekong Committee, but also at the government level. For Cambodia, should develop our renewable resources or continue with

charcoal? Using charcoal is obsolete and places high pressure on forests, an environmental concern. Cambodia does not have coal to turn to. Vietnam and a number of other countries in the region contain coal. We want to develop wind power, but there is limited potential in the country. Samdech Prime Minister has said recently in China that nuclear power is too sophisticated for Cambodia, and its share of supply is only about 30 percent in France. We have hydropower potential, why can't we use it? Without it, we don't need to talk of development. If electricity is available at affordable prices, all sectoral development – agriculture, water resources, tourism, garment – would progress. Cambodia has only potential, and unfortunately since we are poor, we cannot develop it.

Inviting investors for the development is challenging, similar to investment in irrigation schemes. It is not easy as irrigation is located in remote areas and not easily seen, unlike a bridge, and also there is no recovery of cost. People have the freedom to air their own thoughts but we also have the freedom to give our explanation. Even building a house would cause impacts; a high rise building would block airflow and view for the poor. All are related to the environment.

Last is the continued international cooperation for addressing climate change such as adaptation. This is the attention paid by this workshop, the Clean Development Mechanism and utilization of renewable energy. This is essential to Cambodia. Although we are not the cause of the problem, we share our responsibility for seeking response measures to avert and avoid climate change in the region and in the globe. As mentioned by Samdech Prime Minister, Cambodia is a small country but it is also one of the members of the world community.

Finally I would like to wish you all a successful forum and in seeking ways for adaptation and advance prevention. May the four Buddhist blessings be with you all.

**Thank you.**

## Opening Remarks Day III by Mr. Jo Scheuer, Country Director, UNDP Cambodia

**Excellency Lim Kean Hor,**
**Minister of Water Resources and Meteorology,**
**Excellencies,**
**Honorable Guests,**
**Ladies and Gentlemen,**

It is my privilege to be here this morning on the final day of the First National Forum on Climate Change. Today's discussions focus on a number of crucial cross cutting issues such as sustainable economic growth, effective aid coordination, mainstreaming climate change into planning processes, biodiversity conservation and gender. Before the day draws to a close, we will have the opportunity to reflect on Cambodia's road map for the Conference of Parties talks in Copenhagen in December.

I would like to focus on the first two - sustainable economic growth and aid coordination - before briefly touching on biodiversity and gender.

Is it possible to address climate change and ensure sustainable economic growth at the same time?

I believe the simple answer is yes.

As we heard yesterday, climate change impacts every sector of society and every sector of society contributes to climate change. Hence, many countries have already embarked on the **transformation of their entire economies** to create low-carbon development pathways. Such a new development paradigm creates opportunities for sustainable economic growth.

Cambodia can choose a similar path through accessing different sources of finance and transfer of technologies – both international and national, public and private – to build on and sustain its impressive economic performance of the past. Cambodia could become a **model economy** that has a minimal output of (greenhouse gas) emissions and has reduced climate change risks through appropriate adaptation measures that protect economic growth.

Both the private sector and government need to work together to integrate **energy efficiency** into business policies and investment plans. The private sector should play a lead role in taking ownership of this. In return, companies stand to benefit from international carbon trading.

Introducing environmentally responsible measures will produce benefits for ordinary Cambodians. Some **low carbon economy initiatives** that could be expanded to benefit rural Cambodians include eco-tourism; sustainable use of non-timber forest products; agro-forestry; waste management; biogasifiers; biodigesters; renewable energy, improved cook stoves and solar lights, to name just a few.

I would like to offer another suggestion. **Cambodia could develop a "green, carbon neutral city" – a path many cities around the world have embarked on.**

For example, if tourism were the main industry of this **"green city"**, then hotels, travel agents and airlines could commit to reducing their emissions through alternative sources of energy. Remaining emissions could be offset hrough appropriate local schemes. Infrastructure could be specifically designed to minimize climate change impacts. Environmentally friendly practices such as public transport, traffic-free zones, and tree planting could be introduced.

Siem Reap could be a good candidate to launch a "Green City" initiative that over time would also increase its attraction as a tourist center. It may sound like an unachievable dream to make a city of 100,000 inhabitants – the country's second largest economic hub – "a green city". I think it is possible.

We can develop an integrated city plan combining both climate change mitigation and adaptation measures. We can promote energy efficiency in hotels and restaurants. We can equip every hospital, school and pagoda with solar panels and solar water heaters. We can promote the use of improved cook stoves and water filters in the city and suburbs. We can educate students, urban residents and hotel staff about energy saving techniques. We can build disaster resistant and mitigating infrastructure that would reduce the impacts of floods, as seen recently following Cyclone Ketsana.

Siem Reap, as a "green city", would not just be a tourist destination due to its precious historical and cultural significance, but also for its appeal as a model city with a low-carbon foot print.

But efforts like this cannot be achieved by the Government alone. They require the full commitment and support of development partners, civil society and the private sector. Good coordination leads to optimum aid effectiveness, and this brings me to my next point – **aid coordination.**

In order to reduce gaps and limit overlap, it is crucial that we carefully align the work we do with the Government's development priorities, as outlined in the National Adaptation Programme of Action to Climate Change (NAPA) and the National Communications prepared for the Climate Change Convention (UNFCCC).

It is possible that substantial additional resources can become available to Cambodia to address climate change adaptation and mitigation. Therefore, it is crucial that coordination and information sharing mechanisms are robust enough to ensure an efficient and effective national response.

The National Climate Change Committee and development partners have already begun to outline a **common approach for coordination and aid effectiveness for climate change.** This shows that there is a clear commitment by the community of development partners to follow **aid effectiveness and partnership principles.**

**Excellencies, ladies and gentlemen**

I would like now to briefly touch on the crosscutting issue of biodiversity. The links between biodiversity and climate change run both ways: **biodiversity is threatened by climate change, but the proper management of biodiversity and ecosystems can provide ecosystem services that can contribute to climate change mitigation and adaptation.** Cambodian forests, if well protected, will provide a significant opportunity for carbon trading through the anticipated REDD initiative (Reducing Emissions from Deforestation and Forest Degradation in Developing Countries). This encourages countries not to cut down forests but to gain benefits

from preserving them by claiming carbon credits. It could be a very important source of revenue and the catalyst to transform the forestry sector in Cambodia. In addition, intact ecosystems provide services such as water resource management, coastal protection, prevention of erosion, ecotourism and alternative livelihoods and also function as sanctuaries for endangered flora and fauna. All this will contribute to a sustainable growth path.

Finally, I would like to look at climate change through the gender lens. There is a threat that climate change effects will **expand existing patterns of inequality,** particularly gender inequality. It is well known that climate change most severely impacts the poor, disproportionately affecting their livelihoods and security. Among these, the majority are women. As a result, they are most likely to bear a heavy burden.

Yet, **they can also be positive agents of change and crucial contributors to livelihood adaptation strategies.** If women have the opportunity to actively participate in the solutions we discuss in this forum, they will be better prepared to manage their own livelihoods and contribute to those of their families and communities.

**Excellencies, ladies and gentlemen,**

Climate change is not just an environment issue. It is a development issue. **UNDP views climate change through the lens of poverty reduction and human development.** The support of the international community and the UN must be guided by a vision of inclusive and sustainable development. Cambodia can lead the way in building a green, low-carbon economy.

This may be the last day of the forum, but this event marks the beginning of our joint work to harness the opportunities of a low-carbon economy and reduce the vulnerabilities presented by the real impact of climate change. **I encourage all of you to keep this dialogue alive in the lead up to the 15th Conference of Parties in Copenhagen and beyond.** I hope to have the opportunity to interact further with all of you on the next steps and I wish you a successful day.

**Thank you for your attention**

## Closing Remarks by Mr. Qimiao Fan, Country Manager, World Bank

**Excellencies,**
**Ladies and Gentlemen,**

I am delighted to join with all of you here today at the closing of the First National Forum on Climate Change. I understand that you had two productive days with substantive discussions and it is a real pleasure for me to make a few closing remarks on behalf of the World Bank at this closing. Let me make it clear that climate change is urgent and a common issue in every country, for the people in developed countries and developing countries, particularly in less developed countries like Cambodia. The real issue literally is on their door step. The real issue is how to cope with the changing environment that impacts on the availability of food, water, energy health, and the sustainable livelihood. I think the core challenge for the Royal Government of Cambodia, and indeed for the people of Cambodia, is to adapt and to reduce the inevitable impacts of climate change. In think that, without adaptation, achieving the CDMGs is threatened. We have seen increasing floods and droughts and we see increasingly unpredictable and unfamiliar patterns of weather that can drain household financial resources.

Second, I wanted to appreciate and fully support the very important remarks Samdech Prime Minister Hun Sen made at the opening ceremony of this forum on Monday. The Prime Minister's remarks noted that Cambodia is the victim of others, most notably developed countries in climate change, because Cambodia has contributed little to climate change. The Prime Minister also noted that climate change cannot be ignored in Cambodia's national development agenda. He emphasized that Cambodia would face its responsibility in tackling the climate change challenges by both seeking to reduce the emissions and by reducing its vulnerability to the changing climate through integrated cross-sectoral planning. The Prime Minister also emphasized that this can only be achieved if developed countries fully face their own responsibilities.

Third, all countries must seek not just climate resilient development but also climate smart development. As you would know, the recently released World Development Report of the World Bank, entitled "Development and Climate Change", calls upon developed countries immediately to show leadership and make significant emission reductions. The report also calls upon them to work with developing countries to transfer or create technology and knowledge to both adapt to and mitigate climate change. I think that for the least developed countries, the focus must be on development and poverty reduction, but not just climate resilient but also climate smart. Climate change and our responses to it will dramatically change the comparative advantage of most countries on the globe. Those that are blessed with sun, wind, water and, forest like Cambodia should capitalize on it. Those that depend on fragile ecosystems must seek ways to protect them and find more appropriate uses of them.

Fourth, I think you would agree that Cambodia is a leader among the developing countries in preparing an adaptation program. The country has completed the National Adaptation Programme of Action with the help of a number of development partners, which identifies urgent priorities for adaptation. But I think it is essential that the implementation of the NAPA receives the funding and the support to meet the urgent need. Cambodia has established the National Committee on Climate Change under the very able leadership of the Senior Minister

and Minister of Environment. I believe these steps place Cambodia in a strong position to take full advantage of its agreement to be one of nine countries in two sub-regions to take part in the new Pilot Program on Climate Resilience, or PPCR. The PPCR will bring together the multilateral banks, like the ADB and the World Bank, the UN agencies and the bilateral agencies in a government-led programme to pilot the integration of climate impacts and adaptation into national development planning. The important feature of the PPCR is not just another assessment. It will provide real financial resources of US$30-60 million in the next few years to Cambodia to enhance institutional capacity and to support a full scale, on the ground investment programme that will enhance development, more importantly to make them more resilient to climate change.

Your Excellency, Senior Minister and Minister of Environment, Excellencies. Ladies and Gentlemen!

Climate change can become within 2°C. But for this to happen, all countries must act now, Act together and Act differently. We think we can do it and I think we must do it.

**Thank you.**

## Closing Remarks Day III by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

**Your Excellency Qimiao Fan, World Bank Country Manager**
**Excellencies, Ladies and Gentlemen, senior management and staff of national ministries/agencies and municipalities/provinces of the Royal Government**
**Excellencies, Ladies and Gentlemen representatives of the diplomatic corps, development partners, the private sector and non-governmental organizations**
**Ladies and Gentlemen, national and international guests**

First of all, on behalf of the National Climate Change Committee and the Ministry of Environment, I would like to express our deep gratitude to you all for giving your valuable time to participate in this forum up to its end.

Over the last 10 years, in difficult financial and technical circumstances, Cambodia has managed to achieve impressive results in the field of climate change. Nevertheless, the country is still facing many priorities in its long path towards addressing climate change. In this context, our collective work over the last two days is a new contribution to assist Cambodia in meeting some urgent priorities such as climate change institutional strengthening; preparation of legislation, policies, and plans to respond to climate change; resource mobilization and management; coordination and cooperation; research and development; preparation for negotiations at CoP-15, etc. Through the presentations and discussions in this forum, I am sure you all have received new knowledge about climate change, response measures and opportunities Cambodia can have.

**Excellencies, Ladies and Gentlemen**

We have more and more understanding that climate change is a serious global issue due to its dangerous impact on human development. The future of humankind is at stake if we continue to allow our ignorance to prevail over the wisdom that fossil-fuel based development has no future and will lead to collective suicide. If we are about to think of the future of our children, we must switch our development path into a low-, or even a zero-carbon mode.

As a least developed country, Cambodia has not been a cause of climate change. And it will not be in the near future. We are only the victim of a problem caused elsewhere. But we wish to be a part of the solution of this global problem, because of our political will and moral responsibility. More importantly, because addressing climate change makes sense, politically, economically, environmentally and technologically. One of the important messages of this forum is that we can turn the climate change crisis into a new opportunity for a more sustainable development.

The National Climate Change Committee with the Ministry of Environment acting as its Secretariat is ready to responsibly fulfill its mandate, to ensure cooperation, coordination, and partnership in an equitable, transparent, efficient and credible manner. We have a long way to go and we need many ingredients to ensure sufficient conditions for the success of our climate change work: legal and policy framework, technical and institutional capacity, funds and a credible management system, technologies and know-how, participation and coordination of stakeholders, etc. It would be difficult to meet these requirements without participation of all stakeholders based on their capabilities and comparative advantages. The acceptance of the "Moonlight" and the "Seal the Deal" signifies our commitment to work with all stakeholders to address climate change. This forum is by no means

the final result. It rather serves as a means for information sharing, dialogue, cooperation and coordination on a periodic basis. With its legal mandate given by the Royal Government, the NCCC is committed to create and ensure an enabling environment for all climate change players to have an equitable opportunity in participating in the climate change crusade.

In conclusion, on behalf of the NCCC and senior management and staff of the Ministry of Environment, I would like to express our sincere gratitude to all the participants, chairs, presenters and panelists for giving their valuable time to participate in this National Forum. I thank the representatives of the private sector for participating in the climate change fair. I particularly thank all the NCCC members and staff of the forum Secretariat for their hard work to successfully prepare this forum. I express our special thanks to our sponsors, namely UNDP, Danida, Sida and Oxfam America, for their generous financial support to this forum.

I wish you all the best and allow me to declare this forum closed.

**Thank you and see you next year.**

## Speech at Cocktail Reception by H.E. Dr. Mok Mareth, Senior Minister and Minister of Environment, NCCC Chair

**Distinguished Guests,**
**Excellencies, Ladies and Gentlemen,**

I want to thank you all for being with us here in this important Forum. I think it is not really a good time for me to make a formal speech now after a long working day for you all. You all must be exhausted and it is time to refuel for our session tomorrow. I just want to offer you a very short video documentary on how climate change can hurt the poor. This is not a fiction, it is real. And thanks to our UNDP colleagues for providing this excellent video. Now, I invite you all to enjoy the show, the drinks, and a more informal discussion during this evening time. Let us work together to reduce our carbon footprint for our own sake and for the sake of our children and children of our children. So, may I offer a toast for the success of this forum.

# APPENDIX 3. Draft Position for Cambodia

**Draft Cambodian Positions For Climate Change Negotiations**
**21 October 2009**

As a party to the UNFCCC, Cambodia fully supports the efforts to address climate change based on the key principles of the UNFCCC, namely "common but differentiated responsibilities and respective capabilities", "specific needs and special circumstances of developing country parties, especially those that are particularly vulnerable to the adverse effects of climate change" and the "precautionary principle".

**Adaptation to Climate Change**

- Annex 1 country parties of the UNFCCC should increase their financial support for adaptation activities in vulnerable countries, the commitment they have agreed to take under Article 4 of the UNFCCC.
- Commitment to adaptation should be binding in a future climate regime.
- Assistance for implementing climate change adaptation measures in least developed countries should be unconditional, country-driven and should not lead to increase of debt of these counties.
- Urgent and sufficient funds are required for the implementation of the National Adaptation Programme of Action Plan to Climate Change (NAPA) of Least Developed Countries.

**Mitigation of Climate Change**

- All countries should participate in greenhouse gas mitigation after the First Commitment Period of the Kyoto Protocol in 2012 based on the principle 'common but differentiated responsibilities' and their historical emissions.
- Developing countries should make their utmost effort to participate in greenhouse gas emission reduction including via the Nationally Appropriate Mitigation Action (NAMA). However, their efforts shall be conditional upon provision of financial support and required technologies by developed countries.
- The principles of the Kyoto Protocol shall be valid for any new international agreement on climate change based on Article 3.9 of the protocol.
- Simplified rules and procedures should be developed to promote broader participation of least developed countries in greenhouse gas mitigation projects with a focus on small-scale projects that provide more benefit to communities.
- Cambodia fully supports greenhouse gas mitigation from Reducing Emission from Deforestation and Forest Degradation (REDD) for a post-Kyoto climate regime with appropriate, fair and competitive incentives. However, allocation for promoting forest carbon sinks shall not compromise the efforts to reduce greenhouse gas emissions from renewable energy and energy efficiency, technology transfer to poor countries, as well as domestic efforts to cut emissions in developed countries.

**Technology Transfer**

- Cambodia appeals for transferring modern technologies for greenhouse gas mitigation and adaptation from Annex-1 parties to developing countries, in particular Least Developed Countries.
- There is a need to use a combination of both market and control mechanisms to promote transfer of climate-friendly technologies.
- Technology transfer to developing countries should be comprehensive and cover at least equipment, know-how, related information, capacity building and financial resource.
- In addition to North-South cooperation, it is important to promote South-South cooperation to ensure the transfer of low cost and appropriate technologies.

# APPENDIX 4. PowerPoint Presentations

First National Forum on Climate Change
Cambodia
19-21 October 2009

Introduction: Climate Change Science, Impacts, Opportunities and the UNFCCC

20 October, 2009

Mozaharul Alam
Regional Climate Change Coordinator

UNEP

UNITED NATIONS ENVIRONMENT PROGRAMME

## About Presentation

- Climate Change Science – Greenhouse Gases and Global Warming
- Reading the Signs – Temperature Rise, Sea Level Rise, Glacier Melting, Shifts in Hydrologic Cycle
- Impacts and Managing Impacts – Sectors and Ecosystem Systems
- UNFCCC and Its Ultimate Objectives
- Science and UNFCCC

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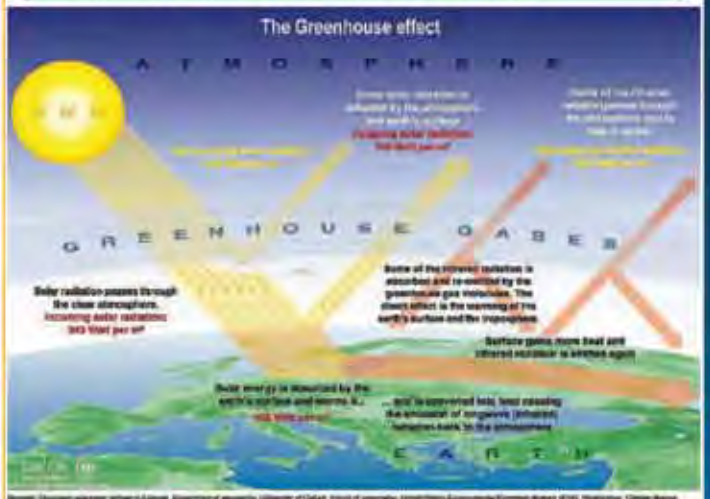
## Greenhouse Gases and Global Warming

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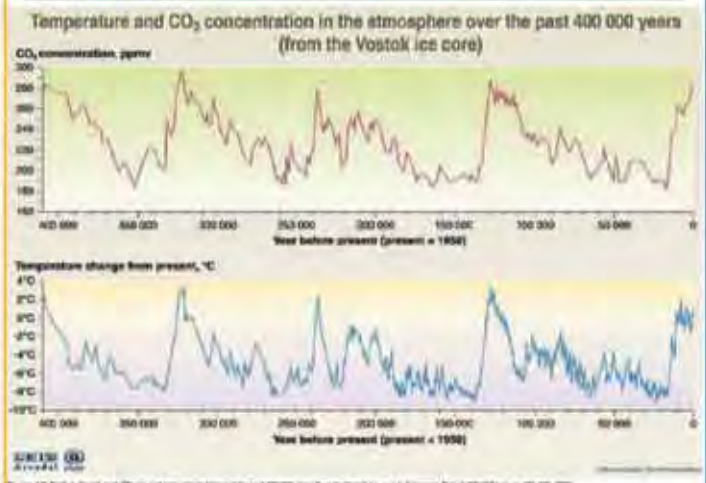
## Relationship between $CO_2$ Concentration and Temperature




UNEP

## Reading the Signs

- Global mean temperature has increased 0.74 °C during 1906-2005 and projected to be 1.8 to 5.4 °C by 2100;
- Sea level has risen at the rate 1.8 mm/year since 1961 and 3.1 mm/year since 1993. Likely to rise one metre by next century but with 5 or 10 times that in the following centuries;
- Ocean acidification that will damage or destroy coral reefs and the many species of marine life that inhabit or depend upon the ecosystem services of the reefs;

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## Reading the Signs

- Glacier in tropical and temperate is retreating fast – Gangotri has retreated more than 76 metres from 1996 to 1999
- Loss of tropical and temperate mountain glacier will disrupt irrigation systems and hydroelectric installations as well as alter the socio-economic and cultural lives;
- Shifts in the hydrologic cycle that will result in the disappearance of regional climates with associated ecosystem destruction and species extinction

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## Reading the Signs

| Sources of Sea Level Rise | Rate of sea level rise (mm per year) | |
|---|---|---|
| | 1961-2003 | 1993-2003 |
| Thermal Expansion | 0.42 ± 0.12 | 1.6 ± 0.5 |
| Glaciers and ice caps | 0.50 ± 0.18 | 0.77 ± 0.22 |
| Greenland and Ice Sheet | 0.05 ± 0.12 | 0.21 ± 0.07 |
| Antarctic Ice Sheet | 0.14 ± 0.41 | 0.21 ± 0.35 |
| Sum of individual climate contributions to sea level rise | 1.1 ± 0.5 | 2.8 ± 0.7 |
| Observed total sea level rise | 1.8 ± 0.5 | 3.1 ± 0.7 |
| Difference (observed minus sum of estimated climate contribution) | 0.7 ± 0.7 | 0.3 ± 1.0 |

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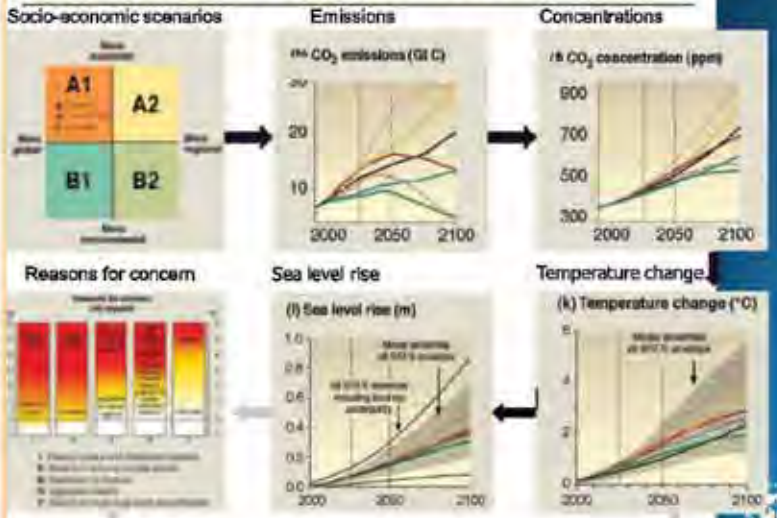
## Reading the Future Signs – Projection

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## Reading the Future Signs - Projected Global Average Surface Warming and Sea Level Rise

| Thermal Expansion | Temperature Change (°C at 2090-2099 relative to 1980-1999) | | Sea Level Rise (m at 2090-2099 relative to 1980-1999) |
|---|---|---|---|
| Case | Best estimate | Likely range | Model-based range excluding future rapid dynamical changes in ice flow |
| B1 Scenario | 1.8 | 1.1 – 2.9 | 0.18 – 0.38 |
| A1T Scenario | 2.4 | 1.4 – 3.8 | 0.20 – 0.45 |
| B2 Scenario | 2.4 | 1.4 – 3.8 | 0.20 – 0.43 |
| A1B Scenario | 2.8 | 1.7 – 4.4 | 0.21 – 0.48 |
| A2 Scenario | 3.4 | 2.0 – 5.4 | 0.23 – 0.51 |
| A1FI Scenario | 4.0 | 2.4 – 6.4 | 0.26 – 0.59 |

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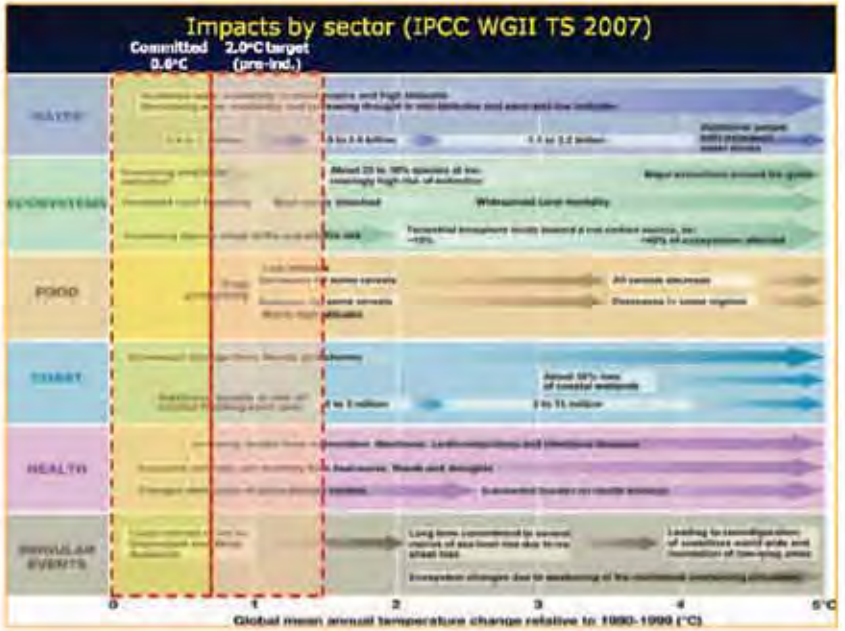
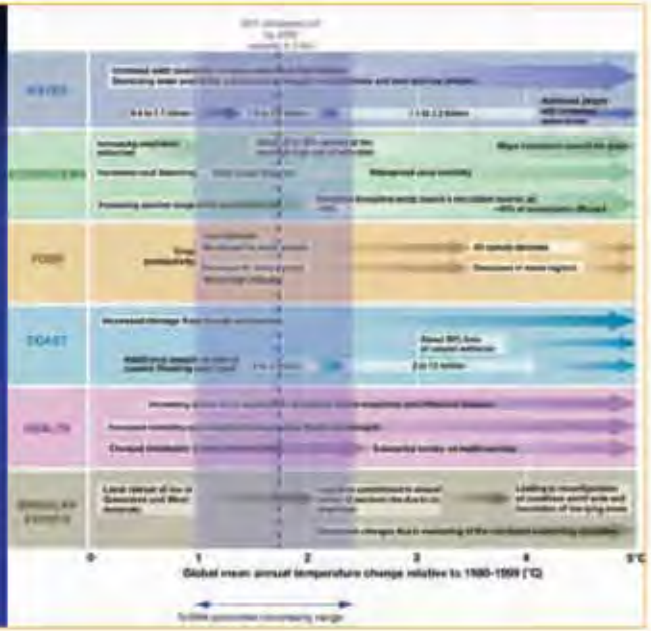
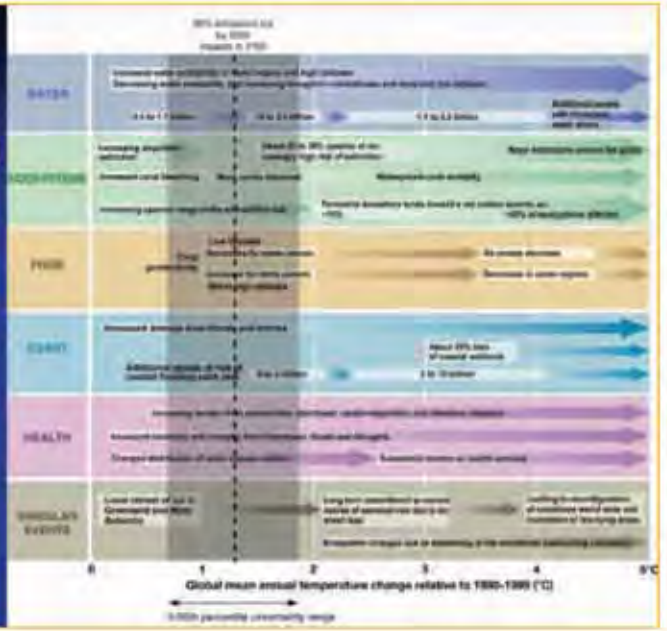



**Impacts under 50% emissions cut by 2050 [3% per year]** [Parry et al., Nature Reports Climate Change, June 2008]

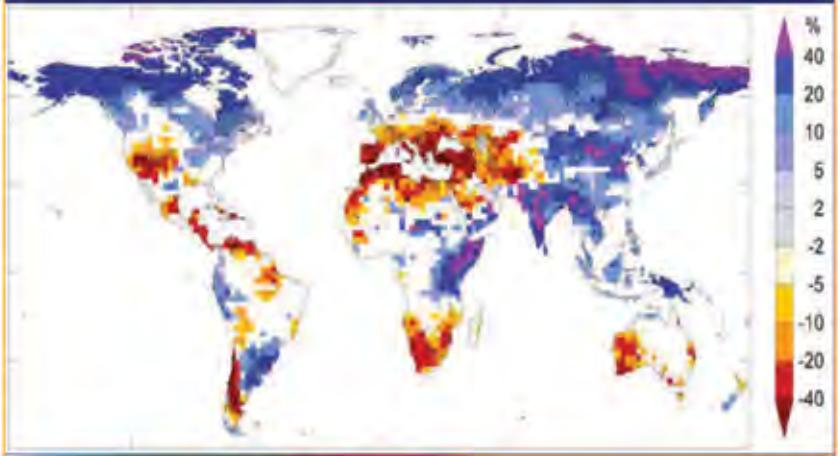



**Impacts under 80% emissions cut by 2050 [6% per year]** [Parry, et al.,2008]



## Key impacts stem from reduced water availability.

Projected changes (%) in run-off, 21st century.
White areas are where less than two-thirds of models agree, hatched are where 90% of models agree (IPCC 5YR)




## Disturbance of Marine Ecosystem - Coral reefs

- Symptoms
  - Live coral reduced 50-93 per cent; fish populations reduced 90 per cent
  - Apex predators virtually absent; other megafauna reduced by 90-100 per cent
  - Population explosions of seaweeds; loss of complex habitat
  - Mass mortality of corals from disease and coral bleaching
- Drivers
  - Overfishing
  - Warming and acidification due to increasing CO2
  - Runoff of nutrients and toxins
  - Invasive species

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## Impacts in this Region

- The damage caused by intense cyclones has risen significantly in the affected countries particularly South and South East Asian countries including Vietnam and Cambodia
- South-East Asia Increased occurrence of extreme rains causing flash floods, landslides and floods
- By the 2050s, freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease;
- Coastal areas, especially heavily-populated mega delta regions in South, East and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some mega deltas, flooding from the rivers;
- It is projected to compound the pressures on natural resources and the environment, associated with rapid urbanization, industrialization and economic development;
- Endemic morbidity and mortality due to diarrhoeal disease primarily associated with floods and droughts are expected to rise in East, South and South-East Asia.

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## Addressing Climate Change – System Management

- Managing Unavoidable - Ecosystem Management
  - Adaptation of Natural System
    - Water Management
    - Vegetation Management – carbon sequestration in forest
  - Manage Agriculture Adaptation
  - Management of Terrestrial Biomass
- Avoiding Unmanageable
  - Geo-engineering – carbon capture and storage

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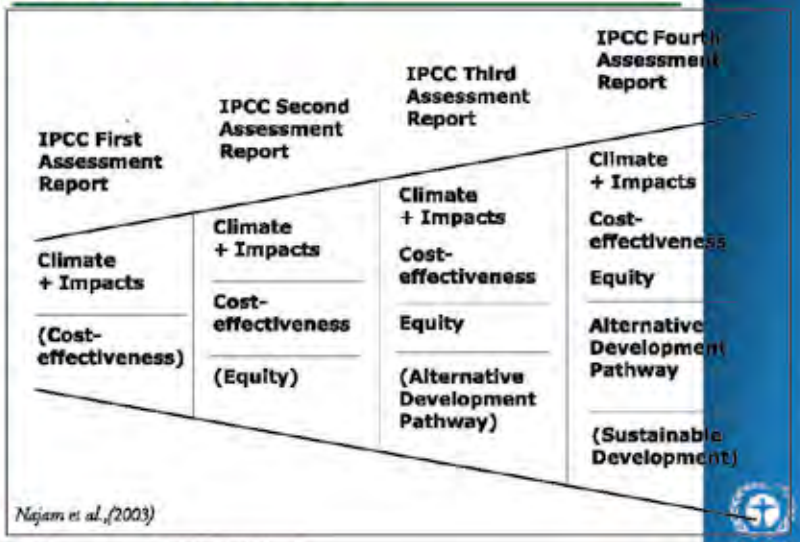
## Challenges for Adaptation

- Insufficient information and knowledge on the impacts of climate change and responses of natural systems to climate change;
- Limited studies on the interconnections between adaptation and mitigation options, costs and benefits of adaptation, and trade-offs between various courses of actions;
- The absence of information on adaptation costs and benefits makes it difficult to undertake the best adaptation option;
- The above limiting factors will be most constraining in developing countries where systems for monitoring and research on climate and responses of natural and human systems to climate are usually lacking;
- More relevant information such as on the crop yield benefits linked to changes in planting dates for various regions and on the optimal levels and cost of coastal protection investment in Vietnam and Cambodia as reported by Nicholls and Tol (2006) will be needed.

