

PN-ACQ-611



# Philippines Climate Change Mitigation Program

*A Joint Program of the*



Philippines Department of Energy



US Agency for International Development

## FINAL REPORT

### CLIMATE CHANGE AND DEVELOPMENT WORKSHOP

March 27-30, 2000

Manuel M. Lopez Development Center  
Antipolo City, Philippines



Prepared by the:

**Harvard Institute for International Development**

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## I. INTRODUCTORY REMARKS

The Philippines is an archipelago situated above the equator in the Southeast Asian region. Its approximately 7,100 islands, of which most are small and uninhabited, experience a tropical marine climate with only wet and dry seasons. Its total land area is almost 300,000 square kilometers, characterized by one of the longest coastlines in the world. Although it is only the 57<sup>th</sup> largest country in the world, it ranks 14<sup>th</sup> in terms of population. With a poverty incidence of approximately 32.1%, the Philippines' main priorities are economic development and poverty alleviation.

In view of these and other factors, the Philippines is particularly vulnerable to environmental changes. As Harvard University Professor Michael B. McElroy noted, the country is vulnerable to such changes whether these arise as a result of natural forces such as the eruption of Mt. Pinatubo or as a consequence of a change in climate induced by emissions of greenhouse gases.

Consequently, climate change issues and impacts are of great concern to the Philippines which has been a leading voice among developing countries in relevant international fora. Philippine negotiators have been prominent representatives of the Group of 77 at the meetings of the Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) as well as in the meetings of the UNFCCC's subsidiary bodies. On the domestic front, the Philippines has undertaken many initiatives concerning climate change primarily through the Inter-Agency Committee on Climate Change established in 1991. The Philippines recently completed its Initial National Communication and submitted the same to the Conference of the Parties pursuant to the UNFCCC.

In these initiatives, various institutions and entities have coordinated with or assisted the IACCC or its member agencies from the Government and NGO sectors. These entities include foreign or international funding agencies and academic institutions. The Workshop on Climate Change and Development is one such initiative primarily focusing on awareness-raising and capacity-building.

Harvard University has made significant contributions in the field of climate change through summer workshops at the Harvard Institute for International Development (HIID), economic and scientific analysis of climate change mitigation, the formulation of policy advice to the US government and governments of developing countries and transition economies, and through the climate change research program at the Kennedy School of Government.

HIID's climate change workshops, the first of which was given in 1998, are designed to provide participants with an understanding of the complex issues that lie at the interface of climate change and development. Normally offered in the summer at the Harvard University campus in Cambridge, Massachusetts, this workshop held in the Philippines provided a unique opportunity for HIID to focus on and address specific issues of a developing country. In like manner, more participants from various sectors and disciplines in the Philippines who may not be able to travel to Cambridge due to budgetary, scheduling or other constraints, were afforded this rare opportunity to attend this workshop.

The Workshop on Climate Change and Development was an activity of the the Philippines Climate Change Mitigation Program (PCCMP), a joint program of the Philippines Department of Energy and the United States Agency for International Development.

## **II. OBJECTIVES**

The general objective of this workshop was to heighten the awareness and understanding of global climate change issues, especially those which directly affect the economic development and local environment of the Philippines. As a means of capacity building, the workshop also sought to contribute to the empowerment of the participants to actively engage in climate change initiatives.

The aim of the curriculum and format for this workshop was to meet the needs of a diverse community consisting of officials and representatives from government, the private sector, academe and the NGO community. In particular, the program focused on the science of climate change, international and domestic policy instruments for climate change mitigation, valuation of damage and benefits from prevention, international cooperative mechanisms, and emissions trading for domestic and international regulation of air pollution. Through this workshop, it was hoped that the participants would learn more about climate change issues and the impact of climate change on economic development, understand how to better combat the effects of climate change, and form a basis for effective climate change policy and instruments.

## **III. PREPARATIONS and ORGANIZATION**

Formal preparations for this workshop began in January of 2000, with planning meetings involving, among others, the Philippines Department of Energy, United States Agency for International Development, the Philippines Department of Environment and Natural Resources, the Institute of International Education, and Hagler Bailly Services, Inc., the prime contractor of the PCCMP.