## Objective of the UNFCCC

- Stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.
- Such level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.
- The Framework Convention does not specify such "level of GHG concentration" and "dangerous anthropogenic interference".
- Timeframe for stabilization is also undefined in the convention.

## Science and the UNFCCC




## Thank You

Mozaharul Alam
Regional Climate Change Coordinator
United Nations Environment Programme (UNEP)
Email: mozaharul.alam@unep.org

UNITED NATIONS ENVIRONMENT PROGRAMME

# A Global Perspective on Climate Change

## Development and Climate Change

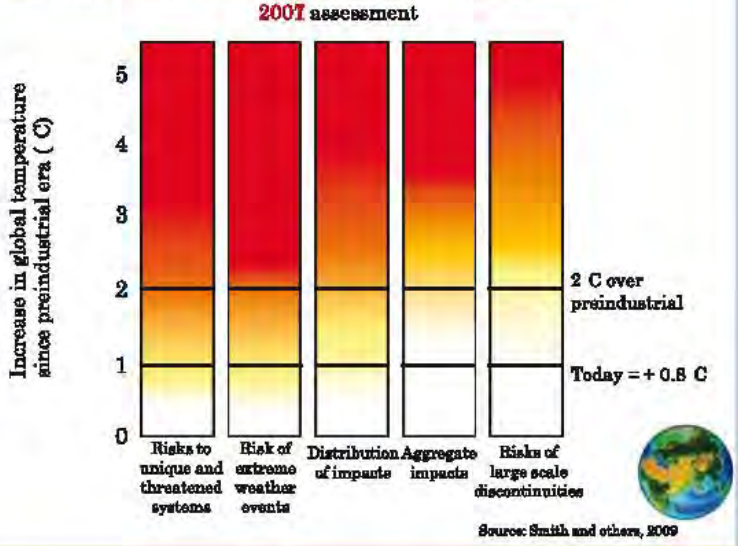
**World Development Report 2010**

Ian Noble
October 2009

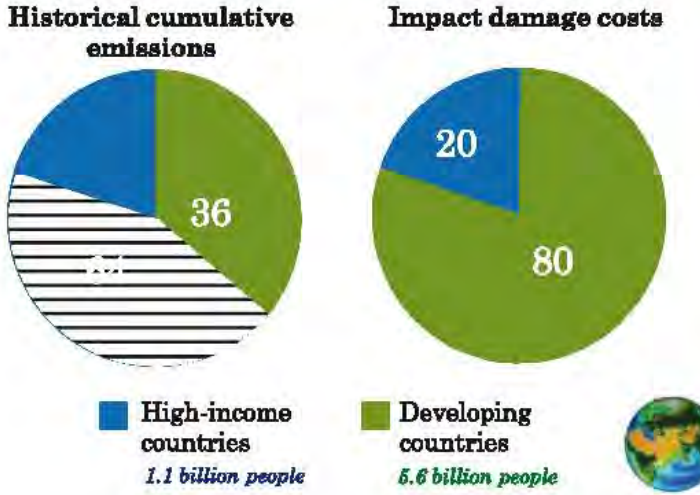
## Key messages of WDR2010

- Climate change—a serious and immediate threat to development
- A climate-smart world is possible, if we
  - ACT NOW
  - ACT TOGETHER
  - ACT DIFFERENTLY
- New resources, instruments and pressures are helping build momentum.

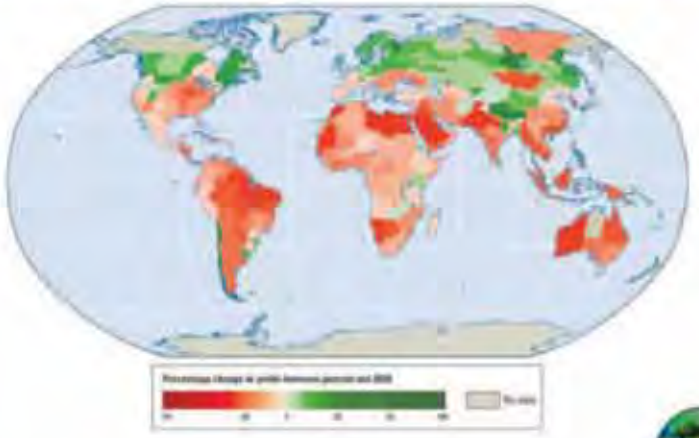
## Scientific consensus: serious and immediate



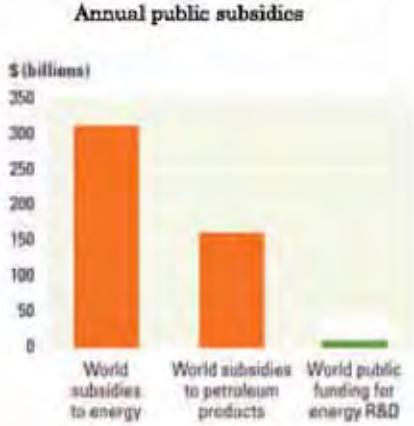

## Development consensus: The poor will suffer most



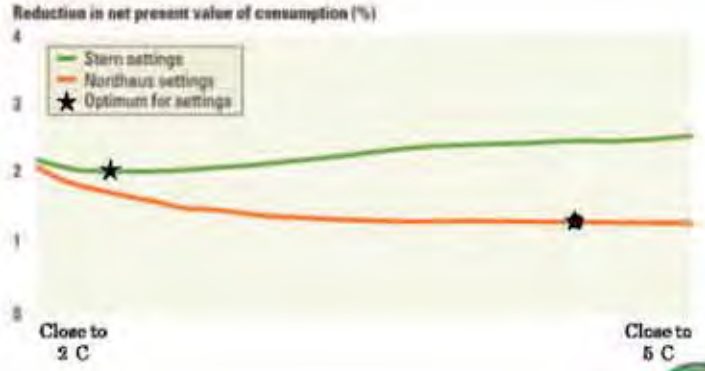
## DEVELOPMENT CONSENSUS: THE POOR WILL SUFFER MOST



## A CLIMATE-SMART WORLD IS POSSIBLE…




## …AND AMBITIOUS, PRECAUTIONARY POLICIES ARE NOT MUCH MORE EXPENSIVE.




## BUT TO MEET THE CHALLENGE, WE MUST

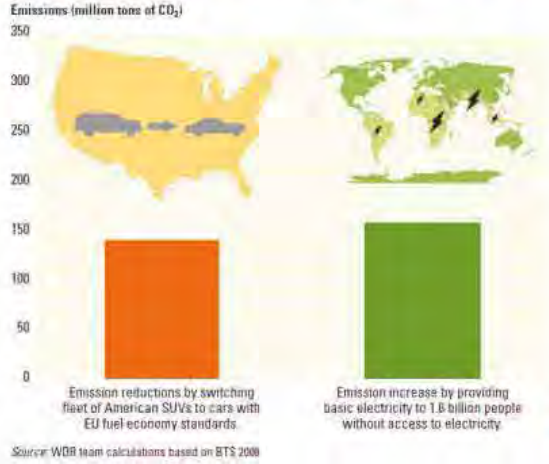
- ACT NOW
- ACT TOGETHER
- ACT DIFFERENTLY

*ACT NOW:*

## TODAY'S ACTIONS DETERMINE TOMORROW'S OPTIONS

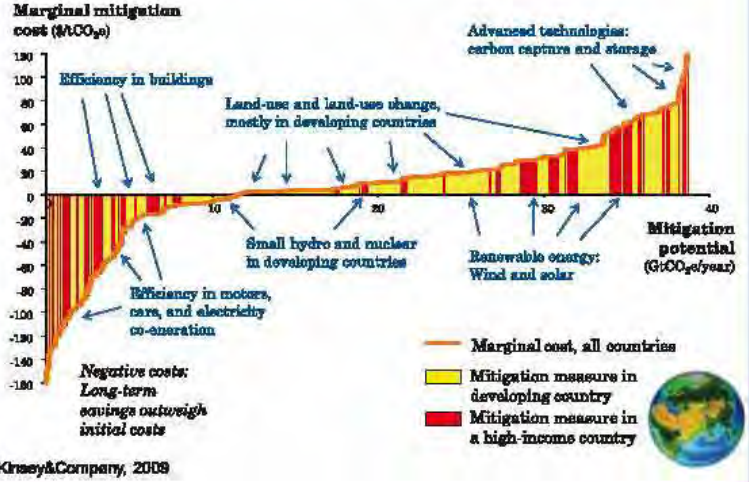

*ACT TOGETHER:*

## HIGH-INCOME COUNTRIES NEED TO TAKE THE LEAD




*ACT TOGETHER:*

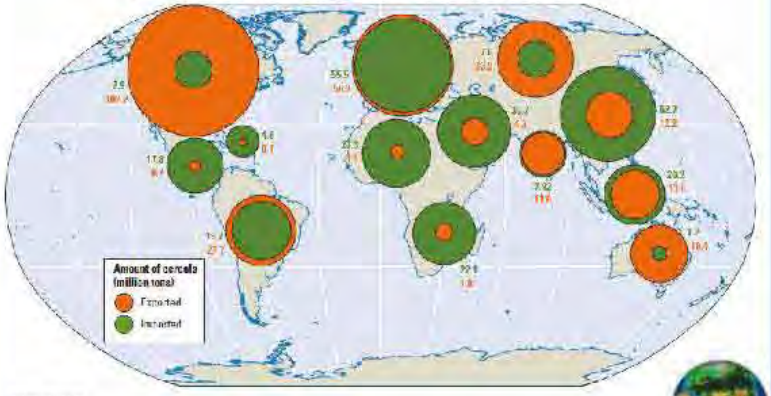
## BUT ALL HAVE A ROLE TO PLAY TO MANAGE COSTS




McKinsey&Company, 2009

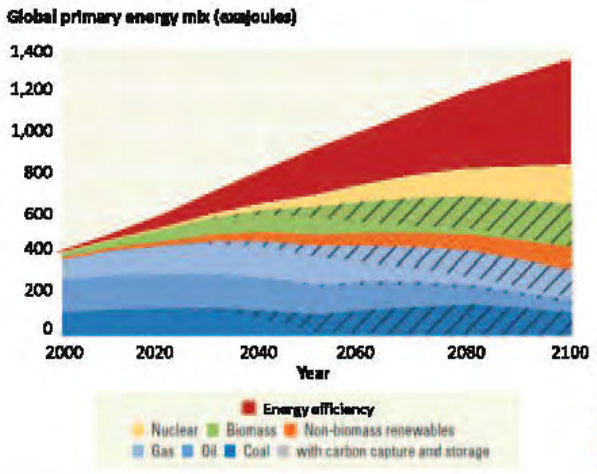
*ACT TOGETHER:*

## COOPERATION HELPS BUFFER SHOCKS



*ACT DIFFERENTLY:*

## RADICALLY TRANSFORM ENERGY SYSTEMS



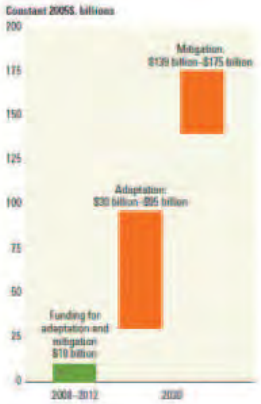

*ACT DIFFERENTLY:*

## MAKE *ROBUST* RATHER THAN OPTIMAL DECISIONS

*MAKING IT HAPPEN:*

## NEW RESOURCES

- Current volume not sufficient
- Need for massive scaling up
  - to reconcile equity and efficiency
- It can be done:
  - A financing challenge: $250-$550 bn in associated financing needs
  - But manageable – 3% global investments
  - Requires all options available




*MAKING IT HAPPEN:*

## NEW INSTRUMENTS

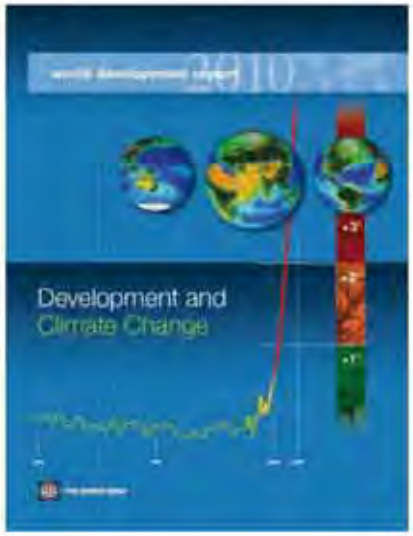
- To support communities and decisionmakers
- Low-tech and high-tech

*MAKING IT HAPPEN:*

## NEW PUBLIC PRESSURE

- We've come a long way
  - Increasing awareness and concern
  - Individuals and organizations are responding
  - Politics are changing
- More is needed to turn awareness into action
  - " Soft" policy tools - communication and education; social norms)
  - Create institutional mechanisms to deal with new challenges

## A CLIMATE-SMART WORLD IS POSSIBLE, IF WE…


http://blogs.worldbank.org/climatechange/

http://worldbank.org/WDR2010

# The Economics of Climate Change in Southeast Asia: A Regional Review

**Juzhong Zhuang**
**Assistant Chief Economist**
**Economics and Research Department**
**Asian Development Bank**

**National Climate Change Forum, 19-21 October 2009**
**Phnom Penh, Cambodia**

ADB

## Plan of Talk

- Why climate change matters for Southeast Asia
- Responding to climate change: adaptation
- Responding to climate change: mitigation
- Summary and policy messages

ADB

## I. Why climate change matters for S.E. Asia

- First, S.E. Asia is one of the most vulnerable regions in the world
  - Geographically vulnerable: tropical climate, long coastlines
  - High concentration of population and economic activity in coastal areas
  - Heavy reliance on climate-sensitive sectors
  - Millions trapped in poverty with low adaptive capacity

ADB

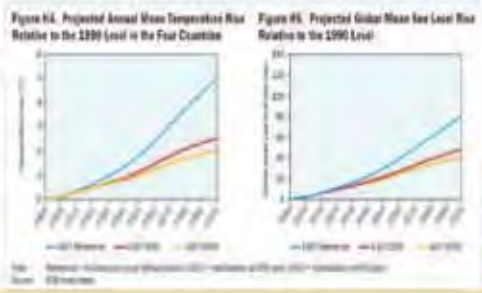
## I. Why climate change matters for S.E. Asia

- Second, climate is changing in S.E. Asia
  - Temperature increased by 0.1 – 0.3 °C per decade during 1951-2000
  - Precipitation trended downward
  - Sea level rose 1-3 cm per decade
  - Increased intensity and frequency of extreme events such as heat waves, droughts, floods, storms

ADB

## I. Why climate change matters for S.E. Asia

- Third, the worst is yet to come.
  - Without urgent action, S.E. Asia's mean temperature could increase 4.8 °C and sea level up 70 cm by 2100 from the 1990 levels



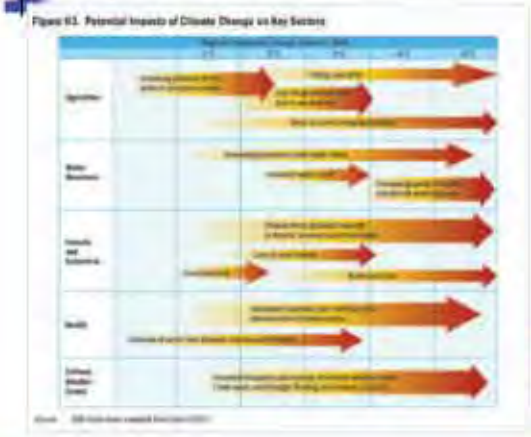
ADB

## I. Why climate change matters for S.E. Asia

- Third, the worst is yet to come.
  - Increasingly drier weather conditions over the next few decades; dry seasons could become drier and wet seasons wetter
  - Impact would be felt across sectors, disproportionately by the poor

ADB

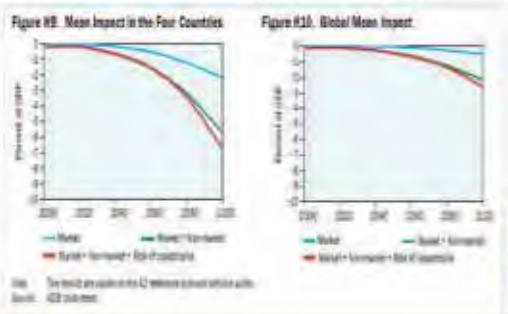
## I. Why climate change matters for S.E. Asia



ADB

## I. Why climate change matters for S.E. Asia

- Fourth, total damage could be equivalent to losing 6.7% of GDP each year by 2100
  - More than twice the global average loss



ADB

## II. Responding to climate change: Adaptation

- The region is already adapting, but more needs to be done.
- One priority is to strengthen overall adaptive capacity
  - Step-up efforts to raise public awareness
  - More research to better understand climate change and its impact, especially at local level
  - Enhancing policy and planning co-ordination
  - Mainstreaming adaptation in development planning

ADB

## II. Responding to climate change: Adaptation

- Another priority is to scale up proactive adaptation in key sectors
  - Water: improving water management and flood control system
  - Agriculture: more efficient irrigation/new crop variety
  - Forestry: safeguarding forests/planting new forests
  - Coastal resources: mangrove conservation/protective sea walls
  - Health: better surveillance/disease prevention
  - Infrastructure: climate proofing

ADB

## III. Responding to climate change: Mitigation

- Some data on the region's GHG emissions
  - S.E. Asia contributed 12% of the world's total GHG emissions in 2000, with its emissions rising twice as fast as the global average during 1990-2000
  - Land-use and forestry sector contributed 75% of the regional total, energy 15%, and agriculture 8%
  - Emissions from the energy sector is growing at the fastest pace

ADB

## III. Responding to climate change: Mitigation

- The forestry sector has the greatest potential for reducing the region's emissions:
  - REDD, afforestation/reforestation, and improved forest management
  - A study cited by IPCC indicates that S.E. Asia has the highest sequestration potential (about 40% of the world's total during 2000-2050) among all regions
- The region also has the largest technical mitigation potential in agriculture in the world

ADB

## III. Responding to climate change: Mitigation

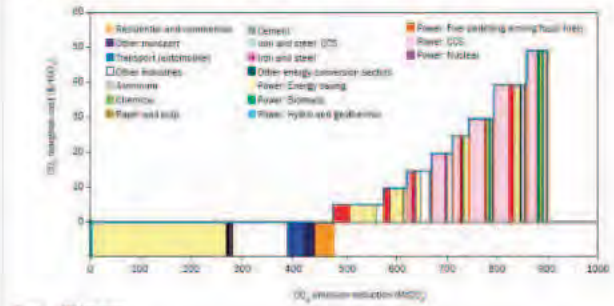
- The region's energy sector holds vast potential for mitigation
  - Improving energy efficiency reduces emissions and at the same time saves costs – "win-win" options
  - It is estimated that such "win-win" options would have the potential to mitigate 475 MtCO2 each year by 2020 (40% of BAU energy CO2 emissions that year)
  - Other options (fuel switching, renewables, CCS) can mitigate another 40% at a cost less than 1% of GDP

ADB

## III. Responding to climate change: Mitigation

- The region's energy sector holds vast potential for mitigation

Figure 8.12. Marginal Abatement Cost Curve for the Four Countries (2020)



ADB

## IV. Summary and policy messages

- Climate change is affecting S.E. Asia. The worst is yet to come. With no global actions, climate change could cost the region more than twice as high as global average by 2100.
- Combating climate change requires a *global solution* built on a *common but differentiated responsibility*. S.E. Asia should play an important part in working towards such global action given its high stake.
- The region has made significant efforts in adapting to climate change impact, but more is needed to *mainstream adaptation in development planning*.
- While adaptation is a priority, S.E. Asia should make *greater mitigation efforts*. Low carbon growth brings co-benefits.

ADB

## IV. Summary and policy messages

- Adaptation and mitigation require a *comprehensive policy framework, incentives* for private sector action, *elimination of market distortions, ample financial resources*, among others.
- *International funding and technology transfer* are critical for the success of adaptation and mitigation actions in S.E. Asia.
- The region should *enhance its capacities* to make better use of the existing and potential international funding sources.

ADB

## IV. Summary and policy messages

- *Regional cooperation* offers effective means to deal with cross-boundary issues
  - e.g. water resources, forest fires, extreme events, outbreak of diseases, and learning and knowledge sharing
- Need to strengthening *policy and planning coordination* among different ministries and levels of government
- Need for *more research*

ADB

**Thank You!**

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# CARBON MARKETS: Kyoto Protocol, CDM & Voluntary Markets

CAMBODIAN CLIMATE CHANGE FORUM
October 2009

Bridget McIntosh
Managing Director
Carbon Bridge Pte Ltd
bmcintosh@carbon-bridge.com

## Overview

- The imperative: Climate Change
- UNFCCC
- Kyoto Protocol
- CDM
- Voluntary Carbon markets
- Where are we now?

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## The imperative: climate change UNFCCC

- United Nations Framework Convention on Climate Change: Rio in 1992

> **stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system**

- Most countries, including the USA are signatories.

But!

The UNFCCC has no binding actions

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## Enter: The Kyoto Protocol

- Common but differentiated responsibility for developing and industrialised countries.
- Targets for industrialised countries worldwide reduce 5.2% below 1990 for 5 year period between 2008-2012
  - 8% for the European Union
  - 7% for the United States
  - 6% for Japan,
  - 0% for Russia and New Zealand
  - increases for Australia, Iceland and Norway
- Most countries devolve emission targets to industries through emissions trading scheme

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# Meeting Kyoto Protocol Targets

- Kyoto Protocol – globally on track to meet targets
  - "Hot air" in Eastern Europe and Russia
  - Helped with GFC
  - Domestic actions eg UK, Germany
  - Some countries still short of targets domestically
    - eg Japan; Italy; Canada; Spain
- Kyoto Protocol allows 'flexible mechanisms'; trading of emission reduction between countries
  - Joint Implementation
  - Clean Development Mechanism (developing countries)
  - Emissions Trading

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# The Kyoto Protocol and CDM Clean Development Mechanism

**A project in a developing country that reduces emissions below normal can sell those emission reductions 'credits' to Industrialised country with Kyoto Target**

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# CDM Projects Worldwide

| Status of CDM projects | Number |
|---|---|
| At validation – under audit | 2607 |
| In the process of registration | 232 |
| Withdrawn or Rejected | 743 |
| Registered, no CERs yet | 1268 |
| Registered. CER Issued | 566 |
| Total registered/Approved | 1634 |
| **Total CDM projects** | **5416** |
| Registered Projects in LDC | 13 |
| Submitted Projects in LDC | 47 |

Cambodia has 4 out of 13 Registered projects in LDCs

Jørgen Fenhann, UNEP Risø Centre CDM Pipeline 01-10-09

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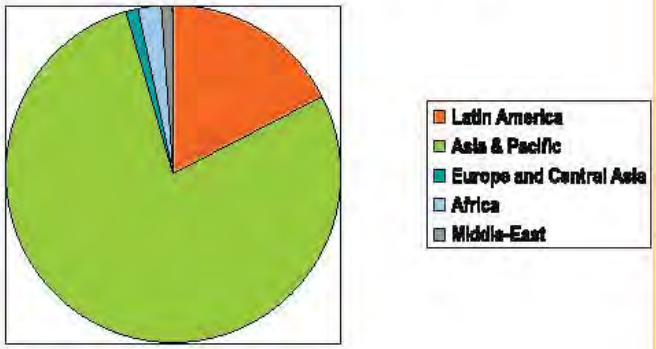
# CDM Projects Worldwide




Jørgen Fenhann, UNEP Risø Centre CDM Pipeline 01-10-09

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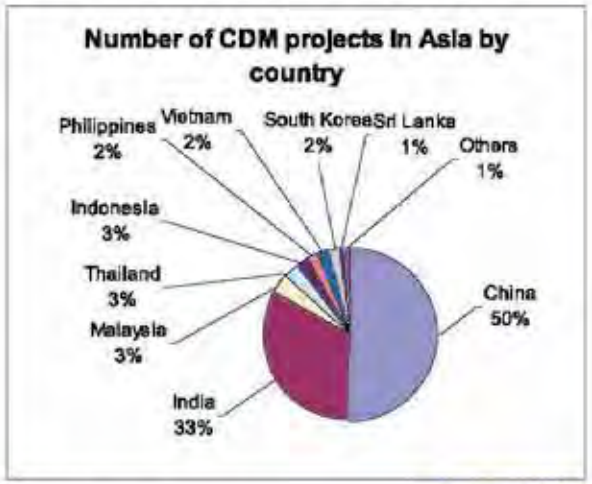
## CDM Projects in Asia

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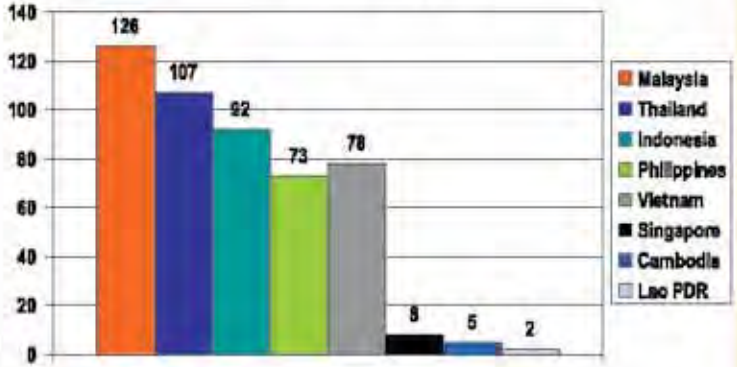
## CDM Projects in South East Asia
## Total 491




Jargen Fenhann, UNEP Risø Centre CDM Pipeline 01-01-09

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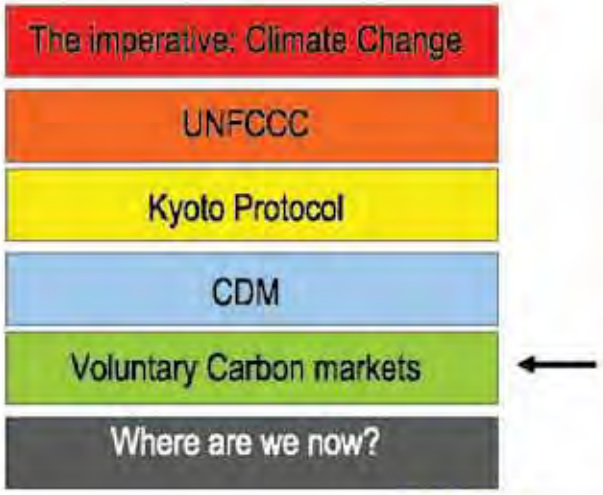


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## Voluntary Carbon Projects


Leaders Guide to Emissions Trading 2008 © Tiffin © & Carbon Partnership

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# Voluntary Offset Market

- Companies and individuals buy equivalent emission reductions to become 'carbon neutral'

- Buy offset carbon credits from emission reduction projects.
- Many Retailers selling offsets - over 100 companies
- Cambodia has own home grown offsets through Geres

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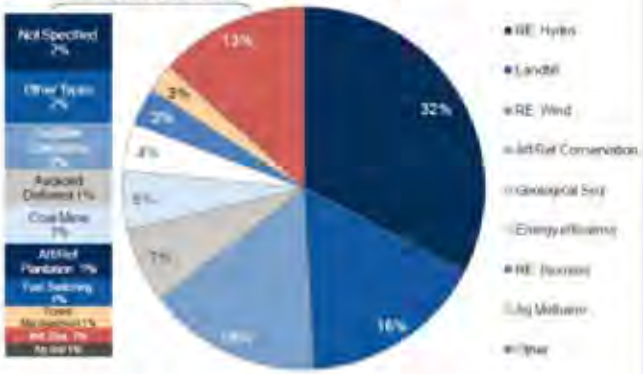
# Voluntary Offset Project Types

*Transaction Volume by Project Type, OTC 2008*




State of the Voluntary Carbon Markets 2008, Ecosystems Marketplace & New Carbon Finance

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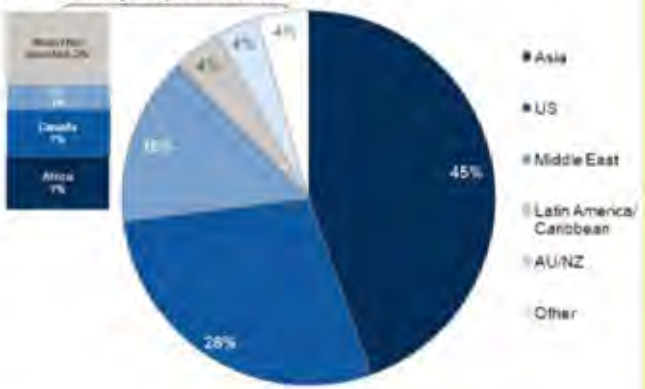
# Voluntary Offset Project Location

*Transaction Volume by Project Location, OTC 2008*




State of the Voluntary Carbon Markets 2008, Ecosystems Marketplace & New Carbon Finance

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# REDD Forestry Projects

**Reduced Emissions for Avoided Deforestation and Degradation**

- Deforestation and degradation account for ~20% global emissions

| Reduction in deforestation rates compared to 1990-2005 baseline | Amount of emission reductions |
|---|---|
| Percent | Billion tCO2-e per year |
| 5% | 153 |
| 10% | 306 |
| 20% | 612 |
| 30% | 918 |
| 40% | 1,224 |
| 50% | 1,530 |

- REDD - not incorporated into Kyoto Protocol, operated out of voluntary market (VCS and CCSB)
- Piolot projects in SEAsia, many in Cambodia

Ecosecurities REDD PolicyBrief and Carbon Market Briefing Paper December 2007

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The imperative: Climate Change

UNFCCC

Kyoto Protocol

CDM

Voluntary Carbon markets

Where are we now?

CAMBODIA

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## Carbon Projects in Cambodia

| Approved or Submitted Project | Date | |
|---|---|---|
| Angkor Bio Cogen Rice Husk Power | 10-Aug-06 | CDM PROJECTS |
| TTY Cambodia Biogas Project | 3-Sep-08 | |
| Biogas in Samrong Thom Pig Farm | 3-Dec-08 | |
| Kampot Cement Waste Heat Power | 17-Apr-09 | |
| Kamchay Hydroelectric BOT Project | Not yet | |
| W2E Siang Phong Biogas Project | Not yet | |
| Improved Cookstove Project | 2006 | VOLUNTARY |
| Song Heng Rice Husk Biomass | 2006 | |
| WCS Mondolkiri REDD Project | Not yet | |
| PACT Oddar Meanchey REDD project | Not yet | |
| Cardomoms REDD | | |

Jørgen Fenhann, UNEP Risø Centre CDM Pipeline 01-10-09, http://cdm.unfccc.int; & Voluntary Carbon Standard Oct 2009

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## The Projects – real mitigation





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## Overview

The imperative: Climate Change

UNFCCC

Kyoto Protocol

CDM

Voluntary Carbon markets

Where are we now? ←

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## The imperative

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Kyoto Protocol
expires end 2012

mitigate
adapt to climate change

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# Cambodia's Forest Background and Reduced Emission from Deforestation and Forest Degradation (REDD)

Dr. Keo Omaliss
Forest Administration
20 October 2009

## Outline of the Presentation

- Forest and Climate Change
- Background on Cambodia's forest
- REDD – an International process
- REDD in Cambodia
- REDD related Activities in Cambodia
- Follow-up action plan

## Forest and Climate Change

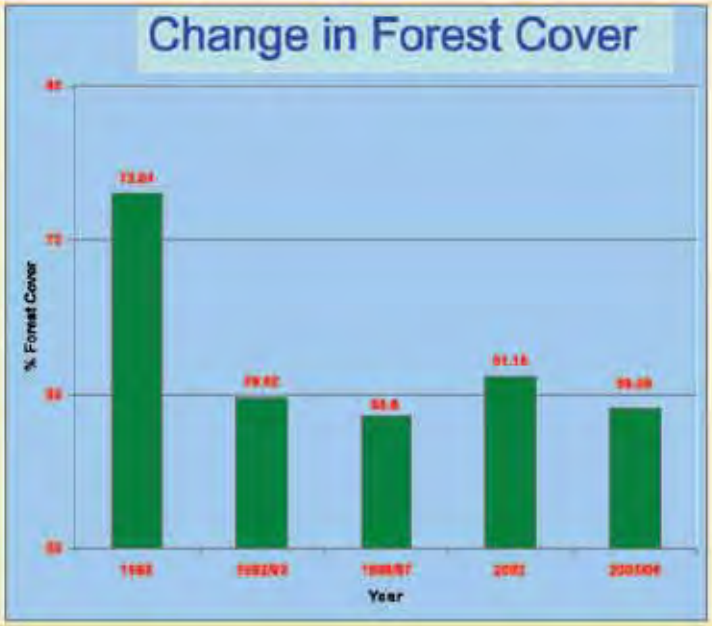
- Global forest cover: 3,952 mill ha = 30% of global land surface;
- Global forest loss: 12.9 mill ha/ yr;
- Emission from loss of forest cover: 5.8 Gt $CO_2$ a yr in 1990s;
- Emission from forest sector: 18% of overall emission;
- Climate change also causes negative impacts on forests (retarded growth, pest infestation).

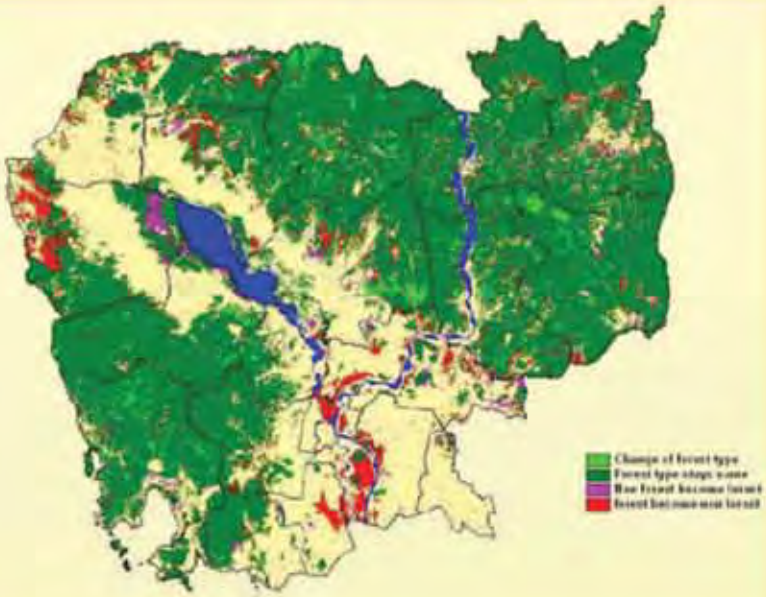
## Background of Cambodia's Forest

- Total country's land surface: 181,035 $km^2$

- Forest cover in 1965: 13,227,100 ha
- Forest cover in 1992/1993: 10,859,695 ha
- Forest cover in 2002: 11,104,291 ha
- Forest cover in 2006: 10,730,781 ha

## Change in Forest Cover



## Use of Forest Land in Cambodia

- Forest concession;
- Land concession;
- Protected areas;
- Protection forest;
- Community forestry and flooded forest;
- Wildlife conservation areas;
- Biosphere reserve and Ramsar sites

## On-going Deforestation

## Reducing Emission from Deforestation and forest Degradation (REDD)

- **COP11 under UNFCCC, Montreal 2005: Papua New Guinea and Costa Rica requested for inclusion of REDD;**
- **COP13 in Bali 2007 included REDD for negotiation;**
- **COP15 in December 2009 in Copenhagen will make decision on REDD;**

**- REDD project is successful when it reduces $CO_2$ emission.**

## REDD in Cambodia

- FA is the REDD executive agency and is responsible for assessing stocks of forest carbon and arrangements for commercializing Cambodia's carbon credits and services in forest sector:
  - Sor Chor Nor 699, date 26th May 2008, provides for focusing benefits for forest protection, helping participating communities, and developing of new REDD projects;
  - Sub-decree 188, 4th November 2008;
- Consultation under the Technical Working Group on Forest and Environment (TWG F&E)
  - MAFF, MoE, MEF, MoI, MIME, etc.,
  - DANIDA, JICA, FAO, UNDP, USAID, World Bank, etc.
  - NGO Forum, WCS
  - Private sector

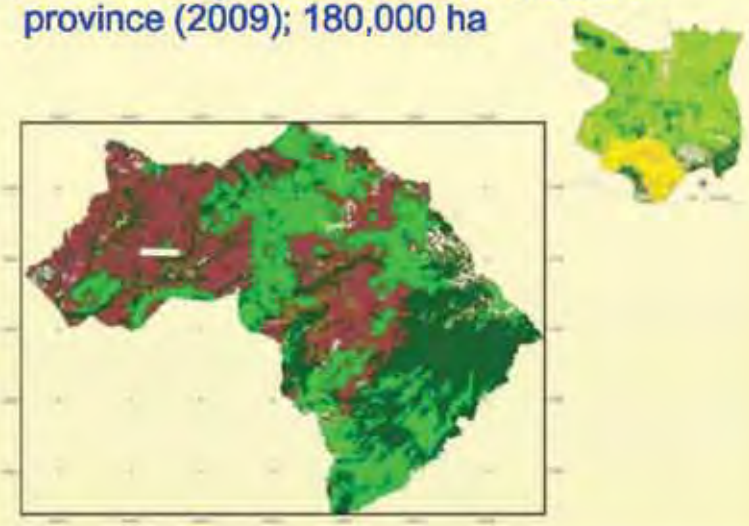
## REDD related activities

- REDD Negotiation under NFCCC
- Dialogue with Asean member countries (ARKN FCC);
- Participation in training workshops;
- Provision of training;
- Organizing consultations;
- Collaboration with bilateral and partner organisations

## REDD Testing in Uddor Meanchey (2008)

66,000 ha

## REDD Testing in Keo Seima, Mondul Kiri province (2009); 180,000 ha



## Follow-up Action Plan

- Mobilise resources to support implementation process (WB, UN-REDD);
- Strengthen capacity of the officials and stakeholders: forest inventory, GIS skills and REDD;
- Consult with additional stakeholders;
- Develop Action Plan on REDD;
- Develop National Carbon Account on Land Use;
- Promote Regional Cooperation.

# PROSPECTS AND CHALLENGES IN THE REDD IMPLEMENTATION:

## Vietnam's experience towards REDD readiness and country initiatives

**Dr. Pham Manh Cuong**
Department of Forestry (DoF)
Ministry of Agriculture and Rural Development (MARD)

## Overview

1. Overview on dynamics of forests in Vietnam
2. Vietnam's point of view on the REDD implementation
3. Country's experience
4. Prospects and Challenges

## I. Overview on dynamics of forests in Vietnam

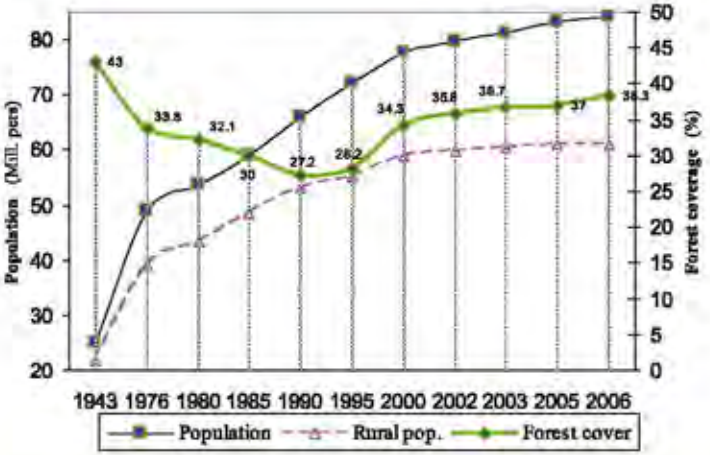
### 1.1 Brief introduction on forest in Vietnam

- Hilly and mountainous regions account for ¾ of Vietnam's total natural land;
- Vietnam has coastal lines more than 3,000 km long;
- Most of the mountainous and coastal wetland areas were formerly covered by a wide range of natural forests: tropical rain forest in most region, sub-tropical forest in the north and at high altitudes, mangrove forest along coastline, forests in peatland in the deltas;
- Forests are home to over 25 million people, most of them belong to ethnic minority groups and they are the poorest of the poor.

## 1.2 Dynamics of Forests in Vietnam

- Forest cover has changed dramatically and dynamically **over the time and space**, especially from the country reunification in 1975 up to date;
- Forest cover decreased from 43% (1943) to 28% (1995) BUT increased to 38.7% (2008). However, the changes are **not always** in progressive and the same in all regions;
- Forest expansion due to afforestation with fast growing species and short rotation, and natural regeneration: few canopy stories, low timber volume;
- Forest quality is continuously degraded: Area of primary forest reduced from 3.84 (1990) – 0.84 mill ha (2005) or 29 900ha/year;

## Forest cover changes




## II. Vietnam's point of view on the REDD implementation

## 2.1 Relevant policies & Programs

- Vietnam is identified as one of 5 most severe affected by climate change;
- GoV of Vietnam has paid great attention on responding to negative impacts of climate change;
- National Target Program to Respond to Climate Change (NTP-RCC) was approved in Dec 2008;
- MARD's Action Plan Framework (APF) to respond to CC
- National Policy on Payments for Forest Ecosystem Services;

## 2.2 Point of view

- REDD is one of the activities in the NTP-RCC and MARD's APF to respond to CC;
- REDD is one of key sub-programs of the Sustainable Forest Management Program of the NFDS;
- REDD implementation is expected to create an innovative and sustainable financing mechanism for SFM, biodiversity conservation and socio-economic development in rural areas;
- Based on voluntary basis , national circumstances and country ownership;
- REDD implementation should be well-organized in collaborative, coordinated, transparent and effective fashion;
- Promotes a close cooperation with countries in the ASEAN, especially with the countries in the Lower Mekong Basin.

# III. Vietnam's experience

## 3.1 Joined to International Initiatives

- **Feb. 2008**: Submitted the country view on REDD methodology and implementation process to the UNFCCC Secs;
- **July 2008:** The R-PIN was approved by the FCPF in Paris. Vietnam was the first country to sign the FCPF Participation Agreement. The discussion with the WB is under process;
- **March 2009:** The NJP was approved by the UN-REDD Policy Board Meeting in Panama;
- **July & August 2009:** the DPO was approved by Prime Minister on July 20. NJPD was signed by the MARD's Minister and the UN Resident Coordinator on August 06;
- The UN-REDD Prog was lauched on 16/8/2009

## 3.2 Institutional arrangement

- Establishment of the National Steering Committee (MONRE, MARD, other line ministries) to respond to CC and chaired by Prime Minister;
- MARD's SC committee for APF chaired by Minister;
- National REDD Network and REDD Technical Working Group chaired by the DoF;
- CC Network among Gov and NGOs chaired by CARE;
- CC- Public and private partnership (Ford Foundation);

## 3.3 Donors' coordination

- Organized Donor coordination meetings;
- Prepared an Institutional donors' matrix to mobilize the support from potential partners and to avoid overlap and conflicts;
- Discussed with ongoing foreign-supported projects: GTZ SFM Prog, ADB-FLITCH, Finland, etc.;
- Established Ambassadors' Climate change Forum;
- Created the INGOs Climate change Network chaired by Care International;

## 3.4 Capacity building

- Organized numerous national and regional technical training workshops;
- Japan funded studies on "Application of RS in C-stock estimation and its change" and "Screening potential land for A/R CDM and REDD in Vietnam";
- CC- Public and private partnership (Ford Foundation);
- Public awareness raising: mass media and e-Envi forums;
- Improved international negotiation skills for focal point and CC delegates;

# IV. The UN-REDD Program in Vietnam

**Status of "Quick Start" of the UN-REDD Programme**

| Country | Initial Programme | Full Programme |
|---|---|---|
| DRC | Signed, starting implementation | In planning |
| Tanzania | | Being finalized |
| Zambia | In scoping, formulation mission tbd | |
| Indonesia | | Being finalized |
| PNG | Budget allocated | In planning |
| Viet Nam | | Signed, starting implementation |
| Bolivia | In scoping, formulation mission 18 -22 August | |
| Panama | | Being finalized, funds earmarked |
| Paraguay | | In formulation |

## Results Framework (1)

1. **Objectives**

- Assist the Government of Viet Nam in developing an effective REDD regime in Viet Nam and to contribute to reduction of regional leakage
- Contribute to the broader goal of ensuring that "By the end of 2012 Viet Nam is REDD-ready and able to contribute to reducing emissions from deforestation and forest degradation nationally and regionally
- Consistent with and support for on-going GoV strategies and programs
- Support for obtaining the objectives of the UN Plan in VN

## Results Framework (2)

**2. Outcomes**

- **Outcome 1:** Improved institutional and technical capacity for national coordination to manage REDD activities in Viet Nam
- **Outcome 2:** Improved capacity to manage REDD and provide other Payment for Ecological Services at district-level into sustainable development planning and implementation
- **Outcome 3:** Improved knowledge of approaches to reduce regional displacement of leakage

## Results Framework (3)

**Highlights**

- Vietnam would like to start the REDD Prog ASAP and present the first results at the COP15 – selection of a suitable financing disbursement modality
- Experienced in preparing and implementing some Multi-donor progs: TFF, Highly Pathogenic Avian Influenza (HPAI), WB-UNDP-IFAD-GEF SFLMP but a UN-REDD & FCPF joint mission may be needed
- An additional proposal to expand the current NJP to get more support from the UN-REDD if the result of first phase is positive, more support is required and it is difficult to access to other funding sources.

## Budget Allocation ($m)

| Outcome | FAO | UNDP | UNEP | Total |
|---|---|---|---|---|
| 1. Improved capacity at central level | 0.62 | 0.96 | 0.09 | 1.67 |
| 2. Improved capacity to manage REDD at local levels | 0.74 | 1.29 | 0.09 | 2.12 |
| 3. Reduce regional displacement of leakage | 0.23 | 0.08 | | 0.31 |
| Sub-Total | 1.58 | 2.34 | 0.18 | 4.10 |
| Indirect Costs (7%) | 0.11 | 0.16 | 0.01 | 0.29 |
| **Total** | **1.69** | **2.50** | **0.19** | **4.38** |

# V. Prospect and Challenges

## 4.1 Prospect

- Political attention and support;
- Alignment of the interests of multiple constituencies, ongoing programs and strategies: i.e. NTP-RCC, NFDS, PRS, PES;
- Supplementary to **current national PES policy:** REDD= carbon sequestration = one of Envi services of the forests;
- **Brings co-benefits:** emissions reductions + Improved biodiversity conservation + Improved local livelihoods;
- Improved forest governance and capacity of the forest administration systems;

## 4.2 Constraints & Challenges at Global Level

- REDD is new and complex: REDD or REDD+ – still in debate;
- Governing and financing mechanisms: Additional ODA or market-based approach? New fund or added into existing ones? Who will take lead?
- **REL:** Scale & Methods? NFIMA is not primarily designed for REDD – a lack of data and reliability?
- **Diverse definitions** and classification systems on forest, deforestation and forest degradation;
- **Leakage:** project-based vs programmatic approach, ambition and existing capacity;
- **Permanence:** chicken-and-egg situation

## 4.3 Constraints & Challenges in Vietnam

- REDD requires new level of forest governance – A need to revise and complete the institutional arrangement and policies;
- Cooperation among government agencies and integration with on-going programs/projects (TA vs IP);
- A lack of technical capacity: in collecting, analyzing, synthesizing and reporting information, especially at local levels;
- **Insufficient information:** incomplete and outdated; data discrepancies & data sharing;
- A lack of reliable and comprehensive forest data to develop REL;

## Challenges

- Three forest categories with different management regulations: role of public services organizations (e.g., FMB)
- High opportunity costs and insufficient volume of finance to shift drivers of deforestation and degradation;
- Difficult to implement a transparent and practical payment system to individual households;

**Thank you very much for your attention!**

cuong.pham.rs@gmail.com

First national Forum on Climate Change

# The Current Status of Renewable Energy Development in Cambodia

By
Mr. TOCH Sovanna
Director of Department of Energy Technique, MIME

19-21 October 2009

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## Contents



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## 1. Background Situation for Renewable Energy Development in Cambodia (1/3)

- **At present, the development of RE sources in Cambodia is slow in comparing with other countries in the region, because of the lack of experiences, funds, and inadequate data in this field,**
- **Current status of RE technologies in Cambodia mainly in research development and demonstration stages,**
- **Renewable energy will reduce $CO_2$ emission and help address climate change**

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## 1. Background Situation for Renewable Energy Development in Cambodia (2/3)

### Renewable Energy Potential

- Solar Energy: the average sunshine duration of 6-9 hours per day, giving an average of 5kWh/day. thus, considerable potential of solar energy.
- Wind Energy: The southern part of the great lake Tonle Sap, the mountainous districts in the southwest and the coastal regions, such as Sihanoukville, Kampot,Kep and Koh Kong have the annual average wind speed of 5m/s or greater. The total area around 5%.
- Hydro: The potentiality of 10.000MW, but current contribution to electricity production less than 20MW.

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## 1. Background Situation for Renewable Energy Development in Cambodia (3/3)

### Renewable Energy Potential

- **Biomass:** The report prepared by NEDO on "the Assistance Project for the Establishment of an Energy Master Plan" identified significant biomass energy resources from a variety of agricultural residues such as rice husk. , acacia , Cassava Luscenia, Coconut, ..
- **Biogas:** The effectiveness of small scale biogas has been demonstrated in Cambodia by a number of different projects. The use of animal wastes to generate high quality gas for cooking has significant economic, health, social and environment benefits for poor rural households.
- **Biofuel:** Jatropha – 200 ha (Fencing), Palm Oil – 4,000 ha (recently) and can be 10, 000 ha and sugar cane 20,000 ha.

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## 2. Completed and on Going Activities Related to Renewable Energy (1/3)

- **Solar Photovoltaic:** Project with NEDO Japan, SIDA , other international and national institutions including Prime Minister project we have installed around 1.5 MW in the country.
- **Biomass Gasification:** Project with Canada in Battambang (7kw + 20kw) and with DEDE Thailand in Kompong Cham (30kw). On going project in Sambour District, Kompong Thom Province with the capacity 30kw by FONDEM France by 2009 and a number of biomass gasifiers done by local investors
- **Microhydro:** On Going Project with UNIDO capacity 65kw two units (130 kw); Grant from JICA 2 micro

## 2. Completed and on Going Activities Related to Renewable Energy (2/3)

- **Bio-fuel:** More than 10 companies doing with Jatropha, planting around 1,000 ha, no one does with large-scale yet.
- **Bio-Energy:** One company from Korea doing in this field with the production capacity of ethanol 36,000 t/year from 100,000 tons of cassava.
- The WB assists in Rural Electrification Fund (REF) by providing grant (GEF) and IDA Loan Approx. USD 12 mil. to implement the following projects:
  1- Expansion off-grid new 50,000 connections with subsidy $45/connection,
  2- Install 12,000 SHS to people in rural areas – people have to pay back all the cost during 3-5 yrs period .

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## 2. Completed and on Going Activities Related to Renewable Energy (3/3)

- The F/S LFG Power Generation Project 2 MW was submitted by Korean Company to MIME.

MIME supports this project as it is the multi-purposes project such:
- to generate electricity by using landfill gas that has been emitted to the air since 1975,
- to reduce Green House Gas, In order to participate in international effort to cope with climate change,
- to make cleaner environment In order to eliminate bad smell, fire smoke, fire, and explosion of landfill,

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NEDO Demonstration & Research Micro Hydropower- 42kw and Solar PV-80kW Hybrid System in Tuek Chhu, Kampong Cham Province

Solar PV for Bridge Lighting and Telecommunication Systems

Solar PV-BCS

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## 3. Plan for Future Renewable Energy Development

- GOAL To improve the current level of electrification and for the poverty reduction as well as enhancing education and medical treatment in the rural areas.
- PURPOSES - Study of policies to promote electrification in those areas not yet serviced
- - Introduction and development of Renewable Energy Technologies
  - Study of institution and organization for sustainable operation and maintenance supported by the appropriate business model, including the financial procurement plan.
- TARGET To achieve 100% Electrification of Rural Villages by the year 2020.

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## Framework Goals and Targets

**Goal**

- Reduce poverty level
- Improve living standard
- Foster rural economic development

Effects of RE

**Targets of Rural Electrification Sector**

(1) 100% village electrification by 2020

(2) 70% household electrification with grid-quality electricity by 2030

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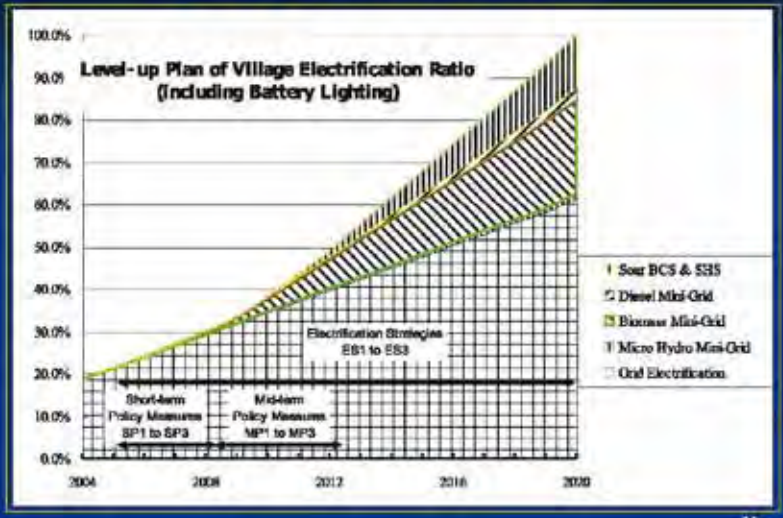
## Levels of Rural Electrification

- Three levels of electrification
  - Level 3: National Grid (grid electrification)
  - 2: Mini-grids | off-grid areas
  - 1: Battery lighting
- Use of renewable energy
  - Mini-grids: biomass and micro hydro


## Village Electrification Plan

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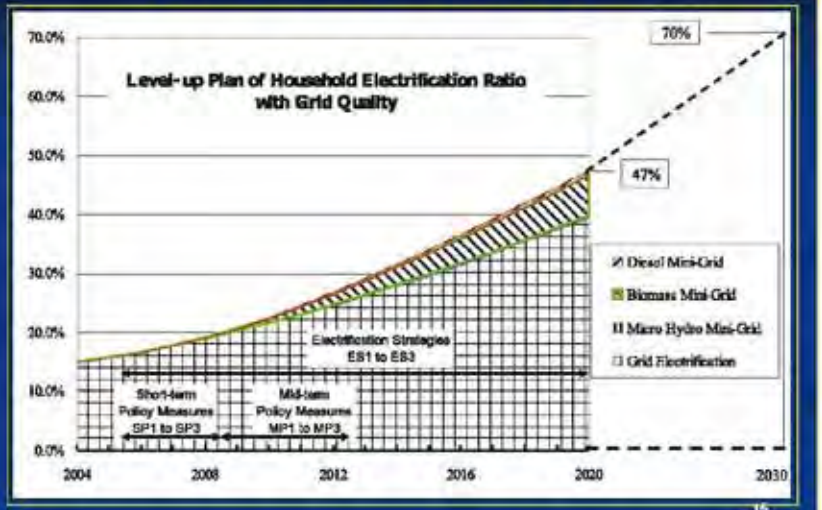
## Household Electrification Plan




15

## Candidate Energy Sources by Village

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## WB-GEF PROGRAM

### National Policy on Rural Electrification by Renewable Energy

1) endeavor to provide access to reliable, safe electricity services, with insignificant impact on the environment and at an affordable price for rural communities,
2) provide effective legal, regulatory frameworks and various to a encouragements and train the private sector to participate in providing electricity services by renewable energy in the rural areas;
3) act as a market enabler, through various incentives, for enabling equity in access to reliable and safe electricity services, with insignificant impact on the environment, at an affordable price for the rural communities;

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### National Policy on Rural Electrification by Renewable Energy (Con't)

4) encourage the efficient generation, transmission and distribution of electricity using the renewable energy technologies, through tariffs, which are in conformity with the Electricity Authority of Cambodia (EAC)'s regulations;
5) promote electricity systems by renewable energy at least cost for rural communities, through research and pilot development, as part of RGC's portfolio on grid and off-grid technologies; and
6) ensure adequate resources, appropriate institutional mechanisms and training to empower the poor involving in rural electrification to participate.

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## FINANCIAL RESOURCES (WB/GEF)

- Donations & grants and
- Other sources from the government e.g the government loans from IDA/WB

Summary of the project cost

| Type | Local (US$ M) | Foreign (US$ M) | Total (US$ M) |
|---|---|---|---|
| REE off-Grid Extension (40000 HH) | 1.82 | 4.11 | 5.93 |
| Mini hydro (6.0 MW) | 2.81 | 6.37 | 9.18 |
| SHS (12000)(GEF US$ M1.2) | 0.79 | 3.19 | 3.98 |
| Village hydro (850kw)(GEF US$M 0.30) | 0.53 | 1.25 | 1.78 |
| Sub-total REF Component | 5.95 | 14.92 | 20.87 |

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## THE PROJECT INCENTIVE

| Type | Grant proposed, US$ per household connected | Estimated total cost/unit in US$ |
|---|---|---|
| New household connected (diesel) | 45 $ | 150 $ |
| Mini hydro from 0.5 MW up to 5 MW | 400$/kW installed | 1744$/kW installed |
| Micro hydro From 50 kW up to 500 kW | 400$/kW installed | 2700$/kW installed |
| Solar Home System | 100$/set | 400$/set of 40 Wp |

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## Summary of Installed Capacity and Construction Costs (JICA)

| Energy Source | Number of villages | Number of households | Number of households to be electrified | Installed Capacity (KW) | Construction Cost (x 1,000 US$) | |
|---|---|---|---|---|---|---|
| | | | | Total | Total | Estimated cost per household |
| Grid Extension | 253 | 308,320 | 308,250 | 42,000 | 82,800 | 300 |
| Solar SHS | 1,720 | 257,370 | 190,000 | 8,487 | 52,851 | 280 |
| Individual SHS (planned by the WB) | | | 12,000 | | 4,800 | 400 |
| Mini grid: | | | | | | |
| Micro hydro | | | | | | |
| Hybrid (micro hydro and biomass gasification) | 137 | 18,341 | 14,833 | 2,078 | 14,089 | 950 |
| Biomass gasification | 3,871 | 501,856 | 804,844 | 104,644 | 342,537 | 430 |
| Grid extension or biomass gasification | 3,257 | 504,397 | | | | |
| Diesel | 393 | 69,390 | 281,011 | 37,851 | 87,383 | 300 |
| Grid extension or Diesel | 1,873 | 204,274 | | | | |
| Sub Total | 11,268 | 1,854,438 | 1,521,308 | 194,748 | 564,500 | 370 |
| Indirect costs (Sub Total x 30%) (including the administrative management, technical and operational supports, and reserves) | | | | | 169,280 | 110 |
| Total | 11,268 | 1,854,438 | 1,521,308 | 194,748 | 733,460 | 480 |

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## Bio-Fuel

- **Biofuel description:**
  - Biofuel: Liquid and gaseous fuel
  - Liquid fuel: Straight Vegetable Oils, Bio-diesel, and ethanol
- **Potential Fuel Crops:**
  - Jatropha (*Lahong kwong*) and cassava are potentially used for production of biofuel (biodiesel and ethanol, respectively).
- **Biofuel Application:**
  - Biofuels: biodiesel and ethanol (petroleum fuels)
  - Jatropha Oil biofuel: older diesel engines to generate electricity, power, and water pump



## Why Rural Electrification Enterprises Plant Jatropha and Use Jatropha Oil:

- **High Price of Diesel Oil**
- **Participated in various workshop and seminar on Jatropha**
- **Get assistance from SME Cambodia and Development Advance Technology (DATe)**

Harvesting Jatropha Fruits



## Thank You!

Contact : TOCH Sovánna
Tel/Fax: 855-17-836-927 or 855-11-959-699
E-mail:tochsovann@yahoo.com
Or tsovanna@hotmail.com

# GHG Mitigation by Low Cost Technology

**Yohanes Iwan BASKORO**
**Country Director**
**Groupe Energies Renouvelables, Environnement et Solidarités**

## Presentation Outline

- Introduction
- Background Facts
- Lessons Learnt
- Challenges
- Recommendation

## Introduction

- GERES promotes the utilization of improved cook stove (ICS) through commercialization
- Total ICS sold from June '03 – Aug '09 is 813,794 units
- ~ 450,000 families are utilizing the ICS
- GHG emission reduction from Jun '03 – Dec '07 is 308,424 ton $CO_2$ equivalent
- Based on VER: Improved efficiency in use of non renewable biomass

## the New Lao Stove

## Background Facts

- The technology costs only US$ 4 – US$ 5 per unit
- The payback period of the technology is 60 days maximum
- The durability is 2.5 years in average
- The technology is produced by 26 private micro-enterprises, distributed by 54 private distributors and retailed by more than 200 retailers
- It gives added value of US$ 450,000 per year to the supply chain

## Lessons Learnt

- Low cost technology can mitigate the emission of GHG
- Carbon fund is market-based mechanism
- It is an expert domain that requires high skills and investments
- Accessing carbon fund improves the organization's performance (audit)
- Carbon fund can balance the funding mix and permitting long term stability

## Challenges

- Excellent selection and implementation of monitoring methods
- Feasibility of small scale project to access carbon fund
- Inadequate CDM methodologies
  - Join the community of practice (Carbon SIG) and lobby the CDM framework
- Lack of visibility in carbon market
  - Buyer-seller asymmetry (JPMorgan profit in 2007 = US$ 6 Bn)

## Recommendation

- Do not do it on your own, but build an alliance with others
- Think and do business when dealing with carbon buyers
- Always think big and set a long term goal
- Be focus on carbon credit quality, think of highest standard possible
- Organization's continual improvement and perseverance

# Climate Projection and Impacts, and Vulnerability and Adaptation (V&A) in Agriculture Sector

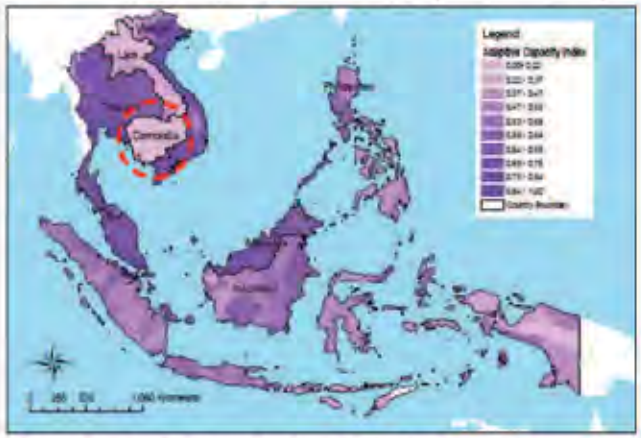
*Rizaldi Boer, Heng Chanthoeun, Agus Buono, Adi Rakhman*

**Second National Communication Under the UNFCCC**
**UNDP and KINGDOM OF CAMBODIA**
**Cambodia, MARCH 2009**

## Outline

- Introduction
- Current and Future Climate of Cambodia
- Impact and Vulnerability
- Adaptation

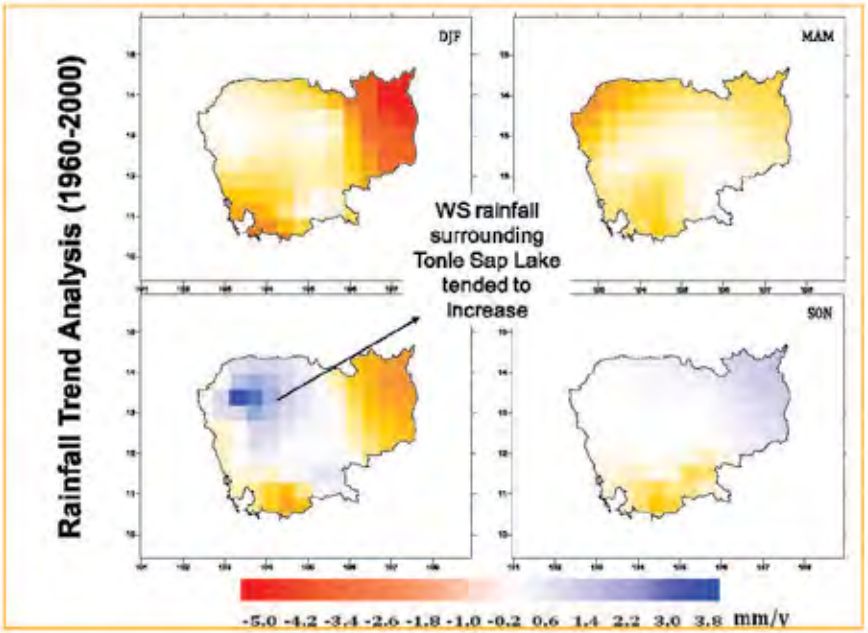
## Introduction: Among ASEAN countries, Cambodia Adaptive Capacity (function of socio-




Cambodia along with Laos has lowest Adaptive Capacity compare to other SEA member countries (Source: Yusuf and Francisco, 2009)

## Current and Future Climate of Cambodia

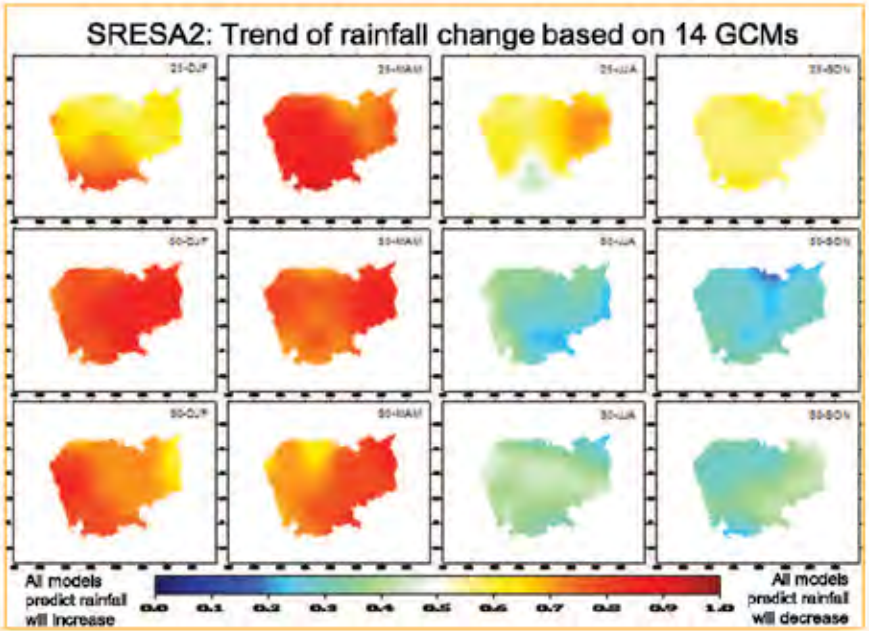
**Does Cambodian Climate Change?**

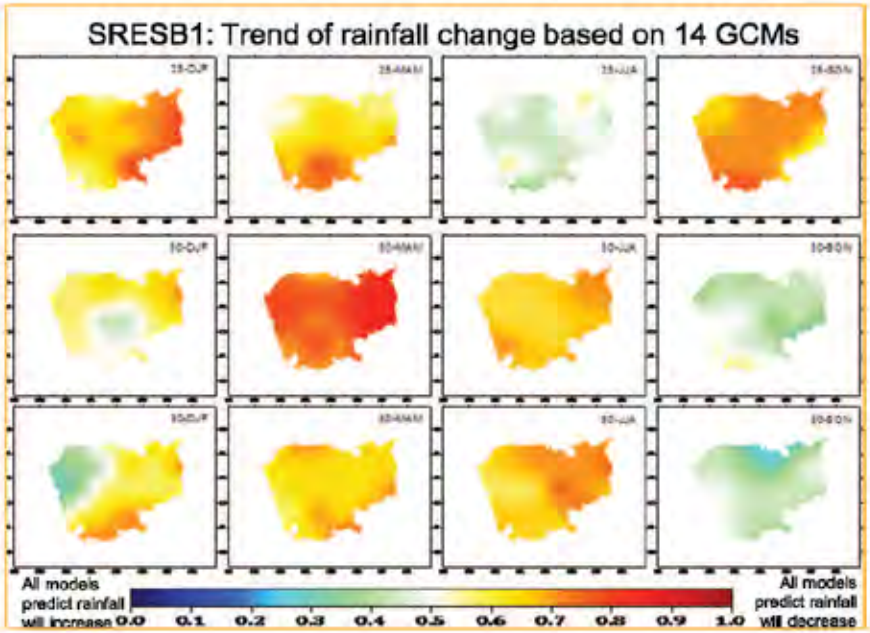



# GCMs : Resolution 1°x1°

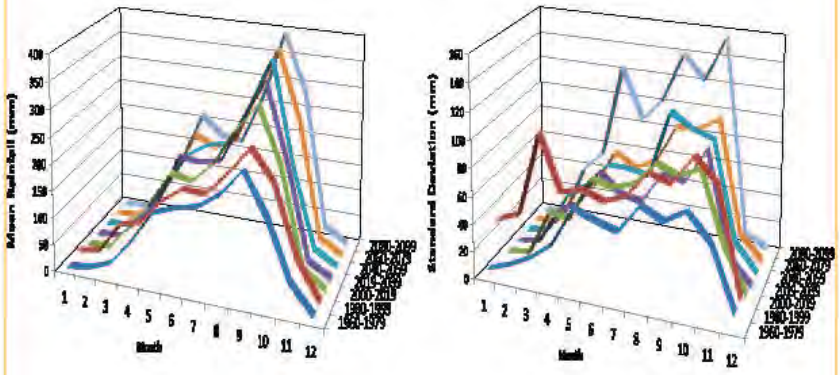
- bccr_bcm2_0
- cccma_cgcm3_1
- cnrm_cm3
- gfdl_cm2_0
- gfdl_cm2_1
- giss_model_e_r
- inmcm3_0
- ipsl_cm4
- miroc3_2_medres
- miub_echo_g
- mpi_echam5
- mri_cgcm2_3_2a
- ukmo_hadcm3
- ukmo_hadgem1

GCM Model was run by Yuji Masutomi from Climate Risk Assessment Division, Center for Global Environmental Research, National Institute for Environmental Studies, 16-2 Onogawa, Tsukuba, Ibaraki 305-8506, Japan



## Under High Emission Scenarios (A2), regional rainfall surrounding Tonle Sap Lake will continue to increase with increasing variability




Based on PRECIS Model

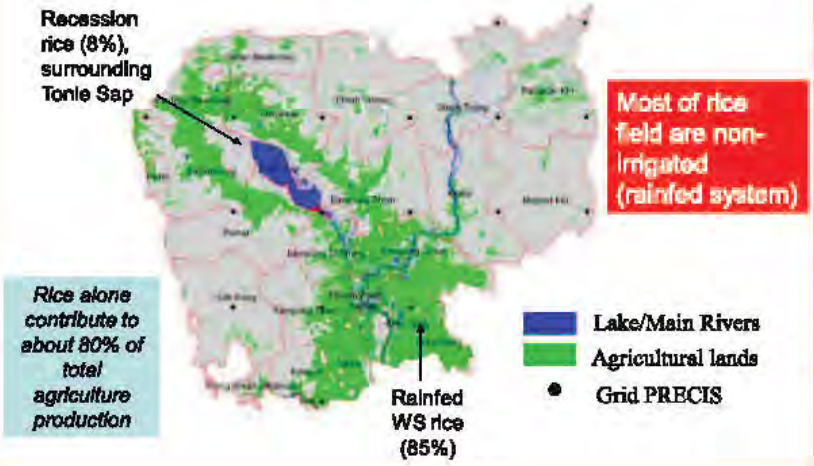
## Key message

- Under high emission scenarios (SRESA2)
  - DS rainfalls DJF and MAM will decrease with high probability and WS JJA and SON rainfall may increase but with lower probability than the DS rainfall. This suggests that the onset of rainy season may delay in the future under this emission scenario.
  - WS rainfall DJF will decrease until 2025 and then increase again in 2050 and 2080
- Under low emission scenarios (SRESB1)
  - Similar with SRESA2 DS rainfall will increase but with lower probability.
  - Different with SRESA2, WS rainfall DJF will increase in 2025 and then decrease again in 2050 and 2080
- Global community achievement in reducing GHG emission will have different implication on Cambodia

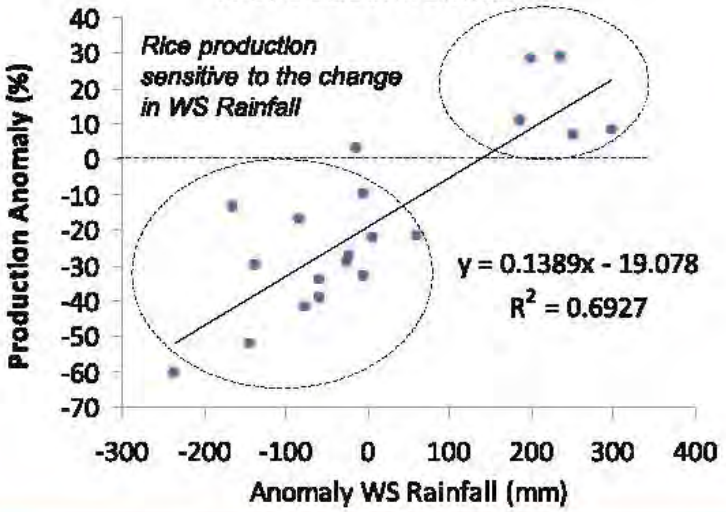
## Impact and Vulnerability

**Does Cambodian Agriculture seriously affected by climate change ?**

## Distribution of Agriculture Land in Cambodia in 2008

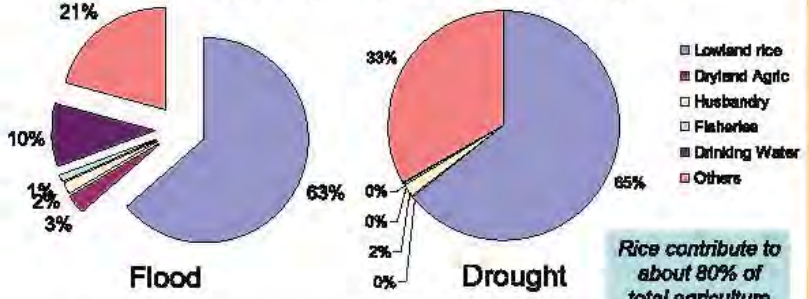


## Cambodian rice production depends on Wet Season rainfall




## Vulnerable sub-sector in Agriculture to climate hazards

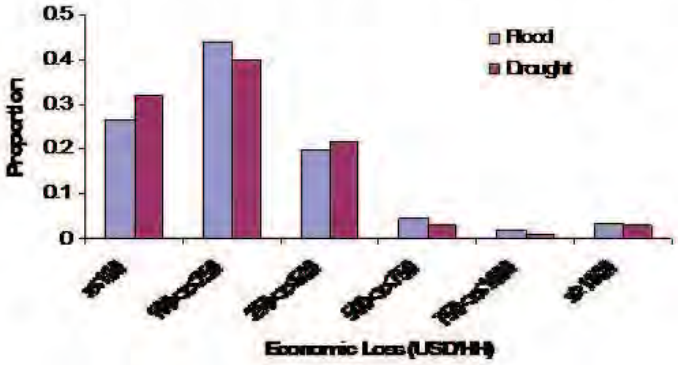
Based on Survey at Prey Veng, the most vulnerable province to climate hazards, rice farming is the most vulnerable sub-sector to climate hazards




Based on interview with 417 respondents

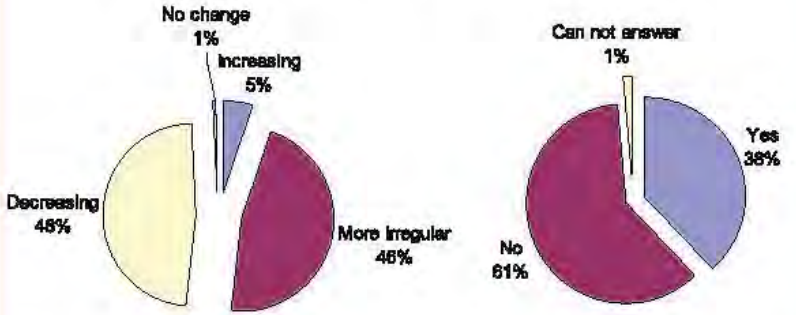
*Rice contribute to about 80% of total agriculture commodities production*

## Economic Lost from Rice Crops due Flood and Drought Hazard




Based on Survey at Prey Veng Province

## Farmers perception on change in drought and flood severity?



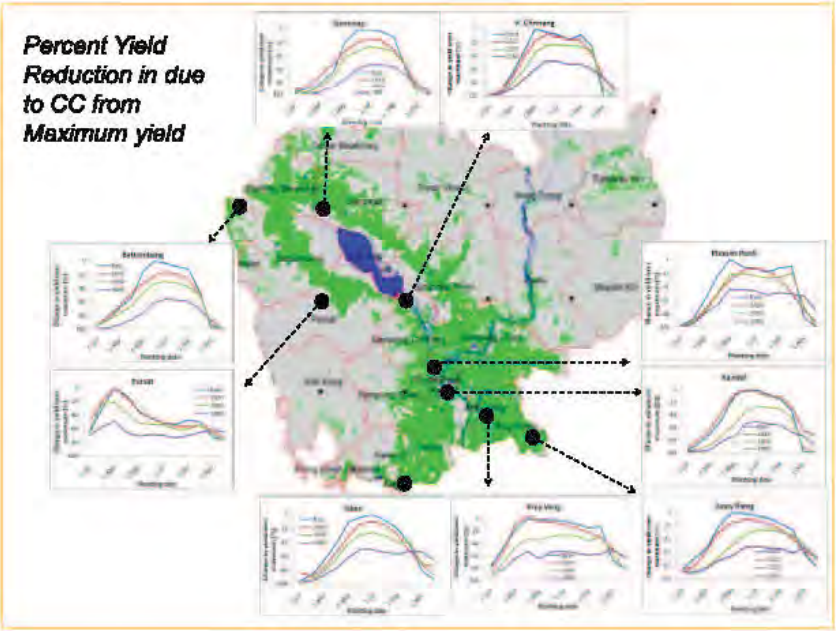

Flood frequency and intensity

Drought severity increase?

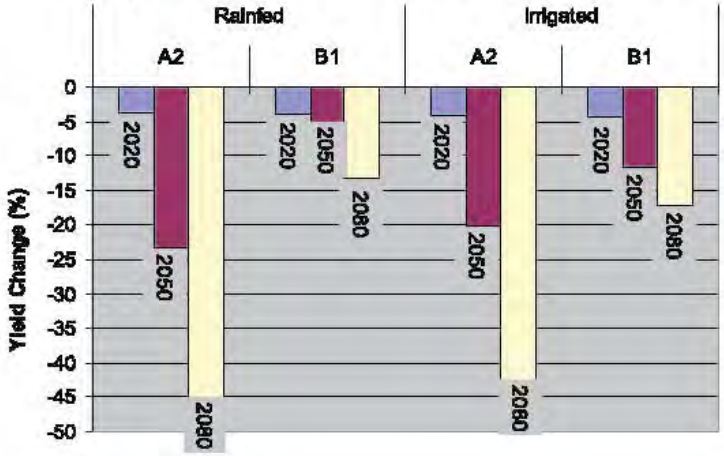
Based on Survey at Prey Veng Province

# How CV and CC will affect Agriculture?

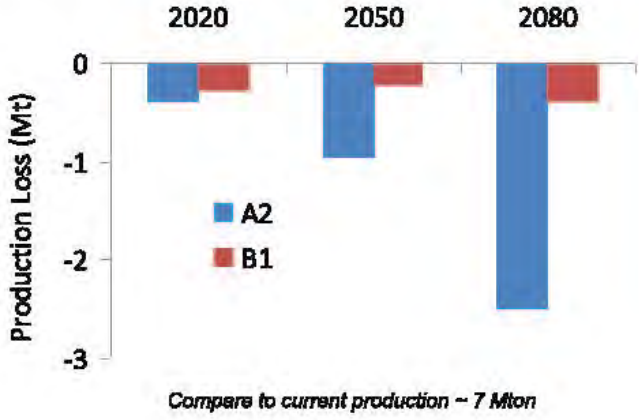
- The increase in future rainfall variability will have two direct impact on agriculture production:
  - Affect yield variability
  - Increase crop production loss due to the increase in frequency and intensity of extreme climate events




# Impact of CC on Rice Yield




# Production Loss due to CC




*Compare to current production ~ 7 Mton*

## Key Messages

- Rice production of Cambodia is sensitive to the change in wet season rainfall
- Rice farming system might be exposed to higher flood and drought risks in the future
- Impact of climate change on rice production will be much less under low emission than high emission scenarios

**ADAPTATION**

**What we should do to increase agriculture resilience to CV and CC**

## Two Strategies for CC Adaptation

- ***Short term strategy*** is to increase coping capacity of system to current climate risks through the improvement of climate risk management and community livelihood and at the same time contribute to the reduction of GHG emission
- ***Long term strategy*** should be directed to increase the resilience of the system to future climate risks through the revitalization of development programs

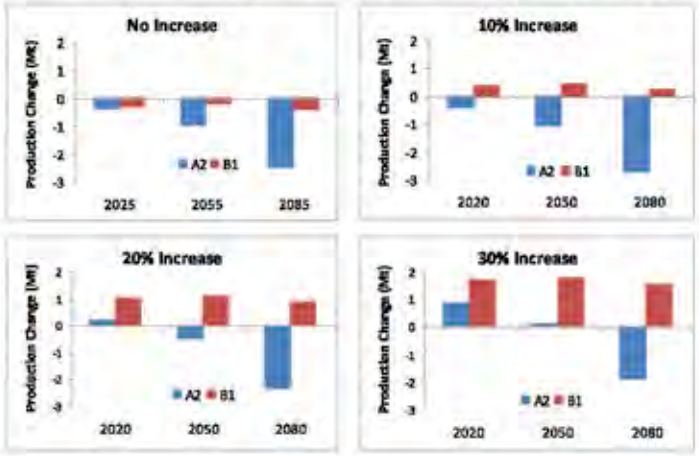
## Revitalization of Current Programs

- Engage policy makers to evaluate current programs for addressing climate risks based on V&A assessments and design pilot projects (e.g. NAPA), activities and research agenda that can be used to redesign, enhance or revitalize the current programs to address current and future climate risks.

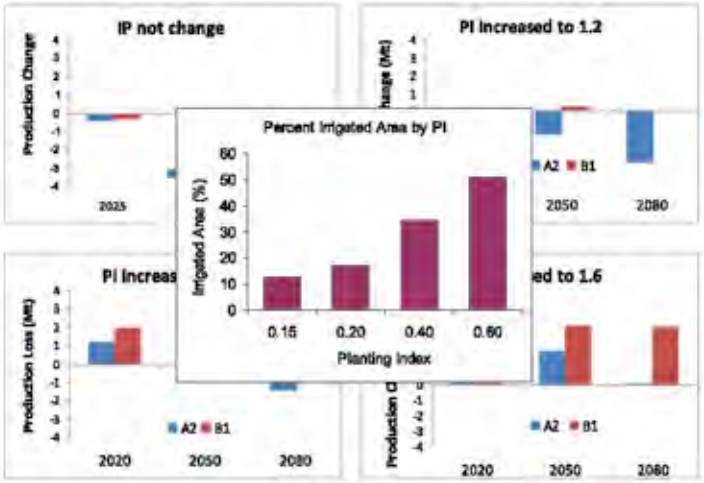
# Example of Adaptation

- Develop long term strategy for
  - Improvement of rice productivity
  - Establishment of irrigation facilities to increase planting index
  - Expanding new rice planting area to low risk area
- Impact of the implementation of the strategies
  - Rice productivity: increased by 10%, 20% and 30% from current level
  - Increase planting index from 1.15 to 1.20, 1.40 and 1.60
  - New rice planting area (18,000 ha; 27,000 ha; 36,000 ha per year)

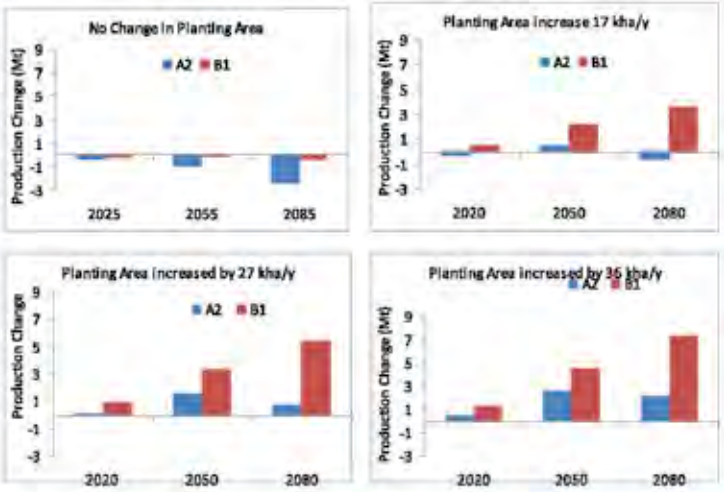
# Increasing Crop Productivity




# Increasing Planting Index




# Increasing Planting Area



# Key Messages

- Production loss due to climate change can be compensated among others by increasing crop productivity, planting index, new planting areas.


Dr. Rizaldi Boer is a teaching staff at the Department of Geophysics and Meteorology and Director of the Centre for Climate Risk and Opportunity Management (CCROM) of the Bogor Agricultural University in Indonesia for the period of 2009-2013.
He received his PhD from the University of Sydney in 1994.
Since 1995 he actively involves in many regional research activities related to climate variability and climate change. He is now also a member of Task Force Bureau of the IPCC for the GHG Inventory. Since 2001, he is frequently invited by the UNFCCC secretariat to be part of expert review team of the National GHG Inventory of Annex 1 countries.

# Climate Change and Human Health

## Risks and Responses: Vulnerability and Adaptation

National Forum on Climate Change
19-21 October 2009, Phnom Penh

**A.J. McMichael**
WHO Consultant
National Centre for Epidemiology and Population Health
The Australian National University
Canberra, Australia

## Vulnerability and Adaptation Assessment for Human Health, Cambodia

Climate Change and Health Workshop: multisectoral
**Ministry of Health, Phnom Penh, April 26-28, 2009**

Interim Follow-up Visit by ANU/Canberra team
**August 3-7, 2009**

Develop *National Action Plan for Climate Change and Health*, based on a Vulnerability and Adaptation Assessment

**Ongoing Consultations with local experts**
**Literature review, expert opinion, 'problem tree' approach → best adaptation options**

Report drafting: jointly
**Important to 'mainstream' health**

Report Submission
**October 2009**

## Cambodia Project Summary: CC-related Health Risks

- **Vulnerability is high:**
  - **High Exposure levels:** changes in monsoon, floods, droughts, storms
  - **High Sensitivity:** large, agriculture-dependent, populations living near river systems; limited health infrastructure; social inequities
  - **Low Adaptive Capacity:** Limited by poverty, education, traditional technologies, limited current collaboration between health and other public sectors
- **Risks greatest for climate-sensitive health outcomes**
  - **Vector-borne disease** – eg, malaria, dengue fever
  - **Malnutrition (and impaired child devt)** due to food insecurity/shortage
  - **Food and water-borne infectious diseases**
  - **Impacts of extreme weather events:** injury, death, disease, mental health
- **Need, now, to design and implement adaptation strategies**
  - Good strategies reduce **current** and **future** climate-sensitive disease – "Win Win"
  - **Align projects** with existing programs/priorities; **strengthen current public health actions**
  - **Mainstream** climate-related health risks into planning by every sector

## Climate Change (CC), Monsoons and Human Wellbeing/Health

- **South Asian summer monsoon** contributes up to 75% of total annual rainfall in much of the region
- Projected CC changes in this monsoon will affect human health, ecosystems, agriculture and already-stressed natural resources.
  - e.g., farm production, rural livelihoods, water availability, hydroelectric power generation

Ashfaq et al, *Geophysical Research Letters*, 2009

ANU

# Outline of Central Argument

## Population Health is At Risk
## Health Impairment represents an 'Alarm Bell'

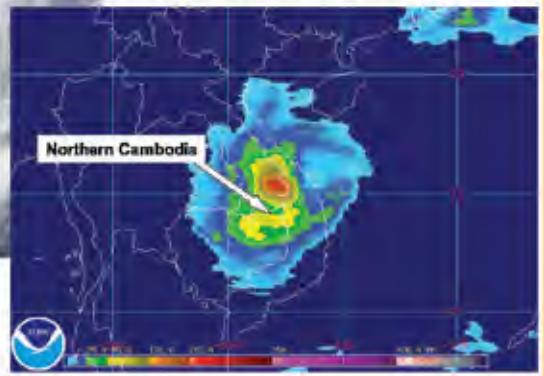
- Human-driven climate change (CC) is happening
- Physical, biological, social systems are being affected
  - … and that affects food yields, water flows, infectious agents, physical safety, social stability
- Those impacts affect human health/survival*
- Health risks are not mere 'collateral damage' – they are our strongest signal that CC is potentially serious

* Many examples are now emerging around the world: Trends in heatwave impacts, increases in weather disasters, extensions of some infectious diseases, apparent regional impacts on food yields (e.g. Africa), coastal/island communities' anxieties and displacement (mental health)

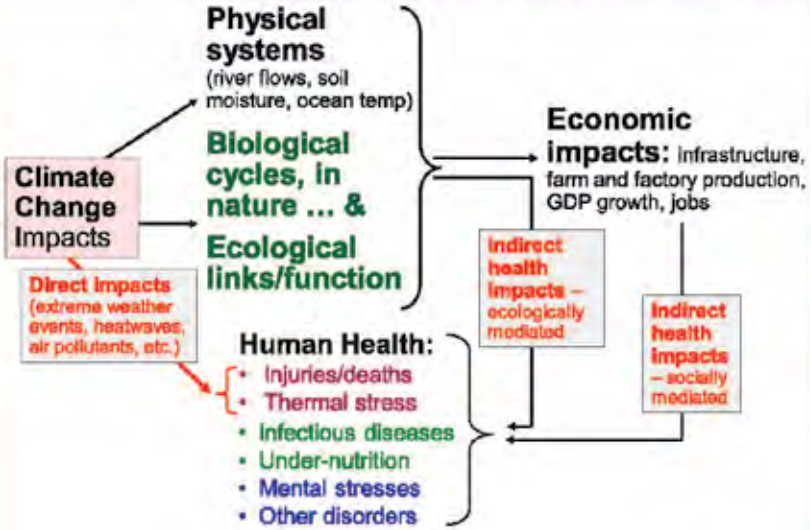
## Cyclone Ketsana

Approaching Vietnam

Rainfall estimates, NOAA(USA), Sept 29

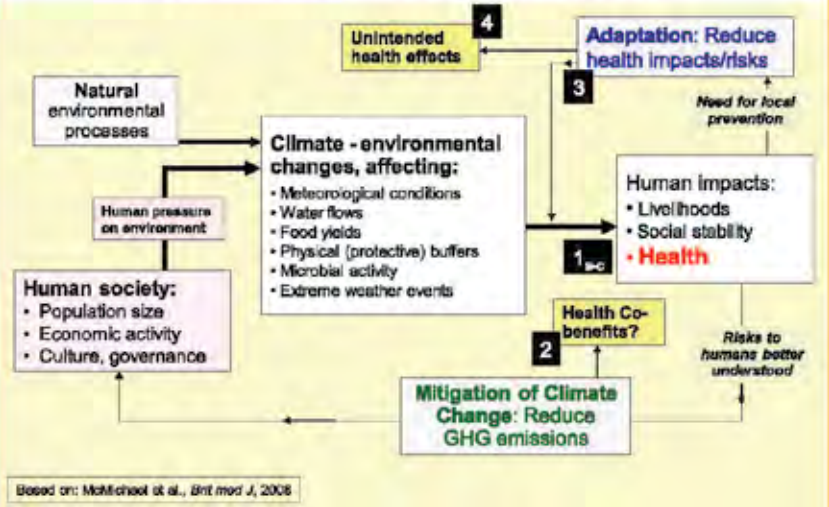



# Climate Change: Health Impact Pathways




# Climate Change and Health

## Research Tasks and Policy Foci



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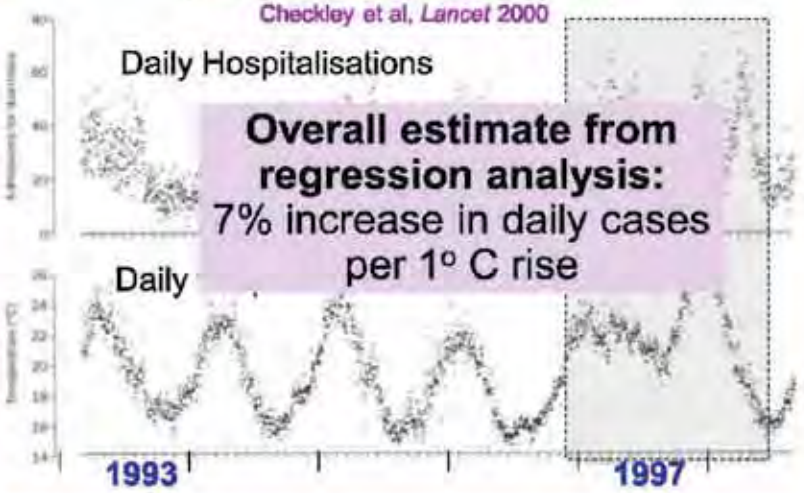
## Daily hospitalizations for diarrhoea, by daily temperature: Lima, Peru.

(Shaded region is 1997-98 El Niño event)

Checkley et al, *Lancet* 2000




**Overall estimate from regression analysis:**
7% increase in daily cases per 1° C rise

## Mortality Impacts of Climate Change: Year 2000

Estimated annual deaths due to climate change: malnutrition (~80K), diarrhoea (~50K), malaria (~20K), flooding (~3K)

14 WHO regions scaled according to estimated annual death rates due to the change in climate since c.1970.

(Patz, Gibbs et al, 2007: based on McMichael, Campbell-Lendrum, et al, 2004)

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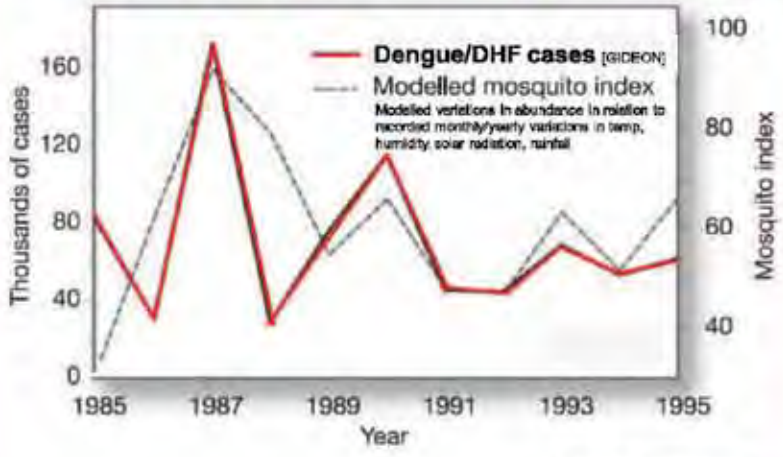
## Thailand: Modelled climate-related abundance of *A. aegypti* mosquito in relation to recorded cases of Dengue/DHF




Patz et al., *Nature* 2005

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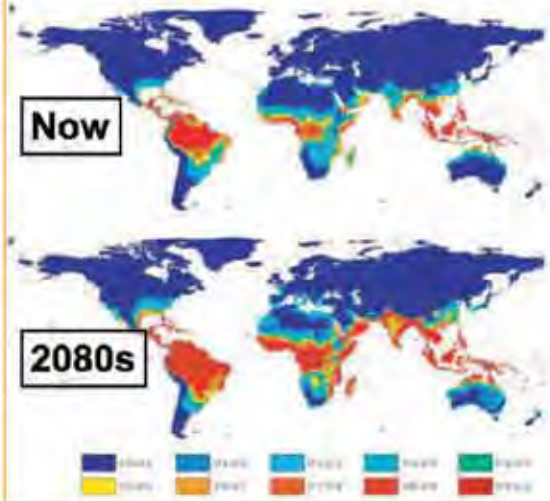
## Modelling how future climate change may increase health risks .... e.g. Dengue Fever




Climate change, by 2085, may increase the proportion of global population exposed to dengue from c.35% to 50-60%.

Hales et al, *Lancet*, 2002

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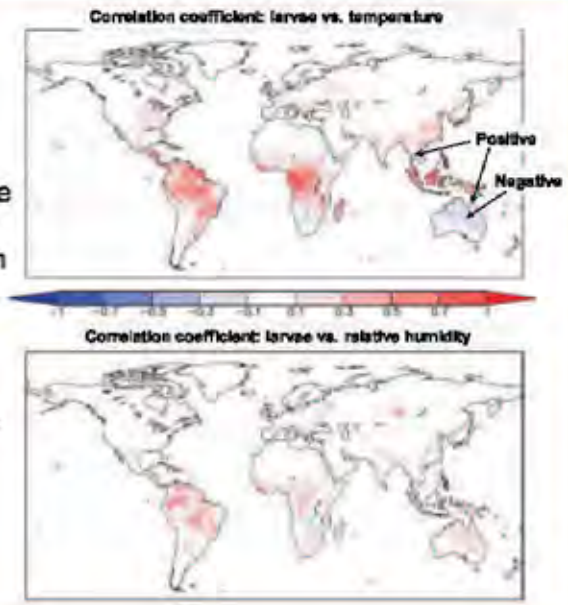
## Climate and Dengue

Relative importance of several climatic variables in relation to *A. aegypti* breeding (larvae), 1958-1995

Hopp & Foley, *Climate Research*, 2003

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## National Health Vulnerability Assessment
### Main Questions

What are (likely) important climate-sensitive health problems?

— Criteria for ranking these?

For each problem, is exposure-response relationship known?

What is nature of climate-related 'exposure': now/future?

— Are national/sub-national CC scenarios available?

Which groups/regions are (likely to be) most exposed?

What is 'core' adaptive capacity of specified population/group?

What is their adaptive capacity?

What, therefore, is their health vulnerability?

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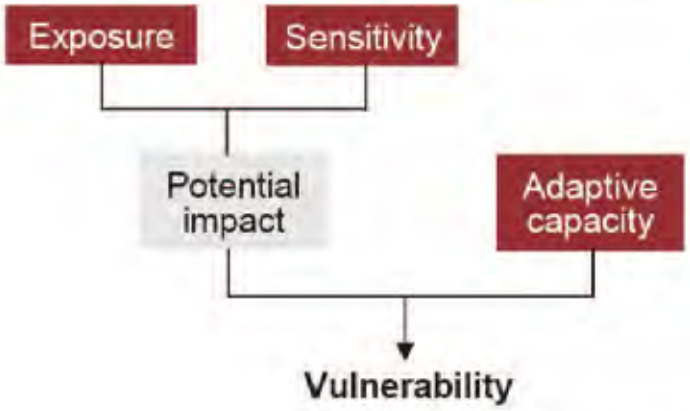
## 'Vulnerability' and 'Adaptation'




D Schroter et al, 2004

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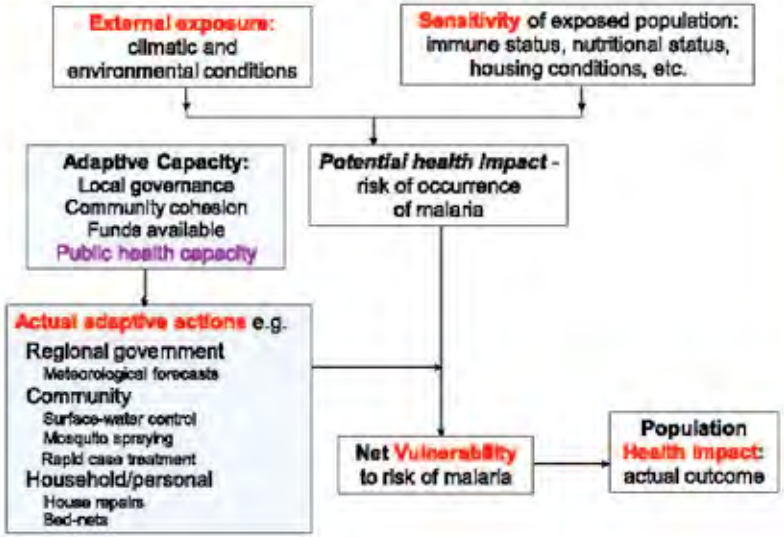
## Vulnerability, Adaptation and Malaria Risk



# Project's Recommended Adaptation Options

## Example: Malaria in Cambodia

- **Project 1:** Surveillance of *Anopheles* mosquitoes; study regional relationship of mosquito to climate
- **Project 2:** Focus on Village Malaria Workers to improve education and treatment of malaria in rural areas
- **Project 3:** Provide long-lasting impregnation of bed nets and residual spraying of houses

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## Public Health Perspective on Adaptation

from 'primary' to 'tertiary' prevention

**Reduce exposures [primary] …. e.g.**

- Legislative policies, regulations
- Improvements to built or natural environment

**Prevent onset of adverse outcomes [secondary]**

- Early warning systems
- Surveillance
- Vector control programs
- Public education and outreach

**Improve response and treatment [tertiary]**

- Emergency response to extreme events
- Early detection/treatment of affected persons

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World Health Organization
Western Pacific Region

# END

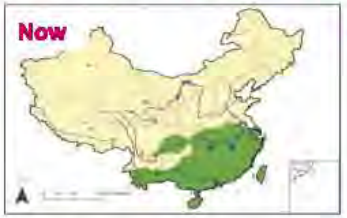
## Thank you for the opportunity to speak to you (and to do this important project with you)

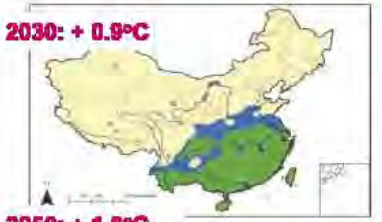
The views expressed in this presentation are those of the author and do not necessarily represent the decisions or stated policy of the World Health Organization.

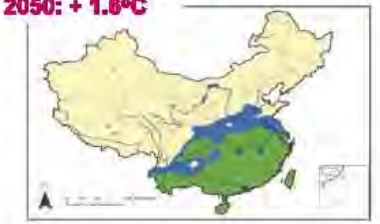
## National Health Vulnerability Assessment
### Summary of Process

- Resource needs, time-frame – to be agreed
- Researchers/assessors, policy-makers, topic-experts, and other stakeholders meet to review task
  - WHO (regional) advisors may be available
- Action: literature review → scoping document, data gathering
  - Define criteria and methods for: (I) assessing 'adaptive capacity', (II) identifying high-vulnerability groups/regions
- Propose priorities and implementation methods for national adaptive strategy → Climate Change Action Plan for Health

## Schistosomiasis: Modelling of Future Impact of Climate Change on *S. japonicum* Transmission in China




**"Recent data suggest that schistosomiasis is re-emerging in some settings [that had previous successful disease control]. ....**

**"…. climate change and ecologic transformations have been suggested as the underlying causes."**

Source: Zhou et al., Potential Impact of Climate Change on Schistosomiasis Transmission in China *Am J Trop Med Hyg* 2008;78:188–194.

# Climate change vulnerability and adaptation in the fisheries sector

**Dr Edward H Allison**

**The WorldFish Center**
**Penang, Malaysia**

With thanks to: WorldFish Center, Phnom Penh

## Outline

1. Regional and national importance of fisheries
2. Climate change impact pathways
3. Climate change vulnerability assessments
4. Adapting fisheries and aquaculture to climate change
   - I. Regional experiences in adaptation
   - II. Challenges – other drivers, effects of adaptation in other sectors, knowledge gaps
   - III. Policies to enable adaptation
5. Recommendations

## 1.1 Mekong fisheries: importance to economy, rural society and food security

Baran E., Jantunen T. and Chong C. K. 2007 Values of inland fisheries in the Mekong River Basin. WorldFish Center, Phnom Penh, Cambodia.

- Fish production = 2.6 million tonnes per year
- Value: more than USD 2 billion at first sale
- Economic multiplier – processing, services, trade, livelihoods
- Food/nutritional security contribution:

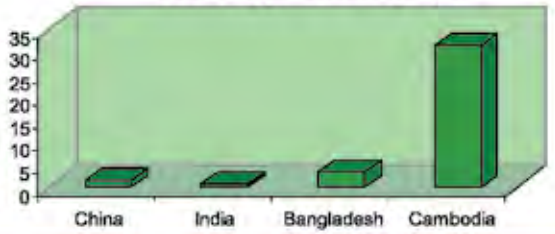
| *grams/person/day* | Cambodia | Lao PDR | Thailand | Viet Nam | Average |
|---|---|---|---|---|---|
| Inland fish | 88 | 67 | 68 | 95 | 80 |
| Other aquatic animals | 12 | 11 | 12 | 12 | 12 |
| Total inland fish and OAAs | 101 | 78 | 79 | 107 | 91 |

Animal protein intake = more than 50% from aquatic animals

## 1.2 Fish Production In Cambodia

- Cambodian capture fish production in recent decades: 300 000 – 450 000 tonnes/year (<10% marine, >60 % from Tonle Sap)
- Aquaculture - 33,500 tonnes in 2006, growing rapidly
- Cambodia's freshwater capture fisheries rank 4th in tonnage after China, India and Bangladesh
- The catch per inhabitant and per year makes it the most intensive inland fishery in the world

*Catch in kg per inhabitant per year*



## 1.3 Economic Contributions of Cambodian fisheries

- Fisheries contribute 8 - 12% to Cambodia's GDP, USD 469 million in 2004
- Prices increase 3 – 5 times between fishers and local consumers

- 90% of Cambodian households have access to common property resources
- 80% of HH use big rivers, floodplains and lakes for fishing and irrigation

Kurien, J, So, N. and Mao, S.O. 2006. Cambodia's Aquarian Reforms. Inland Fisheries Research and Development Institute, Phnom Penh, Cambodia.

## 1.4. Fish and nutritional security in Cambodia

Average per capita consumption: 36.5 kg of fish and other aquatic animals per per year;

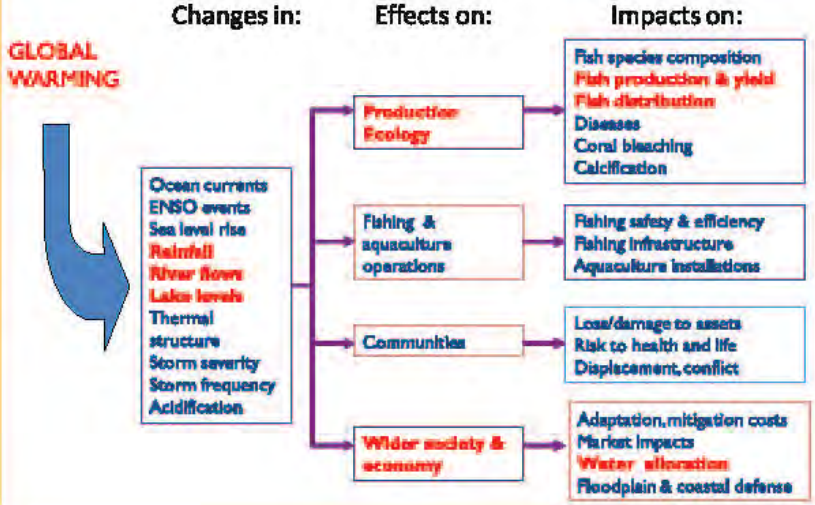
- 100 grams of fish per Cambodian each day of the year
- 3 x the consumption of pork and 20 x the consumption of chicken

Fish provide 65% to 79% of the animal protein requirements in Cambodia

Processed inland fish commodities (fish sauce, *prahoc*, etc) are worth USD 23.7 to 29.4 million per year.

In 2003, *prahoc* was worth USD 0.09 per kg – cheaper than pork or chicken

## 2. Climate change impact pathways

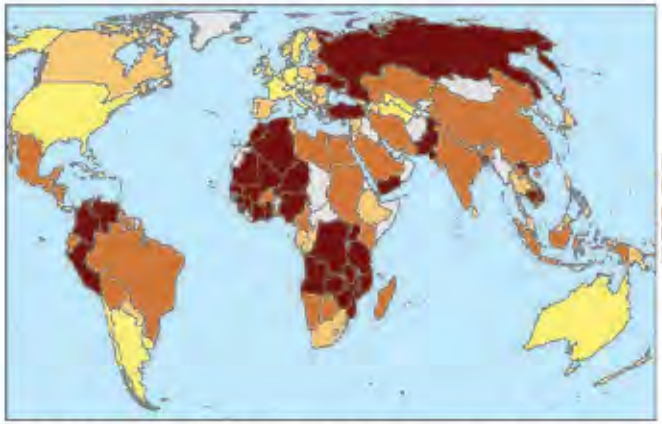



## 3. Vulnerability of fisheries and aquaculture to climate change

***Vulnerability:*** a function of exposure, sensitivity and adaptive capacity

***Multiple scales:*** global/national, (eco)regional, local

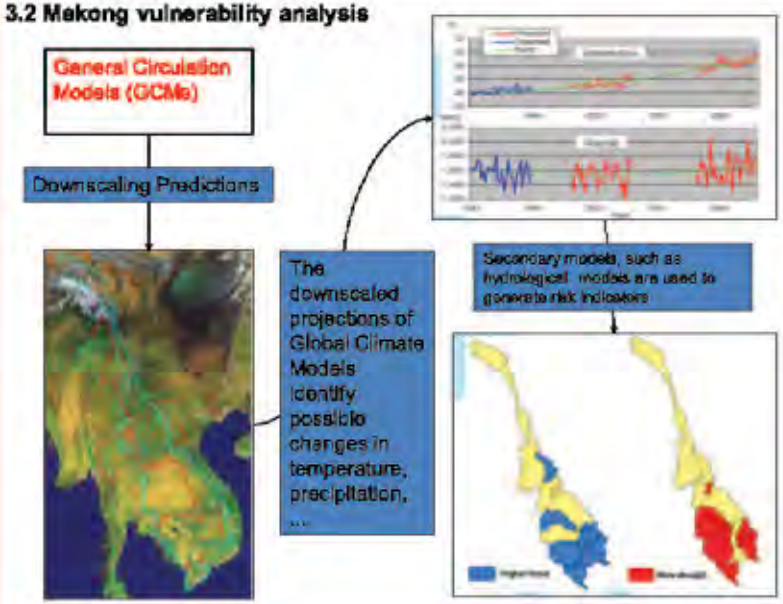
***Aim of vulnerability analysis***: to identify vulnerability 'hotspots' (people, places, value chains...) to target adaptation investments



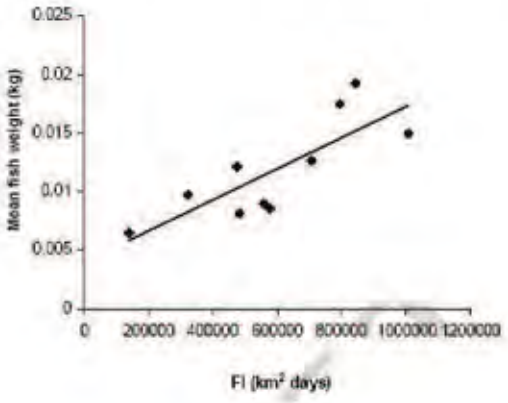

3.1 Vulnerability of national economies to the impacts of climate change on the fisheries sector.

Out of 132 countries Cambodia (30) is among the most vulnerable quartile. (Allison et al. 2009, Fish and Fisheries 10)

**3.2 Mekong vulnerability analysis**




**3.3 Floodplain index explains variations in size of fish caught in the Cambodian bagnet fishery** (Halls et al 2009, MRC)




## 4. Adapting fisheries and aquaculture to climate change: key principles

- Building on existing adaptation to climate variability – diverse livelihoods, institutions enabling mobility, assets with high liquidity
- Supporting existing pro-poor rural development initiatives AND sustainable fishing policies - a 'no regrets' strategy
- Prioritising additional climate-specific actions at local level using a participatory diagnostic approach

## 4.3 Building adaptive capacity - Mekong region

- Integrating fisheries into local **agro-ecosystem analysis** for improved water allocation
- Supporting **community-based fish culture**
- Raising productivity of rice and fish through **Integrated Agriculture-Aquaculture** farming systems
- Optimizing **water harvesting** for pond aquaculture operations in flood plains
- **Managing conflict** associated with water allocation and water quality in the Mekong Delta

## 4.5. Fishery sector adaptation in Cambodia

**Adaptation measures proposed in 2006 NAPA are mostly about:**

- increasing water management capacity;
- stocking reservoirs and ponds for aquaculture;
- protection of coastal areas

**Additional need for responses to:**

- Infrastructure development upstream - threat more immediate than climate change, but the effects will be linked
- Invest in fisheries forecasting and management in the context of predicted changes in flow regime

## Knowledge needs for planned adaptation

- **Develop improved climate modeling** in coastal areas and at river basin levels. For inland fisheries, focus on flow and lake level as key drivers of fishery systems
- **Develop indicators** of current adaptive capacity and vulnerabilities and **identify the most vulnerable** people, regions and sub-sectors.
- **Identify and test options** for better management and adaptation – e.g. Low-cost netting to prevent stock loss from floods in aquaculture.
- **Analyze cost-benefits and trade-offs** between productive activities (e.g. rice and fish) – to retain resilience to climate change
- **Facilitate capacity building, dialogue and planning** with stakeholders
- **Identify other drivers** of social-ecological change through participatory scenario development

## Management recommendations

- Utilize co-management and a broad ecosystem-based approach to obtain healthy fish stocks and fish habitats
- Reduce fishing pressure on habitats critical for maintaining climate-related ecosystem services (e.g. floodplain forests, mangroves)
- Design infrastructure and technologies for aquaculture and other coastal livelihood activities that are 'climate proofed'.
- Manage access to coastal and floodplain resources in an integrated way to help sustain diversified livelihoods and reduce dependence on fisheries

## Policy recommendations

- Include adaptation plans for fisheries and aquaculture in National Plans of Adaptation to Climate Change
- Integrate fishing-dependent communities into national and decentralized economic planning (e.g. PRSP)
- Incorporate the fisheries sector in disaster response planning.
- Develop policies that help secure fish supplies through a combination of well-managed capture fisheries, sustainable aquaculture, and facilitating imports where necessary.
- Maintain a policy environment conducive to the pursuit of diverse, adaptive livelihood strategies (e.g. avoiding commodity and market taxes, sectoral approaches to rural development)

# Financing for Climate Action in Developing Countries

First National Forum on Climate Change
October 19-21 2009
Phnom Penh, Cambodia

Oxfam

## Outline of presentation

- Why is adaptation funding needed?
- What scale of public finance is required?
- What are some near- term financing for adaptation?
- What are the sources to generate public finance?
- What are the sources to generate private finance?
- What are some principles to govern adaptation financing?

Oxfam

## Why is adaptation finance needed?

- Climate change is already slowing progress towards the 2015 Millennium Development Goal (MDG) targets.
- Poorest countries lack the resources to implement adaptation programs
- Even if a deal is reached to limit warming to 2°C – still leaves poor people to cope with 1.2°C of further warming.
- Long-term impacts of immediate climate risks.

Oxfam

## Why is adaptation finance needed?

- Developing countries need predictable flows of finance to contribute to global mitigation actions.
- Builds trust that developed countries are serious about tackling climate change.

Oxfam

## Why is adaptation finance needed?

- Critical for providing incentives that are required for strategic investments that will have long-term returns, like innovative adaptation and clean energy technologies
- Public investment needed given the limited initial investment from private sector sources.
- Investment can generate economic growth and stabilize the private sector during periods such as the recent financial crisis.

Oxfam

## Scale of funding required for adaptation?

Estimates range from $15bn to $100bn over various time frames.

- Oxfam (2007) – more than $50bn immediately
- Africa Group (2009) - $67bn by 2020
- UNFCCC (2007) – $28-67bn by 2030
- World Bank (2009) - $75-100 bn per year 2010-2050

*Unrealistic numbers?*
*Earlier this year, $150bn was spent to bail out a single US bank (AIG).*

Oxfam

## Scale of funding required for adaptation?

- Adaptation cost estimates continue to increase and probably underestimate full needs.
  - Ignore the costs of adaptation in some sectors (ecosystems, energy, manufacturing, retail and tourism)
  - Those sectors that are included, estimates ignore the costs of addressing pre-existing levels of vulnerability
  - For the modelled sectors, including these costs results in a total adaptation finance requirement two to three times greater than the UNFCCC estimates

Oxfam

## Why is additionality so important?

- What can $50bn of development aid do?
  - $25bn per year could ensure treatment for 8.8 million people with HIV and AIDS in 2010;
  - $5.2bn per year could save the lives of 2 million mothers in 2010;
  - $5.6bn per year could save the lives of 2.5 million children in 2010;
  - $13bn per year could ensure universal primary education – an extra 75 million children in school in 2010.
- If ODA is cannibalised to provide $50bn per annum for adaptation, we lose these development gains.
- Adaptation money must be additional to ODA.

Oxfam

## Costs of mitigation in developing countries

- Oxfam estimates additional costs of mitigation in developing countries to be a **minimum** of $100 billion (c.€70 billion) per year by 2020

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## Near-Term (2010-2012) Financing for Adaptation

- **Developed countries should agree to provide near term financing starting from 2010-2012 if there is a global deal in place by 2012 to deliver longer term financing**
- **Near term financing should include $2 billion for the Least Developed Countries Fund**
- **Fulfills an eight-year old promise to fully fund urgent and immediate adaptation needs of least developed countries as spelled out in their National Adaptation Programs of Actions (NAPAs).**

Oxfam

## Near-Term (2010-2012) Financing for Adaptation

- **Funding would enable urgent actions and pilot adaptation measures in vulnerable developing countries to do:**
  - **Institutional capacity building,**
  - **knowledge generation,**
  - **vulnerability assessments and differentiated impacts of climate change on women, men, children**
  - **enhancing in-country processes for transparent and participatory adaptation planning and implementation**

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## Sources of Public Finance

- **Various innovative sources for public finance can be implemented to mobilize predictable, guaranteed, and additional funds at the scale needed.**
- **Commitments must be legally binding within the formal Copenhagen agreement.**
- **Essential to establish innovative sources of finance at the international level because of the unpredictability of national-level budget processes.**

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## Sources of Public Finance

Innovative sources of funding include:

- **Auctioning international and or domestic Emission Allowances**
  - **Auctioning Domestic Emission Allowances**
- **International Aviation and Shipping Mechanisms**
- **International Assessments**

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## Private Financial Flows

- Private finance flows are an important supplement to public finance.
- But we must ensure that private finance flows are not double counted.
  - Some developed countries want to count finance for offset projects towards their international finance obligation under the post-2012 climate regime.
  - Financing for offsets should only be to achieve developed countries own mitigation commitments.

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## Key Issues on the governance of financial flows

- *Voice*: The poorest countries need to have a voice in the disbursement of funds.
  - Inclusion of communities in development and implementation of adaptation plans
  - Gender-balanced participation
  - Prioritization of vulnerable groups
  - Enhancing capacity of women to act/be agents for change
  - Gender equality in disbursement and implementation

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## Key Issues on the governance of financial flows

- *Accountability*: Under the authority and accountable to the COP.
  - ensure greater accountability (both to contributors and recipients), coherence, and transparency.
- *Trust*: COP oversight of the climate fund policies and safeguards can build the political acceptance necessary to seal a global deal.

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## Key issues on the governance of financial flows

Existing channels for aid are inappropriate because:

climate finance is not aid;

developing countries are not adequately represented in aid governance;

current architecture for aid delivery is highly fragmented.

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## Thank you

Oxfam

First Climate Change Forum Cambodia
19-21 October 2009 , Phnom Penh

# Towards the Low Carbon Society

## UN ESCAP works with AP Developing countries via Green Growth

Masakazu Ichimura
Chief, Environment and Development Policy Section

UNITED NATIONS ESCAP

## Outline

I. Introduction
II. Purpose of this Presentation
III. Substance
   1. Challenges of AP Developing Countries
   2. Green Growth – A key approach
   3. How ESCAOP can help?
IV. Conclusion

## Introduction

- UN Economic and Social Commission for Asia and the Pacific

= Biggest Regional Arm of UN Secretariat in AP region
characterized by
Analytical and Normative Work and Convening Power

| *Analytical + Normative W* | *Convening Power* |
|---|---|
| Socio-economic Development Think Tank with multi-disciplinary expertise<br>Standard Setting for New Policy Direction at Regional Level | Provide Socio-economic development fora<br>(Intergovernmental and multi-ministerial, and/or multi-stakeholder)<br>UN Interagency Coordination |

- Altogether, promotes sustainable economic and social development in the region, thru
Regional Cooperation

## Purpose of This Presentation

a) To demonstrate Low Carbon Development as a necessary, but feasible and practical option
b) To highlight areas for key policy interventions
c) To identify support for formulating national actions and steps forward

## Asia-Pacific socio-economic challenges

### 1. Poverty

People under poverty line in Asia and the Pacific

Under $1(PPP) a day →
641 million

Under $1.25 (PPP) a day

912 million, 66.4 % of the world poor (1,374 million)

Under $2 (PPP) a day

1,821 million, 71% of the world poor (2,564 million)

## Asia-Pacific socio-economic challenges

### 2. Health

- 4 million children die before age of 5
- Maternal mortality: 300 deaths per 100,000 live births

### 3. Access to services

- 400 million urban residents without access to sanitation
- 566 million rural residents without access to clean water
- 800 million without electricity

Source: ESCAP, ADB, UNDP (2008) "A future within reach"

## Asia-Pacific Environmental Challenge

Asia-Pacific is already living above its 'environmental means': Despite its relatively low-impact consumption patterns, its carrying capacity is already being exceeded
(ESCAP State of the Environment Report 2005)

**LIMITED CARRYING CAPACITY**

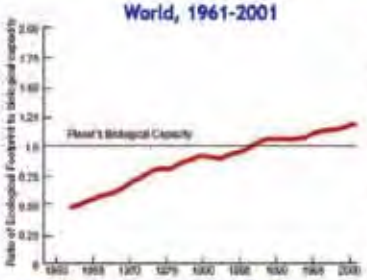
- Population density 1 ½ times the global average
- Freshwater available: 3,920m3/cap/yr vs. South America 38,300m3.cap/yr.
- Productive area available per capita: 60 % of the global average
- Arable land per capita: 80 % of the global average

- Signs of Environmental Degradation everywhere!

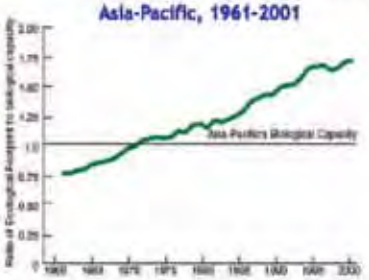

## Asia-Pacific Ecological Footprint

| | GDP/capita (US$) | Bio-capacity (GH/capita) | Eco-footprint (GH/capita) | Eco-deficit |
|---|---|---|---|---|
| Asia-Pacific | 5,800 | 0.7 | 1.3 | -0.6 |

World, 1961-2001




Asia-Pacific, 1961-2001




Source: WWF Living Planet Report Asia-Pacific 2005

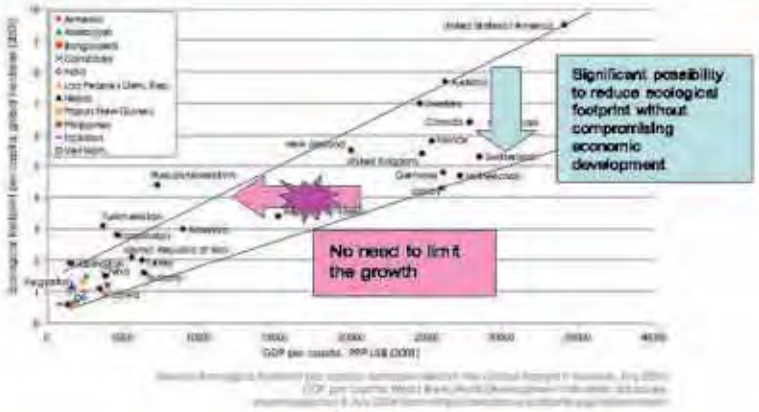
## Green Growth: Strategy for Asia-Pacific

- Adopted as the strategy for Asia-Pacific at the 5th Ministerial Conference on Environment and Development (MCED 5, March 2005, Seoul)
- Achieving economic growth without compromising environmental sustainability
- Feasible by highlighting the Ecological efficiency of the Economic Growth = Eco Efficiency


## Quality of Growth

- Economic Growth aims at Maximizing outputs
  = economic "goods"
- Environmental 'bads' increases as well
  = economic externality or market failure
- Different Patterns of Growth bring different pictures
  - Ecological Footprint
    - Japan (4.3), UK (5.6)
    - USA (9.7), Australia (7.0)
    - ROK (4.4)
  - Energy Intensity
    - Japan (157), Hong Kong (94), ROK (258), Russia (537)

## Different Patterns of Growth




## Decoupling Growth and Ecological Burden

- What makes the differences?
  - Socio-Economic Structure
  - Infrastructure
  - Consumption Pattern, Lifestyle
  - Public Policy, etc.
- Some examples - Transport Sector
  - Infrastructure Policy
    - US - mainly Motorized
    - Japan, EU - Integrated Networks - Railway / Motorway
  - Vehicles - Industry / Tax Policy
    - Small Car: Korea 4%, Japan/EU 24%
    - Large car: US 60%, Korea 30%, Japan/EU 20%

## Green Growth - Key Definition

- Green Growth is about pursuing economic growth and improving quality of life while at the same time preserving the ecological integrity
- Attaining MDG 1 (poverty reduction) & MDG 7 (environmental sustainability) at the same time
- Focusing on Improvement in Ecological Efficiency (Eco-efficiency)

## Green Growth - Useful Features

- Specific Strategy to Achieve the Goal of Sustainable Development
- Improvement of Development Trajectory
  - No limiting growth
- Socio-economic Policy Oriented - rather than Technology Oriented
- By definition, focus on Win-Win Intervention
  = Not diverting limited resources for Development (e.g. MDGs) to elsewhere
- Optimum Use of Resources - Economizing Financial Requirement for Multiple Development Challenges
- Economies - More competitive and Resilient (New Growth Engine)

## Green Growth in CC Context = Low Carbon Development

**Needs for Climate Action by all countries**

- Challenge to Humanity in Increasingly Globalizing Society
- More Threats to Poor and Marginalised
- Immediate Action for Mitigating Impacts/ Adaptation Necessary
- Long-term GHG Emission Reduction to avoid Further Intensifying Impacts

**Challenges**

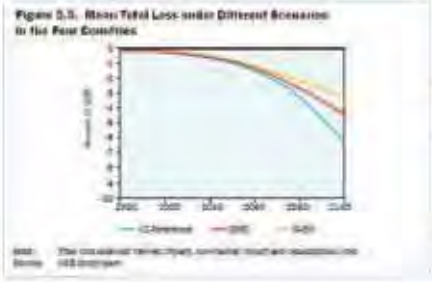
- Needs Sustaining Economic Growth
  → Making Climate Actions compatible with Sustained Economic Growth
- Competition with a number of other Socio-economic priorities
  → Needs a Holistic win-win Approach ("Co-Benefits")
- Limited Financial /Human / Technological Resources
  → Needs a Resource Efficient Approach

**The Answer is Green Growth - Low Carbon Development**

... or Low Carbon - Green Growth

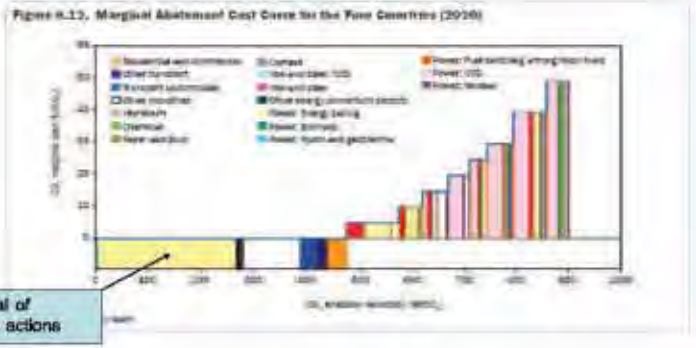
## Green Growth in CC Context Relevance and Valid

## Low Carbon Development to Prevent Economic Loss



- By anticipated impacts of climate change in SE Asia, economic loss up to 6.7% of GDP each year by 2100
- Undermine the progress in achieving MDGs and beyond
- GDP loss will lessen to 3.4 % if action taken to follow 450ppm scenario (2 degree increase).
- Global study shows less than 1%of GDP Mitigation cost required to limit to 2 degree increase.
- Adaptation will bring benefit 1.9% of GDP by cost 0.2% of GDP

## Potentials of Green Growth in Low Carbon Development




## Green Growth being Mainstreamed

**Institutional Development in AP Countries**

- China - Resource Efficient Society in 5-year Plan
- ROK - Low Carbon Green Growth as National Strategy / Presidential Commission
- Cambodia / Kazakhstan - Inter-Ministry Commissions / strategies
- Thailand, Philippines - Green Growth strategies / policies

**International / Regional Mechanisms**

- OECD Ministerial Declaration
- AP Ministerial Declaration on Green Industry

**UN-wide Activities**

- UN-joint initiative on Green Economy
- World Economic and Social Survey
- ILO/UNEP/ESCAP Green Jobs, etc.

## Green Growth - Policy Tracks

- Green Tax and Budget Reform
- Sustainable & Eco-efficient Infrastructure & Supply of Services
- Greening of Business and Market
- Sustainable Consumption - Demand Side Management
- Investment in Natural Capital

**+ Tools for Benchmarking the Progress**

**Opportunity for holistic thinking for all actions, esp. by Public Sector**

## An Example: Opportunities in Urban Transport

- Improvement needs / co-benefits
  - Transport for all (passenger / freight)
  - Transport effectiveness (avoiding traffic jam)
  - Industry promotion (logistics
  - Urban air quality / health
  - Fuel efficiency in cars
  - Energy efficient lighting / transmission
  - Security / crime prevention, incl. gender
  - Mobility/ accessibility for elderly, disabled
  - Rainwater drainage
- Climate Benefits
  - Locks into production and consumption patterns for decades
  - Responsible for 25% of energy consumption and CO2

## An Example: Opportunities in Urban Transport

- More opportunities
  - Platform for Government-wide Approach !Ministries have different entry-points!
  - Holistic approach = Economize long-term investment needs
  - Co-benefits to justify multiple sources of resources
  - New Business / Employment
  - Enhancing socio-economic integration and resilience
  - Opportunity for participatory envisioning of the Country's future

## Low Carbon - Green Growth Key to Success

- Future Vision and Political Will at the highest level
- Awareness and Technical Skill in Ministries across Government
- Institutional mechanism for ensure Policy Coherence and Coordination
- Public Support (Participation/ Partnership) vis-à-vis Benefit Sharing

## How ESCAP Can Help?

- Assistance to Institutional Development: Establishing Inter-Ministry Working Group on Green Growth / National Green Growth Roadmap
- Green Growth Capacity Building
- Networking amongst Countries / Stakeholders for exchange of information / experiences
- Incubation and Disseminating of Innovative Policy Ideas

## Conclusions

- Low Carbon Development is a necessary, but feasible and practical option
- Green Growth approach provides a useful strategy, highlighting eco-efficiency
- A wide range of socio-economic policy options are to be applied.
- Ensuring policy coherence and coordination is critical
- ESCAP supports institutional and human capacity development with innovative policy ideas

## Thank you for your attention

Environment and Development Division, UNESCAP
E-mail: escap-edd@un.org

WEBSITES

| | |
|---|---|
| Environment and Development Division | http://www.unescap.org/esd/index.asp |
| Green Growth | http://www.greengrowth.org |
| SINGG | http://www.singg.org |


Cover slide pictures courtesy of ManagEnergy (European Commission)

**Climate Policy in the EU and Germany**
**Development of Renewable Energies**

Presented by:
**Dr. Georg Maue**, Senior Expert for Climate and Energy Policy
German Federal Ministry for the Environment,
Nature Conservation and Nuclear Safety
E-mail: georg.maue@bmu.bund.de
Telephone: ++49/30/28550 3689

## Contents



## Targets for Climate Policy
### – Conclusions –

### IPCC Conclusions:

- Targets driven by limiting Global Warming to max. 2 ° C:
- Reduction of Global Emissions of 1990 by min. 50 % until 2050
- Peak very soon = start net Reduction now
- Industry States reduction pathway (IPCC):
  25 –40 % until 2020 vs. 1990
  80 – 95 % until 2050 vs. 1990
  EU and Germany are going along that path
- Dev. Countries Reduction Pathway:
  20 % until 2020 vs. BAU
  net reductions until 2050

## GHG Targets, EU and Germany

*Germany and the EU have decided on very ambitious targets in line with IPCC:*

EU Council, March 2007:

Binding Target: 20 % reduction in GHGs by 2020 versus 1990

Conditional: 30 % reduction in GHGs by 2020 versus 1990, provided other industrialised countries are willing to make comparable reductions

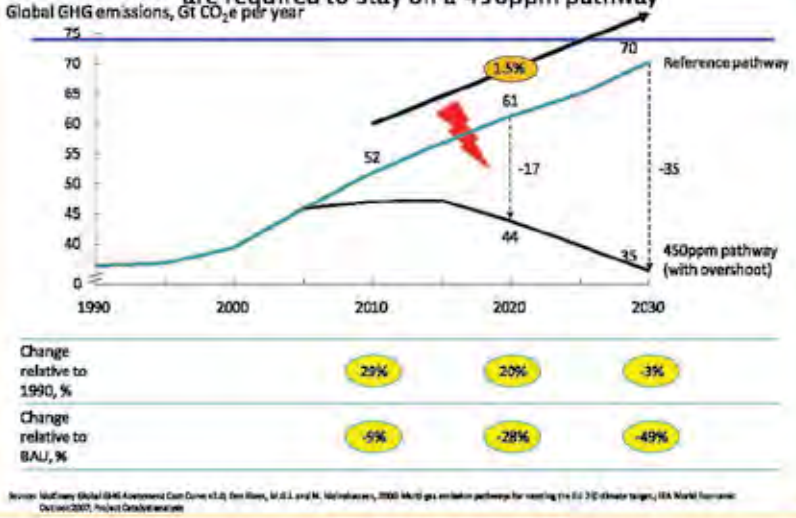
For Germany, a 30 % reduction in GHGs by 2020 translates into minus 40 %:

This requires a reduction of 270 million t/a GHGs compared to emissions volume in 2006!

4

# Measures and Policies for achieving the Climate Targets

## Globally 17 Gt of reductions below the reference pathway in 2020 are required to stay on a 450ppm pathway




## Policies are required and available, costs are moderate

- Cap and trade systems (EUETS)
- Building codes
- Fuel efficiency standards
- Fuel specifications
- Appliance efficiency standards
- Feed-in tariffs/Renewable portfolio standards
- Power plant performance standards
- Green taxation
- Remove fossil fuel subsidies
- Supporting information instruments (labeling, disclosure)
- And more ....
- Costs: < 0,12 % reduction of global GDP growth

## Climate action and renewable energy package

## Objectives agreed for 2020

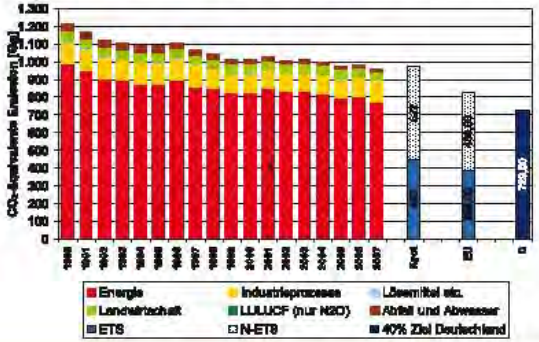
- 20% GHG reduction compared to 1990
  - Independent commitment
- 30% GHG reduction compared to 1990
  - In context of international agreement
- 20% renewables share of final energy consumption
- 10% biofuels in transport, with
  - production being sustainable
  - second generation biofuels commercially available

## Climate Action

- Overall Communication
- Revision of EU Emissions Trading System (the ETS)
- Effort sharing in non ETS sectors
- Directive on promotion of renewable energy, report on renewable energy support schemes
- Directive on carbon capture and storage, and Communication on demonstration plants
- Ordinance on CO2 emissions from cars
- Revised environmental state aid guidelines
- Accompanying Integrated Impact assessment

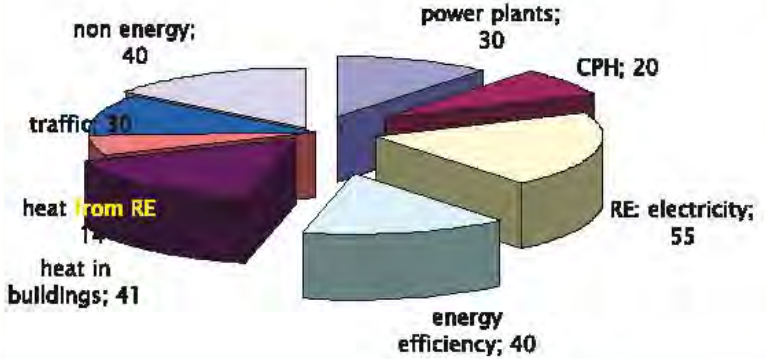
## The German Climate Package

- Target decided 2007: minus 40 % in 2020 vs. 1990
- Measures decided and adopted in 2008: the Integrated Energy and Climate Package




## 8 Main Sectors of the „Minus 40 %" Package

CO2 Reductions (Mio t/year) (Σ 270 Mio t/year)



## Co-Benefits of Climate Change Mitigation

- Independence from energy imports
- Independence from increasing energy costs
- no loss of comfort!
- →all mitigiation with existing technologies!
- Early action → good position for exporting Low-Carbon-Technologies
- No nuclear energy needed owing to more Efficiency and Renewables:
  - no reactor accidents
  - no nuclear waste
  - no proliferation of nuclear weapons

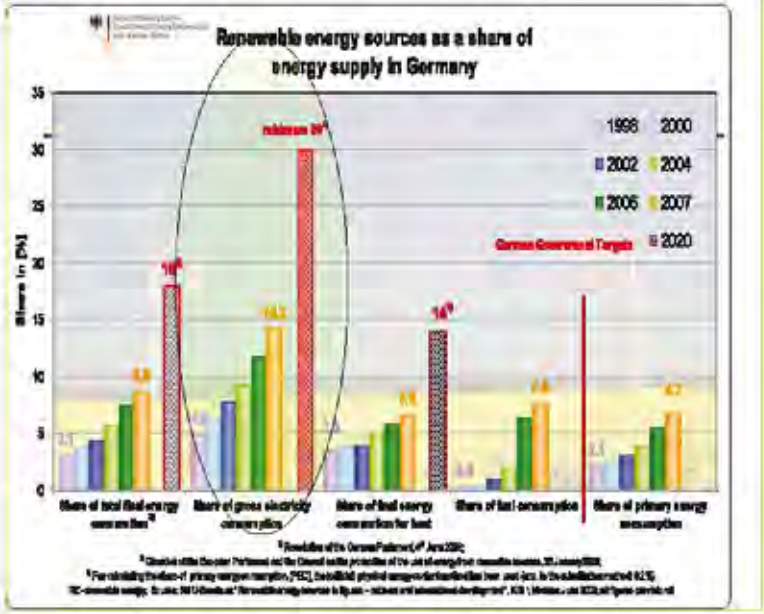
## Conclusions on the EU and German Climate Package

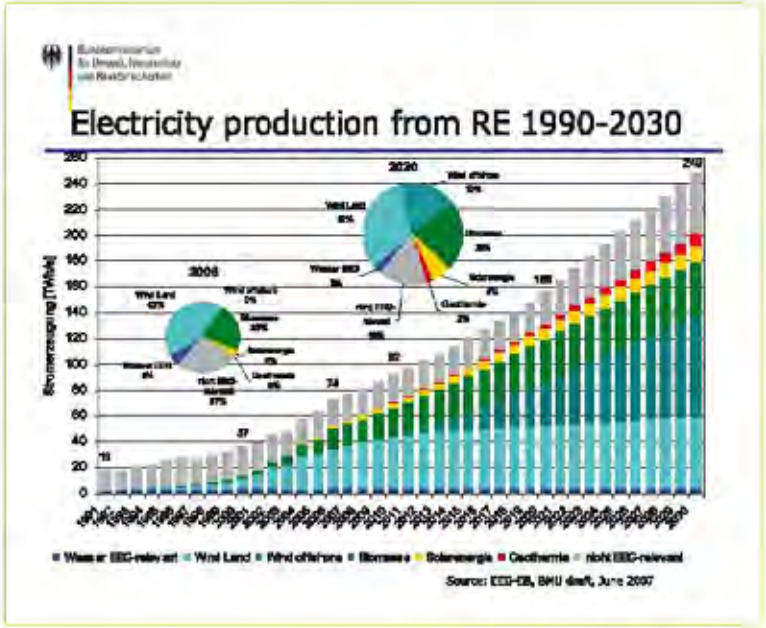
- EU showing leadership in climate change: specific binding measures for the 20/30% Target and Renewable Energies
- EU on a path towards a low-carbon economy
- Germany takes over a contribution of 40 % GHG reduction until 2020
- The recently agreed Climate programme translates reduction potentials into a mixed set of measures, based on binding frames, support schemes, initiatives and information.
- It covers all relevant sectors and will result in appr. 36 % GHG reduction
- Benefits outweigh the costs by 5 bill. €; the programme creates numerous socio-economic co-benefits (e.g. employment, energy independence)

## The Role of Renewable Energies

## (Wrong) Statement from1993 on the possible capacity of Renewables by electr. producers

Max. long term Potential of Renewables in Germany not more than 4 % (??)




## Legal Acts on RE in the EU and Germany

**EU:**

- Directive on the promotion of Renewable Energy: → 20 % share of RE in final energy consumption in 2020 (today: 8.5 %);
  → all Member States got national targets (Germany: 18 %; today: 7.5 %)

**Germany:**

**Binding Targets:**

- Increase the proportion of electricity generated from renewables (> 30 % until 2020)
- Use of renewable energies to generate heat – increase to 14 %

**Acts:**

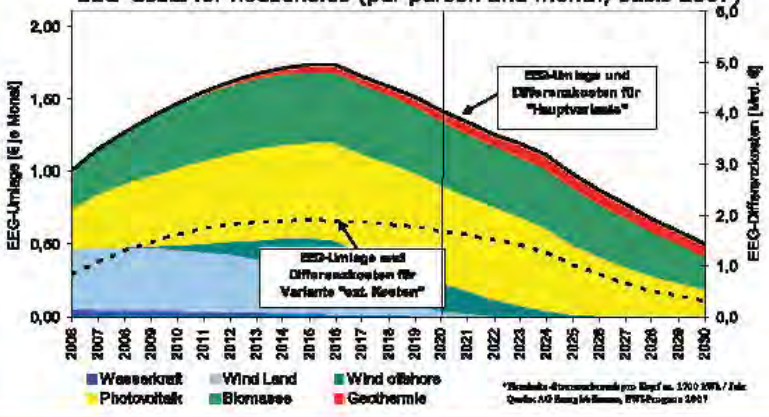
- Renewable Energy Act
- Renewable Energy Heat Act

## Main Support Instrument for Renewables: The RE Act (EEG)

- Main Instrument: Renewable Energy Act → Feed in Tariff System for the promotion of power from RE
- Priority access for RE to the power grid
- Priority transmission and distribution
- Obligation of grid operators to purchase the electricity produced from RE
- Fixed price ("tariff") for every kilowatt hour produced from RE for 20 years
- Energy suppliers are allowed to charge the tariffs in the final electricity price to consumers

## Additional Costs 1990-2030

Development of the estimated differential costs and the additional EEG-Costs for households (per person and month, basis 2007)




## Balance of Renewables in Germany 2008

- Avoided CO2-Emissions: 109 million tonnes
- Employees: 278.000 Jobs in the Ren. Energy Sector
- Turnover: total economic turnover in 2008 in the RE sector: 28,8 billion Euro

## Conclusions on Renewables/lessons learnt

- Renewable Energies is the most relevant corner stone of Climate Policy (Mitigation) in Germany
- The „Success-Story" of RE in Germany builds on binding targets and acts (financial support and feed-in tariffs)
- RE will be the biggest electricity source in the mid-term with viable market prices.
- in the German case: mid-term financial support required (high abatement costs in the beginning), but:
- co-benefits: less energy imports (= energy security), more jobs, long-term price stability

## Relevance of the German experiences for the situation in Cambodia

| | Cambodia | Germany |
|---|---|---|
| Mitigation | Secondary, but high potential (e.g. in the electricity sector) | Priority; still high potential |
| Climate policy on Mitigation | Investigation and Planning status | policy agreed for 40 %, implemented for appr. 30 % reduction |
| Renewables | Likely high potential (solar, biomass), little usage | Policy priority, highly supported, rapid development |
| Energy efficiency | High potential (e.g. electricity production) | Policy priority, high potential, ambitious targets (doubling until 2020) |

First National Forum on Climate Change

# Development Process of the National Strategic Development Plan - an Update (2009-2013)

By Poch Sovanndy

Deputy Director General, Ministry of Planning

21 October 2009

## Outline

- Background
- Content and Format
- The Development Process
- Responsible agencies

## Background

- Since 1993, The Royal Government of Cambodia (RGC) had developed numerous plans, policies and strategies such as:
  - The Rectangular Strategy;
  - The Socio-economic Rehabilitation and Development Plan, 1994-95;
  - The first 5 years Socio-economic Development Plan, 1996-2000;
  - The second 5 years Socio-economic Development Plan, 2001-2005;
  - The Cambodian Millennium Development Goals, 2003;
  - National Poverty Reduction Strategy, 2003;
  - The National Population Policy, 2003;
  - Others

## Background, Cont'

- Build on the Harmonization and Alignment Plan, the RGC decided to develop a single national plan incorporating all the policies, plans and strategic priorities;
- The document is called National Strategic Development Plan (NSDP) 2006-2010;
- At the beginning of the 4th parliamentary mandate, the RGC decided to update the NSDP 2006-2010 to an NSDP Update (2009-2013) to be consistent with its mandate;
- According to the workplan, the NSDP Update (2009-2013) will be finalized by the end of March 2010.

## Content and format

- The NSDP Update is developed consistent with the format of the Rectangular Strategy, Phase II;
- Continued focus on speedy poverty reduction, achieving the CMDGs, and ensuring stability of macro-economy and promotion of broad-based growth;
- Review the progress made so far and status both inside and outside of the country.

## Content and format

- Assess Cambodia's opportunities and risks;
- Review and define new priorities, programs and projects proposals and make new projection for Cambodia's socio-economic development for the next phase, ending in 2013;
- The content includes: i) Introduction, ii) Main achievements and challenges; iii) Macro-economic framework; iv) Main policies and actions; v) Spending, resources, and programs; vi) Monitoring and evaluation; and vii) Conclusions

## The development process

- RGC's policy platform for the 4th legislature;
- RGC's Rectangular Strategy, Phase II;
- A circular issued by the RGC defining the perspective and process of the NSDP Update;
- A concept note on development of NSDP 2009-2013;
- Request for line ministries and agencies to provide input to the MoP;
- Technical Working Group approach to comment on the development of sectoral input.

## The development process, cont'

- First Draft to send to the line Ministries and Agencies for comments by the end of November;
- An updated draft version will be produced in Dec 2009 based on comments provided by line Ministries and Agencies and Development Partners;
- An inter-ministerial meeting organized to discuss the draft version;
- Final Draft version to be sent to the Council of Ministers in Jan 2010 for debate and approval.

## The Development process, Cont'

- Organize regular meetings with other three agencies at central level (Ministry of Economy and Finance, Cambodia Rehabilitation and Development Board of the Council for the Development of Cambodia, and the Supreme National Economic Council) to discuss over the Draft and seek comments;
- In Feb 2010, the Plenary session of the Council of Ministers will approve on the Draft;
- NSDP Update 2009-2013 will require approval by the National Assembly and the Senate.

## Responsible Agencies

- MoP in the lead agency responsible for guiding the development of NSDP Update 2009-2013 and shall:
  - Provide technical guidance to the line ministries and agencies on the development of input and the overall processes for the development of NSDP Update 2019-2013;
  - Ensure submission of input by all line ministries and agencies;
  - Develop and review the draft document based on input, suggestions and recommendations received from all relevant stakeholders at each stage of its development;

## Responsible Agencies, Cont'

- Conduct regular consultations and close coordination with other 3 agencies at the central level – the MEF, CRDB of the CDC and the Supreme National Economic Council- at each stage of its development;
- Report to the Leadership of the RGC on progress of work at each stage of its development.

## Responsible Agencies, Cont'

- Each government's relevant Ministries and Agencies shall establish a working group led by a senior official, from the Secretary of State and higher, to implement the task with close coordination with the MoP;
- All relevant Government's Ministries and Agencies shall ensure comprehensive input is submitted and close cooperation with the MoP in implementing the task in accordance with the agreed workplan;

# Thank You!

Council for the Development of Cambodia | Cambodian Rehabilitation and Development Board

# Ensuring a coordinated response to climate change

## Identifying relevant aid effectiveness principles

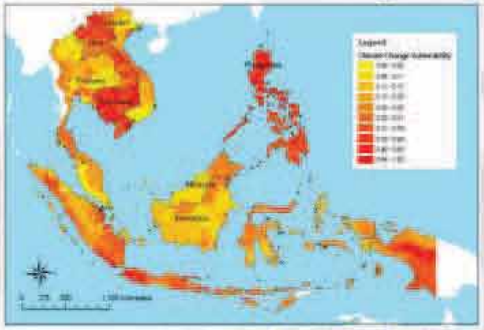
H.E. Chhieng Yanara
Secretary General
Cambodian Rehabilitation and Development Board
Council for the Development of Cambodia (CDC)

October 2009

Cambodia

Council for the Development of Cambodia | Cambodian Rehabilitation and Development Board

## "Low adaptive capacity has made Cambodia among the most vulnerable regions"



source: Yusuf & Francisco (2009)

Aid effectiveness means supporting a response that develops capacity for adaptation at national and sub-national levels and across all sectors

Cambodia

Council for the Development of Cambodia | Cambodian Rehabilitation and Development Board

## Building on global and national frameworks

- The NSDP provides a national framework for integrating NAPA and addressing climate change across all sectors
- Public Administration Reform and Public Financial Management Reform will be the entry points for developing capacity and for allocating resources in a coordinated and sustainable manner
- The Decentralisation and Deconcentration reform is the entry point for ensuring that sub-national activities are consistent with climate change adaptation
- Cambodia's aid management structures, principles and priorities are suited to the integration and promotion of climate change adaptation
- Accra Agenda for Action - an increasing global convergence between aid effectiveness principles and the climate change agenda

**The NCCC must incorporate and manage links with these initiatives and reforms**

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## Aid management structures

Cambodia Development Cooperation Forum (CDCF)

Government-Development Partner Coordination Committee (GDCC)

Technical Working Groups (TWGs)

1. Rural Water Supply, Sanitation & Hygiene
2. Planning & Poverty Reduction
3. Decentralisation & Deconcentration
4. Legal & Judicial Reform
5. Public Financial Management
6. Gender
7. Infrastructure & Regional Integration
8. Private Sector Development
9. Health
10. Partnership & Harmonisation
11. Food Security & Nutrition
12. Land
13. Education
14. Public Administration
15. HIV/AIDS
16. Mine Action
17. Fisheries
18. Agriculture & Water
19. Forestry & Environment

Cambodia

# Aid management principles

Identify and implement relevant activities from the H-A-R Action Plan:

- A comprehensive and results-based national strategy (NAPA)
- Information systems, coordination and monitoring arrangements that bring together national, sub-national and sectoral systems
- Coordinated capacity development activities consistent with PAR, D&D (including appropriate technical cooperation)
- Dialogue and review mechanisms for all stakeholders
- Communication systems that can receive, process and disseminate information in a useful and timely manner
- Special focus on coherent external resource mobilisation, coordination and implementation arrangements

Cambodia

# Climate change funds/programmes

| | | |
|---|---|---|
| **UN Framework Convention on Climate Change** | | |
| The Global Environment Facility | GEF | USD 1 billion |
| Sustainable Forest Management | GEF | USD 154 million |
| Sustainable Priority on Adaptation | GEF | USD 90 million |
| Special Climate Change Fund | GEF | USD 90 million |
| Least Developed Countries' Fund | GEF | USD 172 million |
| Adaptation Fund | GEF | USD 100m available |
| **Bilateral** | | |
| Cool Earth Partnership | Japan | USD 10 billion |
| Climate and Forest Initiative | Norway | USD 2.2 billion |
| Environmental Transformation Fund | UK (via WB CIF) | USD 1.18 billion |
| Amazon Fund | Brazil | USD 102 million (Norway) |
| International Climate Initiative | Germany | USD 764 million |
| International Forest Carbon Initiative | Australia | USD 129 million |
| MDG Achievm't Fund (CC window) | Spain/UNDP | USD 90 million |
| Global Climate Change Alliance | European Commission | USD 76 million |
| **Multilateral** | | |
| Forest Carbon Partnership Facility | World Bank | USD 385 million |
| The Carbon Partnership Facility | World Bank | USD 500 million |
| Global Facility for Disaster Reduction/Recovery | World Bank administered | USD 83 million |
| UN Programme on Reducing Emissions from Deforestation and Forest Degradation | UN-REDD | USD 52 million |
| Climate Investment Funds<br>a) Clean Technology Fund<br>b) Strategic Climate Fund | World Bank administered | USD 6.2 billion |
| Sustainable Energy & Climate Change Initiative | IADB | USD 29 million |

Cambodia

# Summary

1. Aid effectiveness must support the development and application of capacities that enable adaptation to climate change
2. Commitment, partnership and previous aid effectiveness experience provide an opportunity to put in place effective principles from the outset
3. Fragmented support, capacity challenges and multi-stakeholder coordination needs present some very significant challenges to be addressed
4. Coordination of Government, DPs and civil society - & integration of their current activities - must be managed within a coherent institutional framework led by NCCC
5. CRDB/CDC, as the national aid coordination focal point, is fully supportive and can assist in developing aid management capacities/structures

Cambodia

# CLIMATE CHANGE AND BIODIVERSITY

ROBERT MATHER
21 OCTOBER 2009

INTERNATIONAL UNION FOR CONSERVATION OF NATURE

## AGENDA

1. BIODIVERSITY OF CAMBODIA
2. CLIMATE CHANGE IMPACTS
3. CLIMATE CHANGE ADAPTATION
4. MANGROVES FOR THE FUTURE (MFF)
5. KEY MESSAGES

## Mekong Fisheries

- The Lower Mekong supports the world's richest inland fisheries – 3 million tons p.a. - valued at least $3billion/year
- Provides up to 60% of protein intake for 60 million people
- Productivity is driven by the Flood Pulse hydrology of the Mekong (wet season flows are 30x greater than dry season flows)
- 70% of fish catch in Tonle Sap is species that migrate long-distances between rainy season inundated floodplains and dry season refuge habitats (deep pools – can be 70 metres deep)

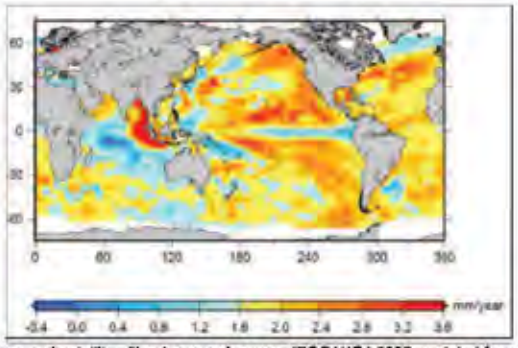
INTERNATIONAL UNION FOR CONSERVATION OF NATURE

## Some of the most highly vulnerable natural systems to the projected change in climate include:

Arid Lands
High Latitude, High Altitude Ecoystems
Cryosphere
Glacial fed regions
Wetlands and Freshwater Ecosystems
Low-lying coastal areas
Coral reefs
Large deltas

INTERNATIONAL UNION FOR CONSERVATION OF NATURE

## Regional Variability in Observed Sea Level Rise (1955 to 2003)




(combined tide gauge and satellite altimetry record, source IPCC WG1 2007, updated from Church et al. 2004)

**Extreme sea levels have greatest affect – not the global or regional average change in sea level.**

## Climate Change Impacts on Coastal Ecosystems

1. **Corals:** Increasing water temperature causes coral bleaching; more dissolved carbon dioxide increases acidity and reduces coral accretion
2. **Sea grass:** Changes in temperature, UV radiation, salinity, sea level and storm activity affect sea grass distribution
3. **Estuaries:** Sea level rise will displace plant and animal communities inland – estuarine communities may persist if migration is not restricted; changed hydrological cycles will change freshwater and nutrient input to estuaries may lead to eutrophication
4. **Sandy Beaches:** Sea level rise and increase in storms will increase beach erosion
5. **Mangroves:** Increased temperature and CO2 levels may enhance growth, while increased storm intensity and salinity intrusion may have negative impacts. In some places accretion may keep pace with or exceed sea-level rise, especially if sediment arriving at the shoreline is not blocked by upstream dams, and groundwater is managed appropriately. In other places mangrove shorelines are subsiding and thus experiencing a more rapid relative sea-level rise

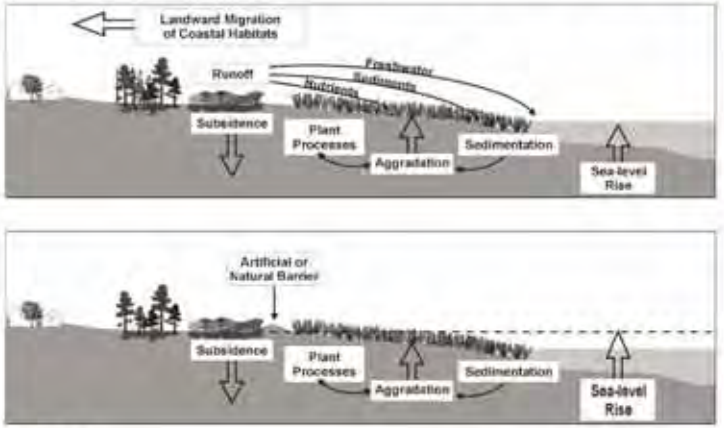
INTERNATIONAL UNION FOR CONSERVATION OF NATURE

## REDUCING IMPACTS OF CLIMATE CHANGE

Examples:

- Stop activities that cause subsidence and erosion
- Restore coastal habitats
- Restore flow regimes
- Remove barriers to inland migration of ecosystems (natural and restored)

## Remove impediments to inland migration of coastal ecosystems (restored and natural)




USGS

(Burkett, 2001)

## Mangroves for the Future

INVESTING IN COASTAL ECOSYSTEMS

## A common vision

Mangroves for the Future

a more healthy, prosperous and secure future for all coastal populations in Indian Ocean countries, where ecosystems are conserved and managed sustainably

## Where we work…

**Focal countries:** India, Indonesia, Maldives, Seychelles, Sri Lanka, Thailand
**Dialogue countries:** Bangladesh, Kenya, Malaysia, Pakistan, Tanzania, Viet Nam
**Plus:** offer of support to Myanmar after Cyclone Nargis

## Climate Change Adaptation Planning


## MFF in summary…

- **Policy relevant** – supporting national legal and policy frameworks
- **People centered** – assisting coastal populations
- **Partnership based** – working to meet the needs of all partners

## Key messages:

Climate change is already impacting coastal zones and large deltas and their human communities that depend upon them.

Risks will increase over coming decades

The impact of climate change is exacerbated by increasing human-induced pressures.

Adaptation for the coastal areas of developing countries will be more challenging than for coasts of developed countries, due to constraints on adaptive capacity.

Adaptation costs are much less than the costs of inaction.

The unavoidability of sea-level rise even in the longer term frequently conflicts with present-day human development patterns and trends.


Thank you!

## Climate Change, Gender and Poverty

First National Forum on Climate Change
*Phnom Penh, Cambodia*
*October 19-21, 2009*

Oxfam

## Climate change is happening...

1. What will climate change mean for poor people?
2. Why is climate change a gender issue?
3. Mitigation & Adaptation: stop hurting, start helping
4. What needs to happen to ensure a just solution for ALL ?

Oxfam

## Climate change will undermine livelihoods, especially for poor people...

Agriculture is critically important to poor people:

- More than 70% of poor people rely on agriculture
- Developing countries have more farmers, nearly 3b, approx. 900m in absolute poverty.
- Agriculture backbone of Cambodian economy
- Primary source of employment for 73% of labour force

Oxfam

## Expected climate impacts in agricultural communities:

- Higher temperatures
- Less rainfall
- More erratic rainfall

- Heavier rain
- More flash floods

- Loss of vegetation
- More hurricanes and storms (more disasters)

Oxfam

**But Climate Change will hit women harder**

- .....BECAUSE

Oxfam

Rural women produce much of the family's food





Oxfam

Rural women produce much of the family's food




- on marginal lands
- without irrigation
- using saved seeds
- with no formal training or little access to extension services
- with limited access to credit

Oxfam

**Women are more exposed, vulnerable to disaster**


BBC NEWS

BBC News 24

News Front Page
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Last Updated: Saturday, 26 March, 2005, 00:27 GMT

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**Most tsunami dead female - Oxfam**

**More women than men were killed by the Asian tsunami, Oxfam figures from India, Indonesia and Sri Lanka suggest.**

In some regions the disaster claimed four times as many women as men.

Oxfam

## Cambodia: Women and Agriculture

- Nearly 80 percent of these workers are primarily engaged in subsistence agriculture with women comprising 56 percent of the primary workforce in subsistence agriculture and 54 percent of the workforce in market- oriented agriculture;
- Majority of these women are unpaid family workers;
- 71percent of women and 50 percent of men in Cambodia are functionally illiterate (UNDP/UNESCO, 2000).

Source:
http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CAMBODIAEXTN/

Oxfam

## Cambodia: Women and Agriculture

- Agricultural extension service levels remain very low in Cambodia and women have significantly less access to what little there is
- Men and women tend to specialize in different tasks. For example, in rice farming, women are responsible for seed preparation and planting (soaking, cleaning, storing, broadcasting), weeding and low-tech pest control. Men are responsible for land preparation, irrigation, pesticide spraying and mechanical threshing.

Oxfam

## Cambodia: Women provide household water

- 29 percent of the Cambodian population has access to a clean water supply – 53 percent of urban dwellers and 25 percent of the rural population (World Bank, 2003).
- It is estimated that Cambodians spend one to two hours a day collecting water, and this is done primarily by women
- Women spent much of each day in the dry season retrieving water for cooking, washing and bathing purposes – nearly twice the time they spent in the wet season (ADB, 2001).

Oxfam

## Cambodia: Women and food security

- Women collect wild resources such as shellfish, firewood, seeds, snails, weeds to exchange for rice
- Important sources of food and income security for the family
- All these are threatened by natural degradation and the impact of climate change

Oxfam

## Cambodia: Women as Care Givers

- They cook, clean, and care for the sick
- They look after their children
- All without payment and at the expense of their own health

Oxfam

## Cambodia: Women and Climate Change

Climate Change will mean that:

- Women will spend more time collecting wild foods, water because of their scarcity
- This will take their toll on their already poor health
- Take time away from income generating
- Limit their capacity, abilities, aspirations and their rights

MORE POVERTY, MORE EXCLUSION

Oxfam

## What needs to be done? Stop harming by avoiding dangerous Climate Change

Stay below 2°C (3.6°F) threshold for dangerous climate change

Global goals

- 2020: 30% below 1990
- 2050: 50% below 1990

Oxfam

## What needs to be done? Start helping by financing adaptation

- ✓ Additional, adequate international finance
- ✓ Funding from those most responsible and capable (rich countries)
- ✓ At least $50b annually
- ✓ Pro-poor national adaptation plans
- ✓ Gender focus

Oxfam

## What is happening on the road to Copenhagen?

Nine months ago NO gender language in climate change negotiations.

In Poznan: No gender language in UNFCCC/ Kyoto Protocol

In Bangkok: 23 paragraphs on women and gender equality and equity in the AWG-LCA negotiating text

Oxfam

## What is happening on the road to Copenhagen?

- Gender and women's organizations working to ensure that gender stays in the final agreement
- Women's expertise, experiences, needs and capacities must be part of any kind of climate change discussion and solutions
- Gender equality needs to be mainstreamed in climate change discussions and in all national adaptation plans

Oxfam

## Gender and Climate Change: What is needed?

- Meaningful women's participation at all levels on climate change issues - women as agents for change
- Identify women's skills and knowledge on issues related to adaptation and mitigation
- Use gender analysis for vulnerability assessments: Recognize that women are more vulnerable in climate scenarios and undertake analysis of this in relation to different sectors (water, agriculture, health)

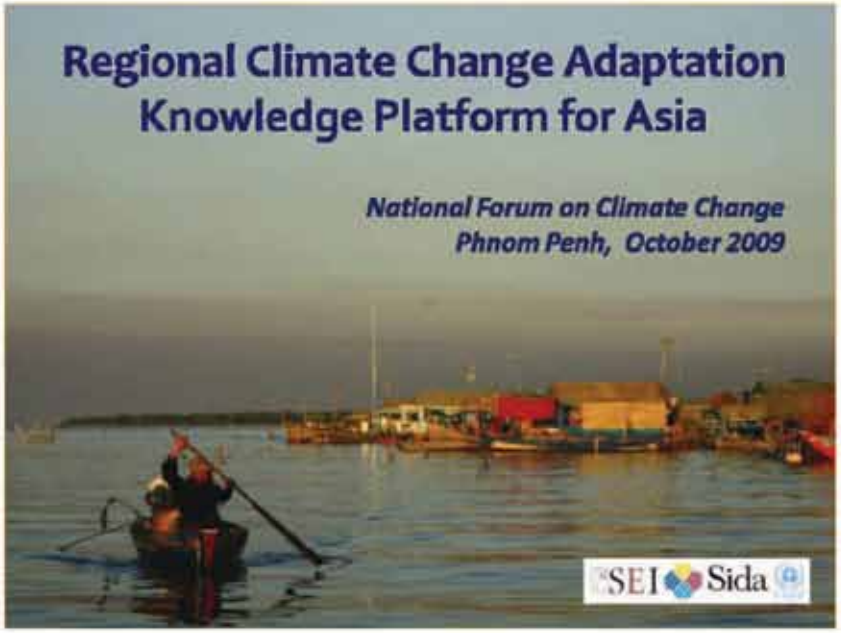
Oxfam

## Gender and Climate Change: What is needed?

- Understand and address differentiated natural resource use patterns, access to and control over assets to plan adaptation strategies
- Gender equality as part of social and economic conditions
- CEDAW (United Nations Convention on the Elimination of All Forms of Discrimination Against Women)

Oxfam

Thank you
Oxfam




## The Platform in Brief

- Helping countries adapt to the challenges of climate change
- Building bridges between knowledge on climate change adaptation and the people and organisations that need it
- **Supporting information sharing, research, policy making, and capacity building**
- Bringing together adaptation researchers, practitioners, policymakers and business leaders

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## Platform Goal & Purpose

Goal:

**To strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national and regional levels**

Purpose:

- **establish a regionally & nationally owned information exchange mechanism**
- facilitate the integration of climate change adaptation into national & regional economic & development policies, processes & plans
- **strengthen linkages with development agenda**
- enhance research & institutional capacity

Fishers in Hambantota, Sri Lanka / L. Schipper

## Outputs and Specific Objectives

**1. Generation of new knowledge**

To facilitate and promote understanding and guidance for the development and implementation of national and regional climate change policy, plans and processes

**2. Application of existing and new knowledge**

Synthesis existing and new climate change adaptation knowledge to facilitate its application in sustainable development practices at the local, national and regional levels

**3. Regional knowledge sharing system**

To promote dialogue, joint learning, cooperation and improved exchange of knowledge, information and methods through sharing of experiences and regional consultation

## Phase 1 Geographic Scope (2009-2011)

- Greater Mekong Sub-Region (Cambodia, China PR, Lao PDR, Myanmar, Thailand & Viet Nam), and
- Other Asian countries, including Bangladesh, Bhutan, Indonesia, Malaysia, Nepal, the Philippines & Sri Lanka.


## National Level Activities (Phase 1)

1. **Country knowledge mapping exercise**
   Users and providers
2. **Linking and supporting existing or emerging national platforms**
   Institutional mechanism for integrating adaptation into national processes and plans
3. **Identification of research priorities**
   through the perspective of knowledge users
4. **Platform strategy to support the development of adaptive capacity for each country**
   building on national self capacity assessment

Girl in Phunaka, Bhutan / K.K. Chiang

## Not all by ourselves...

**Initial key implementing partners:**

- Asian Institute of Technology/UNEP Regional Resource Centre for Asia and the Pacific (RRC.AP) UNEP Collaborating Centre
- Stockholm Environment Institute (SEI)
- Swedish Environment Secretariat for Asia (SENSA)
- United Nations Environment Programme (UNEP)

**Working closely with national & regional partners to develop and implement programme of activities**

Pics © S.Fortuna2009

## Contacts


Asian Institute of Technology /UNEP Regional Resource Centre for Asia & the Pacific (RRC.AP)
Mahesh Pradhan (mahesh.pradhan@unep.org)

Stockholm Environment Institute (SEI)
Kai Kim Chiang (kaikim.chiang@sei.se)

Swedish Environment Secretariat for Asia (SENSA)
Anders Granlund (anders.granlund@foreign.ministry.se)

United Nations Environment Programme (UNEP)
Serena Fortuna (serena.fortuna@unep.org)


# Climate Change and Human Development

**Cambodia Human Development Report 2010**

Presentation to the National Climate Change Forum (NCCF)
Lay Khim, E&E Team Leader, UNDP Cambodia

Presentation structure:

1. What is **Human Development?**
2. How Climate Change impacts **Human Development?**
3. **Human Development** and Climate Change challenges in Cambodia
4. **National Human Development Report** (NHDR) 2010 on climate change

## 1. What is Human Development?

**Human Development concept** (1990-)

- Alternative perspective and measurement of development focusing on "people"
- It is about expanding people's options to live a long and healthy life, to be knowledgeable, and to have a decent standard of living.

**Human Development Index (HDI):** Composite measure of three dimensions:

- Living a long and healthy life (life expectancy)
- Being educated (adult literacy, school enrolment)
- Having a decent standard of living (purchasing power parity, income)

Also: **Human Poverty Index (HPI)** and **Gender-related Development Index (GDI)** to supplement HD measurement

**Measuring Human Development**

Alternative to economic development measurement by physical goods and services (e.g. GDP)

e.g. according to the latest global comparison (2007)

Cambodia ranked 137th / 182 in HD Index, while 143rd in GDP

Also - countries with similar level of income can have very different HDIs

→ **Human Development Report (HDR)** published globally since 1990

Serves as **reliable source and alternative perspective of critical issues of human development** worldwide.

## 2. How Climate Change impacts **Human Development?**

**Climate change – vulnerability & development issue**


**Social stresses, economic losses, increased poverty, unsustainable growth**
→ **Human Development** impacts

## The Human Development backdrop to climate change

**Poverty, child mortality and malnutrition**

- There are still around 1 billion people living on less than a dollar a day.
- Around 28 percent of children in LDCs are underweight or stunted.
- Only 32 countries (of 147) are on track to achieve the MDG on child mortality

**Inequality**

- More than 80 percent of the world's population lives in countries where income differentials are widening
- Underlying inequalities act as a barrier for early recovery after shocks

## Low human development traps

**The potential human costs of climate change have been understated**

- Climate related risks force people into downward spirals of disadvantage that undermine future opportunities
- In Ethiopia, children exposed to a drought in early childhood are 36 percent more likely to be malnourished five years later – a figure that translates into 2 million additional cases of child malnutrition
- Indian women born during a drought or a flood in the 1970s were 19 percent less likely to ever attend primary school

→ Climate change can limit people's options and ability

## Five human development tipping points

Reduced agricultural productivity
Heightened water insecurity
Increased exposure to extreme weather events
Collapse of ecosystems
Increased health risks

## Particularities to note

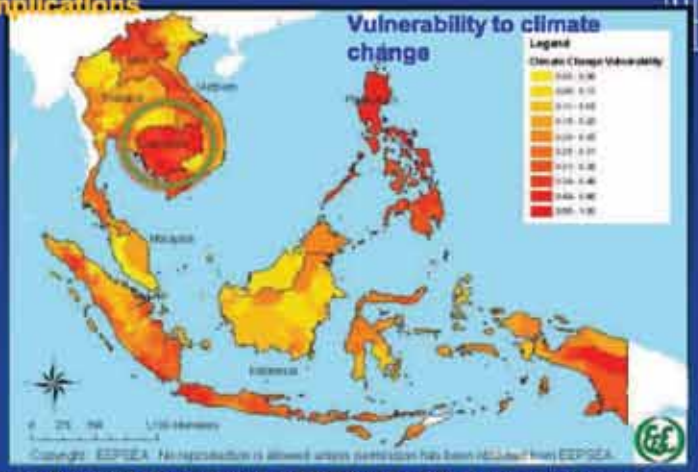
- Effects are **cumulative, irreversible** and **global**
- **Inverse relationship** between vulnerability and responsibility
- **Unequal impact** - the poorest people and countries affected the earliest and most
- **Significant socio-economic implications**

  Cost of inaction – estimates vary:

| Cost of inaction estimates | By: |
|---|---|
| 5-20% of global GDP | Stern Review, 2006 |
| 1-5% global GDP for 4 °C warming (more for developing countries) | IPCC, 2007 |
| 6.7% of GDP in four SE Asia countries | ADB, 2009 |

## 3. **Human Development** and Climate Change challenges in Cambodia

## Key vulnerabilities: Economic and human development implications




Source: Reproduced with permission from EEPSEA. Vulnerability as composite of exposure to climatic hazards, sensitivity to the hazards, and adaptive capacity

## Composition of vulnerability

Severe climatic events; floods; drought; sea level rise

Population density; extent of protected area

Climatic Hazards

Sensitivity

Vulnerability in Cambodia

Lack of Adaptive Capacity

Socio-economic factors: Human Development poverty, inequality, technology & infrastructure: power supply, irrigation, road, communication, ...

- Over 80% of population living in rural areas, of which 52% in the central plains and 30% around Tonle Sap Lake
- Short-term: increase in **floods** and **droughts** Cambodia already vulnerable – **main contributor to poverty**.
- Long-term: e.g. changes in the Mekong flood pulse system; reverse impacts on current development efforts

Map of flood-prone communes

Map of drought-prone communes

Source: WFP

## Various implications

**Economic losses:**

- Between 1998-2002, floods caused 70% of production losses of rice, while drought 20%.
- The floods of 2000-2002 caused US$ 205 million damage. (Nearly 40% of ODA for 2002)

→ Increased drought and floods can lead to further economic losses and loss of livelihood assets.

Destructive floods have become more frequent in recent years. (INC)

## Agriculture & food security

- **High dependency on agriculture:**
  c. 30% of GDP, 59% of employment. (2007)
  cf. 11% of GDP, 43% of employment in the SEA region (2004)
- High dependency on **rain-fed farming** makes agriculture sector particularly vulnerable.

% of arable land irrigated (WB

| Cambodia | Laos | Vietnam | Thailand | Myanmar | Philippines | Malaysia | Indonesia |
|---|---|---|---|---|---|---|---|
| 7% | 19% | 23% | 31% | 45% | 27% | 20% | 20% |

- 80% of farmers grow rice, 60% for subsistence.
- High dependency on single crop + low processing capacity
  → Implication for **food security**

- Climate change impact on agriculture base
  → Impact on **agricultural productivity**
  → **employment**

## Fisheries – Central to Cambodian lifestyle: food, income and livelihoods

- Most intense inland capture fisheries in the world. (FIA)
- High contribution to GDP (9-12%) (WorldFish Centre) with high dependency on natural "capture" rather than aquaculture.

| Capture fisheries production as % GDP (FAO) | Cambodia | Laos | Vietnam | Thailand | Myanmar | Philippines | Malaysia | Bangladesh |
|---|---|---|---|---|---|---|---|---|
| | 10% | 1.4% | 2.3% | 2% | 4% | 2.2% | 1.1 | 1.0% |

Climate change → impact ecological dynamism & fisheries

Vulnerability map of national economies to impact of climate change on fisheries

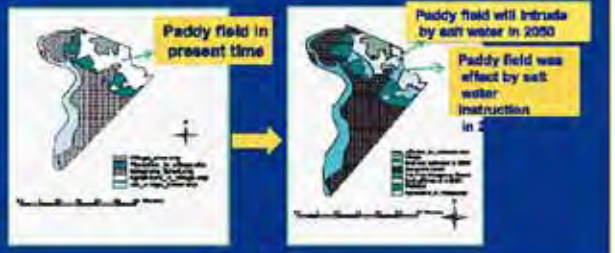
- Cambodia's economy is rated as **one of the most vulnerable** to impacts of climate change on **fisheries**. (Allison et al 2009)
- A significant proportion of those involved in fisheries are women.

## Sea level rise

Source: INC (MoE, 2002)

- 435 km coastline and low elevation of central plain
- e.g. 1m rise can submerge 56% of Koh Kong City

→ Possible damage to infrastructure, agriculture, tourism, and livelihood from submersion and sea water intrusion




Impact of sea level rise on agriculture in Sihanoukville Province
Source: RUPP, DES (2009)

## Health

- Risk of **water quality degradation and sanitation**
- **Health**: increase in **water-related / tropical diseases** such as malaria and dengue
  → Rural poor, especially children, affected most

- Poor sanitation already leads to losses of USD 448 million / year (WB 2008)
  → Increased health costs

**Various other socio-economic and human development impacts**

## 4. National Human Development Report (NHDR) 2010 on climate change

- **"National" Human Development Report (NHDR)** produced since 1992 in over 140 countries (628 reports as of April 2009)
- **In-depth and independent policy analysis & advocacy tool** which reflect people's priorities while strengthening national capacities.
- The process = An **advocacy tool** designed to appeal to a wide audience: policymakers, the private sector, the general public, NGOs and international development cooperation agencies
- *NHDR: Best understood as an on-going capacity development and advocacy process in which the published report itself represents only one important output.*

## Past NHDR in Cambodia

1997: Poverty assessment

1998: Women's contribution to development

1999: Village economy and development

2000: Children and employment

2001: Societal aspects of the HIV/AIDS epidemic

2007: Expending choices for rural people

- Key government partner for preparation of the above: Ministry of Planning
- Each publication followed by advocacy work

## Proposed NHDR 2010 on climate change

### Rationale

- We know climate change is affecting / to affect Cambodia
- Cambodia is highly vulnerable
- Recognised as a threat by the government on paper
- Actions & coordination of sectoral ministries emerging but limited
- **Major awareness / perception gap**: *myth, environmental, apocalyptic, "developed world's responsibility only"*
- Various studies and activities on-going (such as MoE V&A)
- BUT, difficult for policy makers to reflect in planning
- Still a major knowledge gap as to **what it means to Cambodia; what actions Cambodia should take in adapting to climate change or benefiting from various opportunities?**

## Objectives

- To promote public & decision makers' awareness on the issue by making climate change **"relevant"** to Cambodia

This is to be done by:

- Demonstrating **threats and opportunities** both in economic and human development terms in **as much concrete figures and case studies as possible**;
- "Demystifying" climate change: *"environment"* → *"development"*
- To **facilitate policy dialogue, and promote coordination and capacity development** throughout the process of preparation, publication and follow up advocacy.

## Focus

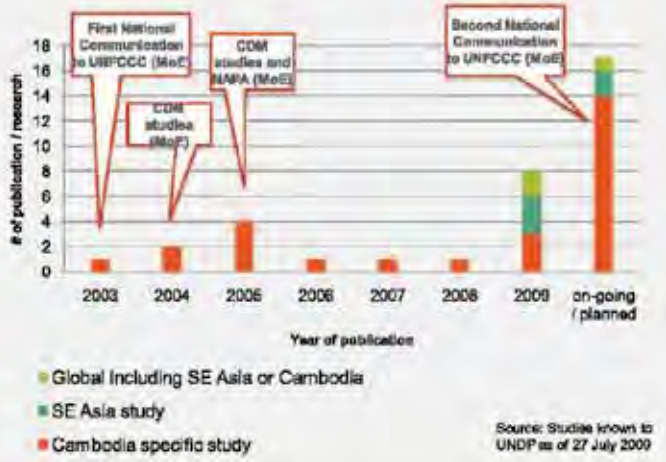
- Socio-economic and human development impact on **rural livelihood / rural sectors**
- Highlight opportunities / win-win scenario rather than threats

## Proposed outline

| Chapter "ingredients" (not final chapter titles) |
|---|
| Executive Summary |
| **Climate change – global overview and RGC's recognition** |
| **Climate change as economic and human development challenge:** general discussion |
| **What does climate change mean to Cambodia?:** Existing projection for the country |
| **Cambodia's HD indices analysis** - Cambodia's vulnerability analysed from HD perspective? |
| **Implications to rural livelihood** - Impacts across different livelihood assets(human, financial, natural, physical and social) as well as livelihood strategies |
| **Economic impact of climate change on selected sectors:** Agriculture, water resources, fisheries, health? |
| **Opportunities to turn CC into leverage for economic growth and sustainable development** |
| **Concrete information on how the adaptation actions and mitigation options can be financed or where technical references are found** |
| **Policy recommendations**<br>-Long-term policy recommendations on mitigation and adaptation<br>-Recommendations on immediate practical actions |

## # of known climate change related studies

with specific reference / relevance to Cambodia




## Linkage with existing studies & added value


- Analyzse impacts from human development angle
- Emphasis on economics & opportunities proposed
- Non-technical reference to wide audience
- Engages and develops capacity of national stakeholders throughout the process
- Communication strategy & sustained follow up

## Major steps of HDR preparation


Aim at publication within 2010

## NHDR 2010 Senior Advisory Group

| | Organisations represented |
|---|---|
| Government | • Supreme National Economic Council (SNEC)<br>• National Committee on Climate Change (NCCC)<br>• Ministry of Health<br>• Ministry of Women's Affairs |
| Academia | • Royal University of Phnom Penh |
| NGOs | • Oxfam America<br>•Star Kampuchea<br>• CEDAC<br>• NGO Forum |
| Private sector | • Khaou Chuly Group<br>• ACLEDA Bank |
| Development partners | • Danida<br>• UN<br>•UNDP |

## Thank you & Q&A / Discussion

Previous Cambodia NHDR 2007 can be found at:
http://www.un.org.kh/undp/insights-for-Action/

Fore more info on HDR in general and for all HDR database:
http://hdr.undp.org/en/

First National Forum on Climate Change
Royal Government of Cambodia
National Climate Change Committee

19-21 October 2009
Cambodia

# Overview on CoP-15: Key Elements

Mozaharul Alam
Regional Climate Change Coordinator
Regional Office for Asia and the Pacific

UNEP

UNITED NATIONS ENVIRONMENT PROGRAMME

## CoP 15: Key Issues and Discussion Streams

### Mitigation - Reduction of Greenhouse Gas Emission

- Ad-hoc Working Group on Kyoto Protocol (AWG-KP): emissions reduction required by Annex I Parties under the Kyoto Protocol in the subsequent commitment period (after 2012)
- Ad-hoc Working Group on Long-term cooperative Action (AWG-LCA)
  - b (i) - Measurable, reportable and verifiable nationally appropriate mitigation commitments or actions including quantified emission limitation and reduction objectives, by all developed country Parties.....
  - b (ii) - Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner;
  - B (iii) - Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries.....

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## CoP 15: Key Issues and Discussion Streams

### Adaptation

- Continued discussion under SBSTA and SBI
  - Nairobi Work Programme
  - Progress of Implementation of 1/CP.10
  - Maters Related to LDC – LDC Work Programme
  - Fourth Review of Financial Mechanism
- New discussion under Ad-hoc Working Group on Long-term cooperative Action (AWG-LCA)
  - Enhanced Action on Adaptation and Means of Implementation

### Finance and Investment

- Mitigation and Adaptation

### Technology Transfer and Capacity Building

- Mitigation and Adaptation

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## Bali Action Plan (BAP) – Full, Effective and Sustained Implementation of the Convention now, up to and beyond 2012


Bali, Bangkok, Accra, Poznan, Bonn, Nairobi, Bangkok, Barcelona, Copenhagen

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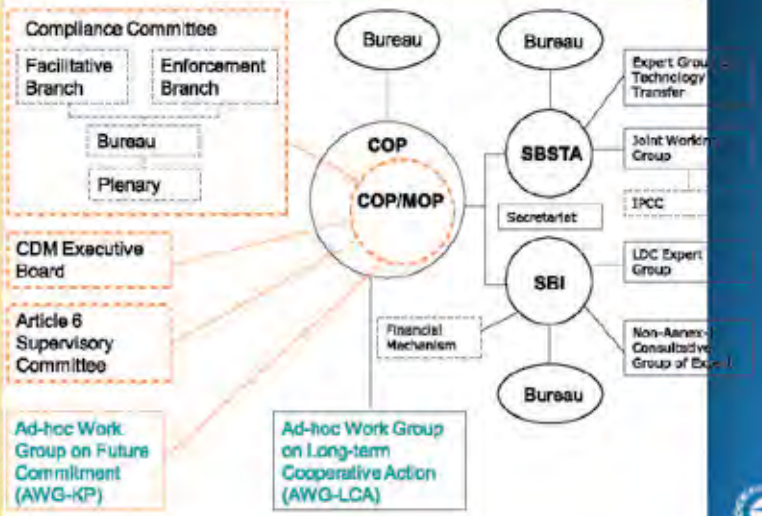
## Institutional Structure




## Bali Action Plan (BAP) – Full, Effective and Sustained Implementation of the Convention now, up to and beyond 2012

### Present Status

- Chair of the Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA) had Prepared Draft Negotiating Text for Bonn-2 Meeting based on submissions and views expressed by the Parties;
- Parties have inserted more of their views during Bonn-2 meeting and text became about 200 pages document;
- Bonn-3 meeting made an attempt to consolidate draft negotiating text
- Bangkok Climate Change Talk continues its effort to consolidate and streamline negotiating text and prepared non-paper to be discussed in Barcelona
  - A Shared Vision on Long-term Cooperative Action
  - Enhanced Action on Adaptation and its means of Implementation
  - Enhanced Action on Mitigation – non-paper on each issue
  - Enhanced Action on Finance, Technology and Capacity Building

## BAP: A Shared Vision on Long-term Cooperative Action

### Key Elements

- Nature of the Shared Vision
- A long-term global Goal
- Review of Shared Vision

### Discussions and Status

- New non-paper (paper 33) by Chair of the AWG-LCA

## BAP: Enhanced action on adaptation and its means of implementation

### Contents – Six Sub-sections

- A. Objectives, scope and guiding principles
  - Adaptation to adverse effects of climate change
  - Adaptation to the impact of the implementation of response measures
- B. Implementation of adaptation action
  - Giving priority to a groups of countries
  - Development of plan, contents of the plan
  - Conditionality issues
- C. Means of implementation
  - Activities to be supported
  - Finance
  - Technology
  - Capacity building

**BAP: Enhanced action on adaptation and its means of implementation**

**Contents – Six Sub-sections**

- D. [Risk reduction, management and sharing] [Risk management and risk reduction strategies, including risk sharing and transfer mechanism such as insurance] [Risk reduction and management]
  - Risk Reduction, management and prevention
  - Insurance
- E. Institutional arrangements (more in Chapter IV, section A.3)
  - Be fair, effective, efficient and transparent;
  - Be under the authority, and guidance of, and be fully accountable to, the COP;
  - Be supportive of national institutional arrangements;
  - Establishment of a Subsidiary Body for Adaptation
  - An expert group on adaptation under the subsidiary body for adaptation

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**BAP: Enhanced action on adaptation and its means of implementation**

**Contents – Six Sub-sections**

- F. [Monitoring and review of adaptation action and support] [Monitoring and review of enabled and supported adaptation action] [measures to facilitate adequate adaptation to climate change] [Review of progress]
  - Monitoring and review of support
  - Monitoring and review of action
  - Legally binding

UNEP

**Mitigation – Enhanced Action on Mitigation, and Second Commitment Period**

- AWG-LCA: a long-term goal for emission reductions as one issue of the "shared vision"
  - Developed countries commitment – MRV, comparability of efforts
  - Developing countries actions supported by Finance and Technology
    - Nationally Appropriate Mitigation Action (NAMA)
- AWG-KP: negotiating the emissions reduction required by Annex I Parties under the Kyoto Protocol in the subsequent commitment period (after 2012)
  - No significant progress
- Merging two track as a package deal
  - Future of existing mechanisms – CDM etc

UNEP

**BAP – Enhanced Action on Finance, Technology and Capacity Building**

Finance - Key Elements

- *Enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation, including, inter alia, consideration of:*
  - *i) Improved access to adequate, predictable and sustainable financial resources and financial and technical support, and the provision of new and additional resources, including official and concessional funding for developing country Parties;*
  - *ii) Positive incentives for developing country Parties for the enhanced implementation of national mitigation strategies and adaptation action;*
  - *iii) Innovative means of funding to assist developing country Parties that are particularly vulnerable to the adverse impacts of climate change in meeting the cost of adaptation;*

UNEP

**BAP – Enhanced Action on Finance, Technology and Capacity Building**

Finance - Key Elements

- *Enhanced action on the provision of financial resources and investment to support action on mitigation and adaptation and technology cooperation, including, inter alia, consideration of:*
  - *iv) Means to incentivize the implementation of adaptation actions on the basis of sustainable development policies;*
  - *v) Mobilization of public- and private-sector funding and investment, including facilitation of climate-friendly investment choices;*
  - *vi) Financial and technical support for capacity-building in the assessment of the costs of adaptation in developing countries, in particular the most vulnerable ones, to aid in determining their financial needs;*

**BAP – Enhanced Action on Finance, Technology and Capacity Building**

Finance - Key Issues

- *Additional investment and financial flows in 2030 to address climate change - 0.3 to 0.5% of global domestic product in 2030 and 1.1 - 1.7% of global investment in 2030*
- *Insufficient finance at present to address the future financial flows estimated to be needed for adaptation and mitigation*
- *For mitigation*
  - *Additional investment and financial flows of USD 200–210 billion - reduction of CO2 eq emissions by 25 per cent below 2000 levels in 2030.*
- *For adaptation*
- *Updated estimates of financial flows and investment needs for adaptation remain in the tens of billions, possibly hundreds of billions, of USD per year.*
- *No precise global figure is available at present and further analysis on this needs to be conducted.*

**BAP – Enhanced Action on Finance, Technology and Capacity Building**

Technology - Key Elements

- *d) Enhanced action on technology development and transfer to support action on mitigation and adaptation, including, inter alia, consideration of:*
  - *i) Effective mechanisms and enhanced means for the removal of obstacles to, and provision of financial and other incentives for, scaling up of the development and transfer of technology to developing country Parties in order to promote access to affordable environmentally sound technologies;*
  - *ii) Ways to accelerate deployment, diffusion and transfer of affordable environmentally sound technologies;*
  - *iii) Cooperation on research and development of current, new and innovative technology, including win-win solutions;*
  - *iv) The effectiveness of mechanisms and tools for technology cooperation in specific sectors;*

**BAP – Enhanced Action on Finance, Technology and Capacity Building**

Technology - Key Issues

- *Objective, scope and guiding principles*
- *Technology action plan*
- *TNA, Capacity Building and Enabling Environments*
- *Technology road maps*
- *Cooperative R&D*
- *Intellectual Property Rights (IPR)*
- *Incentive mechanism*
- *Technology Information*
- *Institutional arrangement*
- *Technology innovation centres*
- *Financing technology*

## BAP – Enhanced Action on Finance, Technology and Capacity Building

Capacity Building - Key Issues

- *Principles of capacity building*
- *Scope of capacity building support*
- *Institutional arrangements for capacity-building support*
- *Measurement of capacity-building support*
- *Provision of financial resources for capacity building support*

Mozaharul Alam
Regional Climate Change Coordinator
Regional Office for Asia and the Pacific
United Nations Environment Programme
UN Building, 2nd Floor, Block B
Rajdamnern Nok Avenue
Bangkok 10200, Thailand
Tel: +662-288-2601
Email: mozaharul.alam@unep.org

UNEP UNITED NATIONS ENVIRONMENT PROGRAMME

# Appendix 5. Biographies

## Day 1

### Introduction Session

**Mr. Mozaharul Alam (UNEP):** Mr. Mozaharul Alam has recently joined UNEP as Regional Climate Change Coordinator for Asia and the Pacific Region located in Bangkok. Before joining UNEP, he coordinated the climate change programme of the Bangladesh Centre for Advanced Studies (BCAS). He has conducted and coordinated significant amounts of research on climate change impacts, vulnerability and adaptation at national, regional and international levels. He has also designed and implemented community based adaptation projects in Bangladesh and provided technical inputs on Community Based Adaptation to Climate Change projects in African Countries. He has also contributed to the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) as a Contributing Author. He has been attending climate change negotiations since 2000 and in the last five years, attended climate change negotiations as a member of Bangladesh Delegations. He was also one of the coordinators of the G77 and China for the Adaptation Building Block under the Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA) under the Bali Road Map.

**Prof. Ian Noble (World Bank):** Prof. Ian Noble is Lead Climate Change Specialist at the World Bank with particular responsibility for the Bank's activities on adaptation to climate change. He has also worked with the Carbon Finance Unit on the design of the BioCarbon Fund and on emissions reductions through Reducing Emissions from Deforestation and Forest Degradation (REDD). Before coming to the World Bank in 2002, he was Professor of Global Change Research at the Australian National University and a senior contributor to the IPCC process.

**Dr. Juzhong Zhuang (ADB):** Juzhong Zhuang, PhD in Economics, is Assistant Chief Economist, Economics and Research Department, Asian Development Bank (ADB). He joined ADB in 1997. His main research interests include growth and income distribution; finance and early warning systems; and, more recently, the economics of climate change. He was Research Officer in the Suntory-Toyota International Center for Economics and Related Disciplines of the London School of Economics from 1992 to 1997. He graduated from Manchester University in the UK in 1992.

### Working Session 1: Climate Change Mitigation

**Ms. Bridget McIntosh (Carbon Bridge):** Ms Bridget McIntosh is the Managing Director of Carbon Bridge, a carbon company based in South East Asia. She leads a portfolio of carbon projects across the Asia Pacific region including wind, biogas, hydro, landfill gas, solar, biomass, and cement waste heat projects. She has experience in all the main international carbon processes, including the CDM, the Voluntary Carbon Standards and the Gold Standard. She worked with the Cambodian Climate Change Office at the Ministry of Environment and helped support the establishment of the Designated National Authority. She has more than a decade of experience in the carbon and renewable energy industry and six years' carbon experience in South East Asia, including working for the World Bank in Cambodia. She holds an honours degree in Environmental Engineering and has put her MBA on hold while she manages Carbon Bridge.

**Dr. Keo Omaliss (FA):** Dr. Keo Omaliss is Deputy Director of the Department of Wildlife and Biodiversity, and Focal Point for Reducing Emissions through Deforestation and Forest Degradation (REDD), Forestry Administration.

**Mr. Chheng Kimsun (FA):** Mr. Chheng Kimsun is Deputy Director General, Forestry Administration.

**Dr. Pham Manh Cuong (MARD, Vietnam):** Dr. Pham Manh Cuong is a Senior Forest and Environment Officer of the Department of Forestry (DoF) at the Ministry of Agriculture and Rural Development (MARD) and the national technical advisor for the REDD Programme in Vietnam. He takes the lead in designing Concept Notes and Programme Documents on climate change in the forestry sector of Vietnam, and the World Bank Forest Carbon Partnership Facility and the United Nations Collaborative Programme on Reducing Emission from Deforestation and Forest Degradation in Developing Countries (the UN-REDD). Dr. Pham received a Ph.D. Degree from the University of Goettingen, Germany in 2004. He has taken part in a series of programmes on forest management, climate change, forest law enforcement, governance and trade. Before joining the Department of Forestry, Dr. Pham worked more than 12 years at the National Forest Inventory and Planning Institute. He has great experience in forest monitoring, measurement and verification.

**Mr. Toch Sovanna (MIME):** Mr. Toch Sovanna holds a Master of Science in Renewable Energy from Naresuan University, Thailand (2000). He is currently the Director of the Department of Energy Technique of the Ministry of Industry, Mines and Energy. He also serves as a member of the ASEAN Board of Judges for New Energy and Renewable Energy as well as member of the Inter-Ministerial Working Group for the Clean Development Mechanism. He has more than 10 years' experience in renewable energy and energy efficiency.

**Mr. Iwan Baskoro (GERES):** Mr. Iwan Baskoro holds a Master of Public Administration. He has extensive working experience in a series of rural development programmes with emphasis on improved cooking stoves since 1991 in Indonesia, Vietnam and the Philippines. He has been working in Cambodia since the beginning of 1996 and is currently the Country Director of GERES Cambodia.

## Panelists

**Mr. Jossy Thomas (UNIDO):** Mr. Jossy Thomas has several years of experience in the Energy Sector, including 11 years in international technical cooperation in the area of renewable energy and climate change. He has been developing and implementing renewable energy-based technical assistance projects in many developing countries through UNIDO. Prior to joining UNIDO he was with the Energy Resources section on UNESCAP Bangkok.

**Mr. Jacob Jepsen (Danida):** Mr. Jacob Jepsen is counsellor at the Royal Danish Embassy–Danida. He is involved in climate change, private sector development, forestry, land, and the fisheries subsector. He is lead development partner in the Technical Working Group on Forest and Environment and the Technical Working Group on Fisheries. He represents development partners on the Senior Advisory Panel for the development of the Cambodia Human Development Report 2010, focusing on climate change. He has been in Cambodia since September 2008.

**Oknha Khaou Phallaboth:** Oknha Khaou Phallaboth is Co-Founder and President of Khaou Chuly Group, and Private Advisor to the Prime Minister.

**Mr. Adisorn Chieu:** Mr. Adisorn Chieu holds a Bachelor's Degree in Engineering from Chulalongkorn University in Thailand. Mr. Chieu has been the Executive Director of Angkor Kasekam Roongroeung Co., Ltd. since 1999 and the Managing Director of Angkor Bio Cogen Co., Ltd since 2004.

## Working Session 2: Climate Change Adaptation

**Mrs. Anja-Christine Beier (Sida):** Mrs. Anja-Christine Beier works on the helpdesk for Environment Assessment for the Swedish International Development Cooperation Agency (Sida), one of Sida's two helpdesks in the area of environment. Mrs. Beier has been working in development cooperation for more than 15 years within both the private sector and the governmental sector. As well, she was previously based in Cambodia for a Swedish NGO.

**Dr. Rizaldi Boer:** Dr. Rizaldi Boer has been a teaching staff member at the Department of Geophysics and Meteorology and Director of the Centre for Climate Risk and Opportunity Management (CCROM) of the Bogor Agricultural University in Indonesia for the period of 2009-2013. He received his PhD from the University of Sydney in 1994. Since 1995 he has been actively involved in many regional research activities related to climate variability and climate change. He is now also a member of the Task Force Bureau of the IPCC for the Greenhouse Gas Inventory. Since 2001, he has been frequently invited by the UNFCCC Secretariat to be part of the expert review team of the National Greenhouse Gas Inventory of Annex 1 countries.

**Prof. Tony McMichael:** Prof. Tony McMichael holds an Australia Fellowship from the National Health and Medical Research Council, is honorary professor in Climate Change and Human Health at the University of Copenhagen, and is an Honorary Fellow of the London School of Hygiene and Tropical Medicine. Prof. McMichael's primary research focus is on global climate change, environmental factors and human health. His pioneering research and writing on the health risks of climate change in the 1990s was combined with his central role in health risk assessment for the UN Intergovernmental Panel on Climate Change (IPCC). The IPCC received the Nobel Peace Prize in 2007. Prof. McMichael has been an advisor and consultant on environmental health issues to WHO, UNEP, the World Bank and other international bodies. He is currently Professor at the National Centre for Epidemiology and Population Health at the Australian National University in Canberra.

**Dr. Edward Hugh Allison (World Fish):** Dr. Edward Allison has a background in both fisheries science and international development. He has worked for the UK Department for International Development, and the FAO, and was a senior lecturer in environment and development at the University of East Anglia in the UK. He is currently Director of the Policy, Economics and Social Science group in the WorldFish Center, one of the institutes in the Consultative Group on International Agricultural Research. He also leads a team of climate change researchers at WorldFish.

**Mr. Bert Maerten (Oxfam International):** Mr. Bert Maerten is Oxfam International's Climate Change Campaign Leader. In this role he coordinates Oxfam's campaign for a fair and safe climate treaty in the run up to the Copenhagen summit in December. Previously, he oversaw regional and national-level campaigning on trade, agriculture and climate change in the East Asia region. He also managed various poverty reduction programmes in Vietnam, Cambodia and Laos, and oversaw a post-tsunami rehabilitation programme for older people in Aceh, Indonesia. He started his development career in Central Africa, studying the causes of the 1994 genocide in Rwanda. He has an academic background in international and development economics and is currently based in Bangkok, Thailand.

## Panelists

**Dr. Ian Noble (World Bank):** Dr. Ian Noble is Lead Climate Change Specialist at the World Bank, with particular responsibility for the World Bank's activities in adaptation to climate change. He has also worked with the Carbon Finance Unit on the design of the BioCarbon Fund and on Reducing Emissions through Deforestation and Forest Degradation (REDD). Before coming to the World Bank in 2002, he was Professor of Global Change Research at the Australian National University and a senior contributor to the Intergovernmental Panel on Climate Change (IPCC) process.

**Dr. Aminul Islam (UNDP Bangladesh):** Dr. M. Aminul Islam is the Assistant Country Director and Cluster Head for Environment and Disaster Management of UNDP Bangladesh. He is portfolio manager as well as initiator of a number of climate change adaptation projects in Bangladesh. He was also Team Leader of the Water Risk Mitigation Project in the Central Vietnam. Prior to joining UNDP, Dr. Islam taught environmental management

and climate change at public and private universities and served as an Environmental Scientist of the Flood Action Plan project of the Government of Bangladesh. He has contributed to several research studies in the area of climate change adaptation.

**Mr. Im Sophanna:** Mr. Im Sophanna is Vice Chief of Weather Monitoring Office, Ministry of Water Resources and Meteorology.

## Day 2

### Working Session 3: Towards a Low-Carbon Society

**Mr. Masakazu Ichimura (ESCAP):** Mr. Masakazu Ichimura is Chief of the Environment and Development Policy Section, Environment and Development Division, UN Economic and Social Commission for Asia and the Pacific (ESCAP). He has more than 20 years' extensive experience with ESCAP, starting in 1988, and over the years has worked as an expert on environmental policy matters.

**Dr. Georg Maue:** Dr. Georg Maue works for the German Federal Ministry for Environment, Nature Protection and Nuclear Safety in the Division for Environment and Energy Issues and Climate Policy. He graduated in Technical Environmental Engineering with a focus on pollution control. He works as a national expert on development and co-ordination of national and international climate policy.

**Mr. Jeroen Verschelling:** Mr. Jeroen Verschelling is a long term renewable energy enthusiast. Since completing his engineering studies in 1994, Jeroen has worked on renewable energy and energy conservation projects in Europe, Africa and Asia. Since 2005, Jeroen has been active as co-founder and director of Kamworks. He currently lives in a 100 percent solar powered house (no grid connection) with his wife and three young children in Kien Svay District, Kandal Province.

**Koch Sovath (MoE):** Mr. Koch Sovath is Deputy Director General, Ministry of Environment.

**Dr. Andrew Mears (UNDP):** Dr. Andrew Mears holds a PhD from the University of Technology Sydney, Australia, and a Master of Engineering (Research), from the University of Newcastle, Australia. Dr Mears has more than 15 years of experiences in climate change adaptation and mitigation covering Pacific, East and Southern Africa, and South East Asia. His focus has primarily been on the linkages between Climate Change and livelihoods with various roles in the provision of technical assistance, project and programme development, policy, management, and monitoring and evaluation. Presently Dr Mears is the Climate Change Advisor with UNDP in Cambodia. Previously, he held positions as Chief Technical Advisor for Renewable Energy with UNDP in Botswana and Energy Advisor for the World Bank in Papua New Guinea. Dr Mears has also worked extensively with NGOs including ITDG, APACE and Melanesian Farmers First Network and as an Independent Consultant for projects for various development organizations, including the World Bank, UNDP and AusAID.

**Mr. Dominique Catry:** Mr. Dominique Catry holds a Master in Electrical Engineering HEI France (1964) and an MBA (1965) IPA University of Lille (France). He was a Physics Teacher at Lycee Sisowath (Phnom Penh, Cambodia) from 1965 to 1967. Mr. Catry joined Comin Khmere as Design Section Manager in 1967-68, and became the Comin Tech General Manager in 1970 until 1973. From 1973 to 1978, he was Vice President for the Environmental Control International Company, in Tokyo, Japan, and Director for Asia of Merlin Gerin (Groupe Schneider Electric, France) in Singapore from 1979 to 1991. He is the Comin Asia Group founder and chairman since 1992 [Comin Asia (Singapore), Comin Vietnam, Comin Thai and Comin Khmere (Cambodia)]. Mr. Catry has also been counsellor for French Foreign Trade since 1996 and is Founder and Chairman of the French-Cambodian Chamber of Commerce (2000-2004). He holds the title Chevalier Legion d'Honneur (France) and Chevalier Ordre Sahametrei (Cambodia).

## Working Session 4: NSDP, Climate Change, and Aid Effectiveness and Coordination

**Presenters**

**Mr. Poch Sovanndy (MoP):** Mr. Poch Sovanndy is Deputy Secretary General, Ministry of Planning

**H.E. Chhieng Yanara (CRDB/CDC):** H.E. Mr. Chhieng Yanara is Secretary General of the Cambodia Rehabilitation and Development Board and Deputy Secretary General of the Council for Development of Cambodia.

**Panelists**

**Mr. Jacob Jepsen (Danida):** Mr. Jacob Jepsen is counsellor at the Royal Danish Embassy–Danida. He is involved in climate change, private sector development, and the forestry, land, fisheries subsectors (lead development partner in the Technical Working Group on Forest and Environment and the Technical Working Group on Fisheries). He represents development partners on the Senior Advisory Panel for the development of *Cambodia Human Development Report 2010*, focusing on climate change. He has been in Cambodia since September 2008.

**Mr. Karl-Anders Larsson (Sida):** Mr. Karl-Anders Larsson has a background in economics and has worked for Sida for almost 30 years, including Sida HQ, Africa and Asia. In 2004-2008, he was Sida's focal point for aid effectiveness and participated in the work of OECD-DAC, including the conferences in Paris and Accra. He has been based in Phnom Penh for one year, with responsibility for aid effectiveness. Mr. Larsson is involved in preparing the new Swedish Climate Initiative in Cambodia.

## Roundtable 1: Biodiversity and Climate Change

**Dr. Robert Mather (IUCN):** Dr. Robert Mather has a PhD from Cambridge University, awarded in 1992, for field work on primate ecology in Central Kalimantan, Indonesia. Dr Mather joined WWF in 1993 to coordinate a large project for the Huay Kha Kaeng-Thung Yai Naresuan World Heritage site, in western Thailand, and subsequently established the WWF Thailand Office in 1995. During this time he led projects working on conservation of elephants, tigers, and marine turtles, as well as a number of environmental education programmes and protected areas management work. He also initiated a number of innovative partnerships with the private sector. Dr Mather started to work on Mekong issues in 2001, and from 2005-2008 he led WWF's Living Mekong Programme based in Vientiane, Lao PDR. During this time, the programme enjoyed rapid growth and a multimillion dollar annual budget, focused on environmental issues in hydropower development, road construction in headwaters and floodplain areas, conservation of priority sites throughout the basin from the Tibetan Plateau to the Delta, Mekong Dolphins, Mekong Giant Catfish and the linkages between local livelihoods and sustainable management of wetlands. He joined IUCN in 2008 and is now responsible for IUCN's programme in three countries – Lao PDR, Cambodia and Vietnam.

## Roundtable 2: Gender and Communications, Education and Advocacy

**Mr. Brian Lund (Oxfam America):** Mr. Brian Lund B.Ag.Sci, MBA, is Oxfam America's Regional Director for East Asia. His team supports a programme portfolio that includes rural livelihoods, access to natural resources (extractive industries) and humanitarian response. Mr. Lund began his career in natural resource management and agricultural in Australia 25 years ago. During the past 10 years he has worked in the Mekong countries of Vietnam, Cambodia and Lao PDR and is currently based in Phnom Penh.

**Ms. Serena Fortuna (UNEP):** Ms. Serena Fortuna is the focal point for Climate Change Adaptation in the United Nations Environment Programme (UNEP) Regional Office for Asia and the Pacific (ROAP). In addition to dealing with topics and projects related to climate change adaptation, including the Regional Adaptation Knowledge Platform for Asia and the Regional Climate Change Adaptation Network, Ms. Fortuna is a member of the UNEP ROAP team on Disasters and Conflicts. Before joining UNEP in 2007, Ms. Fortuna worked for nearly six years in FAO, on various initiatives related to assessments of world mangroves, the role of coastal forests in protecting against natural hazards, sustainable forest management, and forest protection and health, and with IUCN, where she mainly worked on the Mangroves for the Future (MFF) – a coastal management initiative currently working in various Indian Ocean countries.

**Mr. Khim Lay (UNDP):** Mr. Khim Lay's main background is in social and conservation forestry. He has extensive experience in the areas of biodiversity conservation and protected areas management, climate change adaptation, rural energy, and sustainable land and forest management. He has been with UNDP Cambodia for more than eight years and is currently an Assistant Country Director and Team Leader of the Environment and Energy Unit of UNDP.

## Plenary Session: The Road towards Copenhagen - COP-15

**Mr. Mozaharul Alam (UNEP):** Mr. Mozaharul Alam has recently joined the UNEP as Regional Climate Change Coordinator for Asia and the Pacific Region located in Bangkok. Before joining UNEP, he coordinated the climate change programme of Bangladesh Centre for Advanced Studies (BCAS). He has conducted and coordinated significant amounts of research on climate change impacts, vulnerability and adaptation at national, regional and international levels. He has also designed and implemented community-based adaption projects in Bangladesh and provided technical inputs on Community Based Adaptation to Climate Change project in African Countries. He has also contributed to the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) as a Contributing Author. He has been attending climate change negotiations since 2000 and in the past five years has attended climate change negotiations as a member of Bangladesh Delegations. He was also one to the coordinators of the G77 and China for the Adaptation Building Block under Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA) under the Bali Road Map.

# APPENDIX 6. Participant list

| No | Name | Position | Organization |
|---|---|---|---|
| 1. | Dr. Ancha Srinivasan | Co-mission team leader and Senior Climate Change Specialist | Asian Development Bank |
| 2. | Brett Baccat | Advisor | AusAid |
| 3. | Mr. Jacob K. Jepsen | Counsellor, Royal Danish Embassy | Denish Embassy (Danida) |
| 4. | Mr. Lic Vuthy | Program Officer – Forestry, Royal Danish Embassy | Denish Embassy (Danida) |
| 5. | Mr. Koen Everaert | Attaché Cooperation | Europen Commission |
| 6. | Sotha Ros | Project Coordinator | Food & Agriculture Organization |
| 7. | Ms. Anja -Christina-Beier | Sida's Helpdesk for Environment | Sweden (Sida) |
| 8. | Ms. Vlvila Alessan | | Sweden (Sida) |
| 9. | Mr. Douglas Broderick | UN Resident Coordinator | UN System |
| 10. | Dr. Andrew Mears | Climate Change Advisor, Environment & Energy | UNDP |
| 11. | Ms. Kumi Furayashiki | Coordinator, National Human Development Report (NHDR) Insights for Action (IFA) Project | UNDP |
| 12. | Mr. Cecilia Aipira | | UNDP |
| 13. | Mr. Lay Khim | Head Environment and Energy Unit | UNDP |
| 14. | Ms. Macarena Aguilar | Programme Communication Advisor, Communication Unit | UNDP |
| 15. | Ms. Bopha Seng | | UNDP |
| 16. | Mr. Rogier Van Mansvelt | | UNDP |
| 17. | Ms. Keo Kalyan | Programme Analyst | UNDP |
| 18. | Ms. Aimee Brown | Public Information Officer | UNDP |
| 19. | Ms. Katia Timmermans | | UNDP |
| 20. | Ms. Serena Fortuna | Associate Programme Officer, Regional Office for Asia and the Pacific | UNEP |
| 21. | Mr. Masakazu Ichimura | Chief, Environment and Development Policy Section, Environment and Sustainable Development Division | UNESCAP |
| 22. | Mr. Sok Narin | Head of UNIDO Operation | UNIDO |
| 23. | Mr. Jossy Thomus | | UNIDO |

| No | Name | Position | Organization |
|---|---|---|---|
| 24. | Mr. Michael Scott | | United Kingdom (DFID) |
| 25. | HE Mr. Andrew Mace | UK Ambassador | United Kingdom |
| 26. | Lesley Saunderson | | United Kingdom |
| 27. | Bert Mauter | | United Kingdom |
| 28. | Sanran Toy | | US (USAID) |
| 29. | Ronit K.Gorard | Private Ent. & Environment | USAID |
| 30. | Ashwin Faminathan | | World Health Organization |
| 31. | Geunyeag You | | World Health Organization |
| 32. | Kathya Baven | | World Health Organization |
| 33. | Mr. Bunlong Leng | Environmental Specialist | World Bank |
| 34. | Mr. Ian Noble | Lead Climate Specialist | World Bank |
| 35. | Dr. Nasir Hassan | Engineer | World Health Organization |
| 36. | Mom Nada | Deputy Director General | |
| 37. | Mr. Pang Lyda | | 7 Makara Commune |
| 38. | Kim Sun | Director General | |
| 39. | Prum Din | Director | |
| 40. | Muth Chanthy | | |
| 41. | Sim Tola | Commune Councillor | 7 Makara Commune |
| 42. | Soeur Sam Ang | Commune Councillor | 7 Makara Commune |
| 43. | Yim Sovan | Commune Councillor | 7 Makara Commune |
| 44. | Khan Sok Mean | Commune Councillor | 7 Makara Commune |
| 45. | Yim Thavy | Commune Councillor | 7 Makara Commune |
| 46. | Ek Morny | Commune Councillor | 7 Makara Commune |
| 47. | Chhor Thanat | | Apsara Authority |
| 48. | Dy Ki Dean | Official | Tonle Sap Authority |
| 49. | Ms. Mak Solieng | Consultant | Cambodia National Mekong Committee |
| 50. | Kul Vatthana | Deputy Secretary General | Cambodian National Mekong Committee |
| 51. | Teo Sok Khoeun | Project Manager, CBDP | Cambodian Red Cross |
| 52. | Leab Dam | CBDP Trainer | Cambodian Red Cross |
| 53. | Ear Sann | Commune Councillor | Chamkamorn Commune |

| No | Name | Position | Organization |
|---|---|---|---|
| 54. | Tun Sam Lout | Commune Councillor | Chamkarmorn Commune |
| 55. | Mai Mom | Commune Councillor | Chankamorn Commune |
| 56. | Heang Soyada | | CMU |
| 57. | Douy Thov | Deputy Director Secretary | Council for the Development of Cambodia |
| 58. | Sang Chea Thy | Deputy Director | Council of Ministers |
| 59. | Kao Sarorn | Chief of Office | Council of Ministers |
| 60. | Men Sery | Director | Council of Phnom Penh |
| 61. | Hy Chhay | | Dangkor Commune |
| 62. | Pen Choeun | Council | Dangkor Commune |
| 63. | Bun Chan | | Dangkor Commune |
| 64. | Keang Tha | Commune Councillor | Dangkor Commune |
| 65. | Im Thavy | Commune Councillor | Dangkor Commune |
| 66. | Boeul Kosal | Director of Commune Council | Dangkor Commune |
| 67. | Ek Yan Ny | Commune Councillor | Daun Penh Commune |
| 68. | Ta.Keakrouk Phoan | Commune Councillor | Daun Penh Commune |
| 69. | Chhim Dina | Commune Councillor | Daun Penh Commune |
| 70. | Te Bo | Commune Councillor | Daun Penh Commune |
| 71. | So Immonichoth | Deputy Director | DHRW/MOW RAM |
| 72. | Chiek Ang | Director | DoEPP |
| 73. | Kruy Sovann | Commune Councillor | Daun Penh Commune |
| 74. | Chan Bondet | Commune Councillor | Daun Penh Commune |
| 75. | Leang Yi | Commune Councillor | Daun Penh Commune |
| 76. | Chea Nguan | Deputy Director of CNM | ENM/Ministry of Health |
| 77. | Khoun Dara | Deputy Director | Phnom Penh Environmental Department |
| 78. | Em Puty | Deputy of Director | Fishery Administration |
| 79. | Keo Omaliss | Deputy Director | Forest Administration |
| 80. | Choeng Hong Narith | Deputy Director of Researcher Section | Forest Administration |
| 81. | Samreth Vanna | Deputy Director | Forest Administration |
| 82. | Chet Sarun | Deputy Director | Headquarter |
| 83. | Kong Veasna | Officer of ICBD | ICBD, Ministry of Environment |

| No | Name | Position | Organization |
|---|---|---|---|
| 84. | Angda Asoeuono | | Indonesian Embassy |
| 85. | Om Sovanna | QA Director | International University |
| 86. | Yit Sokea | Lecturer | ITC |
| 87. | An Phaly | Commune Councillor | Khan 7 Makara |
| 88. | Din Norin | | MAFF |
| 89. | Prum Sophean | Commune Councillor | Mean Chey Commune |
| 90. | Chum Maren | Commune Councillor | Mean Chey Commune |
| 91. | Ang Siphan | Commune Councillor | Mean Chey Commune |
| 92. | Lorn Bat | Commune Councillor | Mean Chey Commune |
| 93. | Mok Sinat | Commune Councillor | Mean Chey Commune |
| 94. | Em Sok Leang | Commune Councillor | Mean Chey Commune |
| 95. | Soun Rasy | Deputy Director | Council of Ministers |
| 96. | Pheav Sovuthy | Acting Director | Ministry of Agriculture, Forestry an Fisheries |
| 97. | Chan Nora | Secretary of State | Ministry of Commerce |
| 98. | Pich Chan | Deputy Director | Ministry of Commerce |
| 99. | Khuon Samnang | Technical Officer | Ministry of Commerce |
| 100. | Ben Rithy | Deputy Director General | Ministry of Cults and Religious Affairs |
| 101. | Ok Sophun | Director General | Ministry of Culture |
| 102. | Pen Sophea | Deputy Director | Ministry of Economy and Finance |
| 103. | Srun Dara | Secretary of State | Ministry of Economy and Finance |
| 104. | In Kim Srun | Deputy Director General | Ministry of Education, Youth and Sports |
| 105. | Hak Seng Ly | Under Secretary of State | Ministry of Education, Youth and Sports |
| 106. | Va Vuthy | Deputy Director | Ministry of Education, Youth and Sports |
| 107. | Ly Sophorn | Deputy Director | Ministry of Environment |
| 108. | Phoung Sothy | Head of Office | Ministry of Environment |
| 109. | Ken Bo Preang | Vice Chief of Office | Ministry of Environment |
| 110. | Sou Sovouth | Advisor to Minister | Ministry of Environment |
| 111. | Chim Ratha | Inspector | Ministry of Environment |

| No | Name | Position | Organization |
|---|---|---|---|
| 112. | Sophal Lasca | Vice Chief of Office | Ministry of Environment |
| 113. | Uy Kamal | Head of Office | Ministry of Environment |
| 114. | Ken Serey Rotha | Deputy Director General | Ministry of Environment |
| 115. | Eang Chetra | Director of Department | Ministry of Environment |
| 116. | Yin Bunneang | Deputy Director | Ministry of Environment |
| 117. | Ou Sun Van | Under Secretary of State | Ministry of Environment |
| 118. | Thuk Kroeun Vutha | Secretary of State | Ministry of Environment |
| 119. | Ung Seng | Advisor | Ministry of Environment |
| 120. | Sok Khom | Deputy Director | Ministry of Environment |
| 121. | Chhea Marith | Director of Department | Ministry of Environment |
| 122. | Sao Sovannara | | Ministry of Environment |
| 123. | Sam Khandy | Deputy Director General | Ministry of Environment |
| 124. | Chea Chan Thou | Deputy Director | Ministry of Environment |
| 125. | Heng Naret | Director of Department | Ministry of Environment |
| 126. | Chou Somony | Assistant | Ministry of Environment |
| 127. | Kim Nong | Director General | Ministry of Environment |
| 128. | Sok Ponlok | Official | Ministry of Environment |
| 129. | Tin Ponlok | National Project Coordinator | Second National Communication to UNFCCC Project |
| 130. | Sum Thy | Director of Department | Ministry of Environment |
| 131. | Khoun Theavy | Director of Department | Ministry of Environment |
| 132. | Vong Seang Kong | | Ministry of Environment |
| 133. | Hak Channy | Inspector | Ministry of Environment |
| 134. | Blong Setha | Vice Chief of Office | Ministry of Environment |
| 135. | Chhun Siha | Secretary | Ministry of Environment |
| 136. | Sem Saroeun | Director General | Ministry of Environment |
| 137. | Uk Siha | Deputy Director General | Ministry of Environment |
| 138. | Khiev Mut | Secretary of State | Ministry of Environment |
| 139. | Si Ramony | Director of Department | Ministry of Environment |
| 140. | Yem Bonarent | | Ministry of Environment |
| 141. | Heng Chanthoun | Deputy Director | Ministry of Environment |
| 142. | So Puthea | Chief office | Ministry of Environment |

| No | Name | Position | Organization |
|---|---|---|---|
| 143. | Yin Samray | Deputy Director | Ministry of Environment |
| 144. | Sim Sothy | | Ministry of Environment |
| 145. | Dr. Chhun Vannak | Deputy Director General for Inspection | Ministry of Environment |
| 146. | Koch Savath | Deputy Director General | Ministry of Environment |
| 147. | H.E. Heng Phearith | Director General | Ministry of Environment |
| 148. | Srey Marona | Director | CBNRM-LI |
| 149. | Catherine Benson | PMCR Office | Ministry of Environment |
| 150. | Chann Rotana | Deputy Director | Ministry of Foreign Affairs and International Cooperation |
| 151. | Soth Sothun | Under Secretary of State | Ministry of Foreign Affairs and International Cooperation |
| 152. | Nghet Sovann | Deputy Director | Ministry of Health |
| 153. | Ung Sama An | | Ministry of Health |
| 154. | Kol Hero | | Ministry of Health |
| 155. | Kate Brock | Consultant | Ministry of Health |
| 156. | Sea Huong | Secretary of State | Ministry of Health |
| 157. | Thach Sokiryda | Deputy Director of Health Protection | Ministry of Health |
| 158. | Sok Kanha | Deputy Director | Ministry of Health |
| 159. | Sorn Narun | Vice Chief of Office | Ministry of Health |
| 160. | Sat Samy | Secretary of State | Ministry of Industry, Mines and Energy |
| 161. | Nuon Chanan | Deputy Director | Ministry of Industry, Mines and Energy |
| 162. | Chiv Hour | Deputy Director | Ministry of Industry, Mines and Energy |
| 163. | Victor Jona | Deputy Director General | Ministry of Industry, Mines and Energy |
| 164. | Be Pitou | Deputy Director | Ministry of Industry, Mines and Energy |
| 165. | Toch Sovanna | Director of Department | Ministry of Industry, Mines and Energy |
| 166. | Thou Peou | Advisor | Ministry of Information |
| 167. | Heang Suyaro | Official | Ministry of Information |
| 168. | Srun Vong Vannak | Under Secretary of State | Ministry of Interior |

| No | Name | Position | Organization |
|---|---|---|---|
| 169. | So Dany | Deputy Director | Ministry of Justice |
| 170. | Bin Sambath Tharath | Under Secretary of State | Ministry of Land Management, Urban Planning and Construction |
| 171. | Bak Chanphal | Deputy Director General | Ministry of Land Management, Urban Planning and Construction |
| 172. | Chhem Sokun | Deputy Director General | Ministry of Land Management, Urban Planning and Construction |
| 173. | Nuth Chan Sokha | Under Secretary of State | Ministry of Planning |
| 174. | Oeung Sokun | Chief of Office | Ministry of Planning |
| 175. | Sok Theary | Deputy Director | Ministry of Planning |
| 176. | Leng Thun Yuthea | Under Secretary of State | Ministry of Public Works and Transport |
| 177. | Seng Limeng | Under Secretary of State | Ministry of Rural Development |
| 178. | Nov Ponlok | Deputy Director General | Ministry of Rural Development |
| 179. | Ly Savuth | Deputy Director General | Ministry of Rural Development |
| 180. | Kouch Sophary | Deputy Director General | Ministry of Social Affairs |
| 181. | Morm Ratha | Deputy Director | Ministry of Tourism |
| 182. | Seth Chantheunth | Technical Officer | Ministry of Tourism |
| 183. | Kim Bornnara | Deputy Director, Department of Planning | Ministry of Tourism |
| 184. | Pech Sda Serey | Chief of Office | Ministry of Vocational Training and Youth Rehabilitation |
| 185. | Bin Chan Mony | Vice Chief of Office | Ministry of Water Resources and Meteorology |
| 186. | In Vithureak | Under Secretary of State | Ministry of Water Resources and Meteorology |
| 187. | Sao Monyreaksmey | Technical Officer | Ministry of Water Resources and Meteorology |
| 188. | Kheua Sokhorn | Assistant of Secretary of State | Ministry of Water Resources and Meteorology |
| 189. | Chut Leang Vanna | Deputy Director General | Ministry of Women's Affairs |
| 190. | Chuk Morny | Deputy Director General | Ministry of Public Works and Transport |
| 191. | Stong Kea | Consultant | Ministry Rural of Development |
| 192. | Long Saravuth | Director of Department | Ministry of Water Resources and Meteorology |
| 193. | Kim Vatanak Thida | Deputy Chief of Cabinet | Municipality of Phnom Penh |

| No | Name | Position | Organization |
|---|---|---|---|
| 194. | Phorn Channa | Assistant | National Assembly |
| 195. | Keo Vy | Deputy Director | National Committee for Disaster Management |
| 196. | Ky Bunavuth | | National Committee Disaster Management |
| 197. | Sao Sithoun | Lecturer | Pañasatra University |
| 198. | Nop Channy | Director | Kratie Provincial Department of Environment |
| 199. | Chhay Youb | Director | Battambang Provincial Department of Environment |
| 200. | Yim Ly | Director | Banteay Meanchey Provincial Department of Environment |
| 201. | Nao Bunthorn | Director | Kampong Chhnang Provincial Department of Environment |
| 202. | Eang Bunthoeun | Deputy Director | Kampong Thom Provincial Department of Environment |
| 203. | Suy Thea | Director | Kampot Provincial Department of Environment |
| 204. | Pan Bunthoeun | Director | Kampong Cham Provincial Environmental Department |
| 205. | Heang Koun | Director | Kampong Speu Provincial Department of Environment |
| 206. | Chey Pich Chetra | Director | Koh Kong Provincial Department of Environment |
| 207. | Kong Sophal | Director | Kampot Provincial Department of Environment |
| 208. | Noum Phat | Director | Kandal Provincial Department of Environment |
| 209. | Ros Sokunthea | Vice Chief of Office | MondulKiri Provincial Department of Environment |
| 210. | San Thoeun | Director | Pailin Provincial Department of Environment |
| 211. | San Thoeun | Director | Pailin Provincial Department of Environment |
| 212. | Ros Marady | Deputy Director | Pursat Provincial Department of Environment |
| 213. | Khouy Khun Chanrath | Director | Preah Vihear Provincial Department of Environment |
| 214. | Im Choeun | Director | Prey Veng Provincial Department of Environment |

| No | Name | Position | Organization |
|---|---|---|---|
| 215. | Chou Sopheak | Director | Ratanakiri Provincial Department of Environment |
| 216. | Lun Kanel | Director | Siem Reap Provincial Department of Environment |
| 217. | Samot Sothearith | Deputy Director | Sihanouk Provincial Department of Environment |
| 218. | Eng Phyrun | Officer | Stueng Treng Provincial Department of Environment |
| 219. | He San | Deputy Director | Svay Rieng Provincial Department of Environment |
| 220. | Men Khav | Director | Takeo Provincial Department of Environment |
| 221. | Nghor Hour | Director | Uddar Meanchey Provincial Department of Environment |
| 222. | San Vibol | Researcher | Royal University of Phnom Penh |
| 223. | Va Dany | Head, Department of Environmental Sciences | Royal University of Phnom Penh |
| 224. | Chhen Nyda | Lecturer | Royal University of Phnom Penh |
| 225. | Kao Saravuth | Commune Councillor | Russei Keo Commune |
| 226. | Sim Sek Krehya | Commune Councillor | Russei Keo Commune |
| 227. | Tim Sokhon | Commune Councillor | Russei Keo Commune |
| 228. | Huoy Sochivanny | Commune Councillor | Russei Keo Commune |
| 229. | Yav Thoeun | Commune Councillor | Russey Keo Commune |
| 230. | Prak Channa | Commune Councillor | Russey Keo Commune |
| 231. | Vann Saly | Commune Councillor | Russey Keo Commune |
| 232. | Phoung Sophorn | Commune Councillor | Russey Keo Commune |
| 233. | Chao Austa La | Commune Councillor | Russey Keo Commune |
| 234. | Phem Phorn | Commune Councillor | Sen Sok Commune |
| 235. | Vong Slout Dy | Commune Councillor | Sen Sok Commune |
| 236. | Kroham Pany | Commune Councillor | Sen Sok Commune |
| 237. | Chhum Chom | Commune Councillor | Sen Sok Commune |
| 238. | Cheas Chun | Commune Councillor | Sen Sok Commune |
| 239. | Chhean Sokhean | Commune Councillor | Sen Sok Commune |
| 240. | Lam Ra | Commune Councillor | Sen Sok Commune |
| 241. | Khut Sakhoeun | Commune Councillor | Sen Sok Commune |

| No | Name | Position | Organization |
|---|---|---|---|
| 242. | Hang Davy | Director | Senate |
| 243. | Ang Pheakdey | Assistant | Senate |
| 244. | Sim Hak | Commune Councillor | Toul Kok Commune |
| 245. | Peou Vorn | Commune Councillor | Toul Kok Commune |
| 246. | Ven Sinoun | Commune Councillor | Toul Kok Coummune |
| 247. | Lim Hok | Commune Councillor | Toul Kok Coummune |
| 248. | Sum Rithy | Commune Councillor | Toul Kork Commune |
| 249. | Sim Sophong | Commune Councillor | Toul Kork Commune |
| 250. | Vun Si Oun | Commune Councillor | Toul Kork Commune |
| 251. | Ngoun Soksan | | University of Cambodia |
| 252. | Lom Akrun | | University of Cambodia |
| 253. | Ms. Prak Baureaksmey | Program and Grants Manger | ActionAid |
| 254. | Mr. Bou Vorsak | Acting Programme Manager | Birdlife International in Indochina |
| 255. | Naing Phyrun | Research Assistant | Cambodia Development Resource Institute |
| 256. | Ty Channa | Head of Training & Information Center | CARDI |
| 257. | Yi Kim Than | Country Director | CEDAC |
| 258. | Mr. Seng Bunra | Program Coordinator | Conservation International |
| 259. | Seug SokSan | Regional Country Representative | CSARO |
| 260. | Mr. Carsten Trier.Hoj | Journalist | Dan Church Aid |
| 261. | Youg Kamra | Country Director | Doeum Ampil Newspaper |
| 262. | Mr. Emily Woodfield | Communication Officer | FFI |
| 263. | Ms. Kristina Hermelin | Director | Forum Syd |
| 264. | Auan Chenng | Country Director | GERES |
| 265. | Mr. Iwan Baskoro | Director | GERES |
| 266. | Kairan Siuail | Head Country Group 1 | HSK |
| 267. | Dr. Robert J Mather | IUCN Lao PDR | IUCN |
| 268. | Kong Kimsreng | Senior Programme Officer | IUCN |
| 269. | Mr. Peter Neil | Coordinator Regional Forest Programme & Climate Change Focal Point | IUCN Lao PDR |
| 270. | Touch Sokun | Assistant to Parliament Members | National Assembly |

| No | Name | Position | Organization |
|---|---|---|---|
| 271. | Lam Sao Leang | Project Coordinator | NBP |
| 272. | Ponn Narith | | NCDM |
| 273. | Mr. Chhith Sam Ath | Executive Director | NGOs Forum |
| 274. | Mona Laczo | Deputy Regional Director | Oxfam |
| 275. | Mr. Nop Polin | National Climate Change Officer | Oxfam America |
| 276. | Vieky Rateau | | Oxfam American |
| 277. | Amanda Bradly | | Pact |
| 278. | Rau Masou | Director | Pact |
| 279. | Bernard Lang | Director | Raintrust Foundation |
| 280. | David Plattner | Chairman | Raintrust Foundation |
| 281. | Tep Chea Rin | Volunteer | Sarika |
| 282. | Mr. Tep Boonny | Executive Director | Save Cambodia's Wildlife |
| 283. | Ho Doremy | Marketing | SME Renewable |
| 284. | Mr. Rin Seyha | Director | SME Renewable Energy Ltd. |
| 285. | Sin Chan Sereivutha | Deputy Director General | SSCA |
| 286. | Meng Nghy | Assistant | SSCA |
| 287. | Chhak Lim Chheang | Volunteer | VOD |
| 288. | Mack Liter | Director | WCS |
| 289. | Mr. Suwanna Gauntlett | Country Director | Wildlife Alliance |
| 290. | Hor Sopheap | | |
| 291. | Karen Leigh | Journalist | Cambodia Daily |
| 292. | Tran Ngol Long | Reporter | VNA |
| 293. | Khang Soeung | Staff | CIYA |
| 294. | Mr. Dominique Carty | Chairman | Comin Khmer |
| 295. | Oknha Khaou Phallaboth | President | Khaou Chuly Group |
| 296. | Long Sokha | | OCM |
| 297. | Ly Sok Heng | Reporter | Pop Magazine |
| 298. | In Chhay | | RNK |


**MINISTRY OF ENVIRONMENT**

No. 48, Preah Sihanouk Blvd, Tonle Bassac, Chamkar Morn,
P.O. Box 12301, Phnom Penh, Cambodia
Tel: 023 427 894
Fax: 023 427 844
E-mail: moe-cabinet@camnet.com.kh
Website : www.moe.gov.kh