Under its USAID-funded contract, Hagler Bailly performed the main administrative tasks and managed the many complex coordination requirements for this workshop. In cooperation with the other entities and institutions mentioned above, these tasks included coordinating with HIID in the identification of the faculty and teaching fellows, reviewing the recommended program curriculum and format as designed by HIID, determining the participant list, and planning activities related to, but not part of, the workshop. Under a sub-contract with Hagler Bailly, the National Engineering Center of the University of the Philippines coordinated and monitored Workshop proceedings, provided general support, and produced the daily "Planet Fever", the official newsletter for the Workshop.

Originally, it was intended that a five-day workshop would be held at one of the premier hotels at the heart of Metro Manila. In consideration of logistical details, such as those relating to participants' scheduling difficulties and traffic, the format was later revised to a four-day live-in workshop at a training center outside Metro Manila. Both format and venue were very conducive to focused lectures and discussions, and facilitated greater interaction among the participants, the faculty, and the organizers.

No major problems or setbacks were encountered in either the Workshop or related activities.

#### **IV. VENUE**

Manuel M. Lopez Development Center was selected as the site for the workshop. Located in the mountainous city of Antipolo in the eastern part of Metro Manila, it provided an ideal venue for the various lectures and discussions held. The facilities provided were more than adequate and very modern. These included computer and Internet facilities, as well as overhead projectors. The size, lighting and temperature of the session room were also satisfactory. The only difficulty encountered during the Workshop sessions involved occasionally uncooperative microphones. It was also noted that additional printers and a photocopying machine would have facilitated more expeditious reproduction of documents.

Accommodations, i.e. meals and lodging, were also highly satisfactory. The residence hall where everyone was housed was quiet, and rooms therein were conducive for study and reading. In general, neither the HIID faculty nor participants encountered any major difficulties.

#### **V. FACULTY PROFILE**

##### **MICHAEL B. McELROY, Ph.D.**

*Professor, Department Of Earth & Planetary Sciences  
Harvard University*

Michael McElroy was recently named the first Gilbert Butler Professor of Environmental Studies at Harvard University. McElroy, an expert on the Earth's atmospheric chemistry, is also currently the Abbott Lawrence Rotch Professor of Atmospheric Science and has been a professor at Harvard since 1970. A renowned specialist on climate change issues, McElroy is also the chair of the University Committee on Environment (UCE) and heads the Interfaculty Initiative on the Environment. He is best known for his analyses of anthropogenic changes in the atmosphere, with an emphasis of how these changes affect climate, degrade air quality, and alter the amount of solar radiation reaching the Earth. McElroy is also currently an advisor to Vice President Al Gore on climate change issues through his work as Chair of Group Medea. He is credited with identifying the mechanism that is responsible for loss of ozone over Antarctica. McElroy is an active member of the China Council for International Cooperation in Environment and Development

##### **ROBERT STAVINS, Ph.D.**

*Faculty Chair, Environment and Natural Resources Program  
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Robert Stavins is the Albert Pratt Professor of Business and Government at the John F. Kennedy School of Government, Harvard University. He is a University Fellow of Resources for the Future, Chair of the Environmental Economics Advisory Committee of the U.S. Environmental Protection Agency's (EPA) science advisory board, and Member of EPA's Clean Air Act Advisory Committee,

the Intergovernmental Panel on Climate Change (IPCC), and the Harvard University Committee on Environment. He is also a contributing editor of *Environment*, and a frequent speaker for the Foundation for American Communications. He was formerly a member of the Board of Directors of the Association of Environmental and Resource Economists. Dr. Stavins' research has focused on diverse areas of environmental economics and policy, including examinations of policy-instrument choice under uncertainty, competitiveness effects of regulations, design and implementation of market-based policy instruments, diffusion of pollution-control technologies, and depletion of forested wetlands. His current research includes analyses of technology innovation, environmental benefit valuation, political economy of policy instrument choice, and econometric estimation of carbon sequestration costs.

### **ALEXANDER GOLUB, Ph.D.**

*Research Fellow, Harvard University  
John F. Kennedy School of Government*

Alexander Golub is currently a Project Director for the Harvard Institute of International Development (HIID) overseeing the USAID-funded EPIQ project in Central Asia and is one of HIID's leading experts on climate change issues. He has conducted workshops on climate change economics and policy issues in Russia, Uzbekistan, and Kazakhstan. Dr. Golub was leader of a World Bank study on greenhouse gas emission management in 1997-98 and is an accredited IPCC expert. Dr. Golub has approximately 20 years of experience in the field of environmental economics, natural resources management, and global climate change mitigation policy. He has been the lead expert in several international policy and advisory projects. Dr. Golub has successfully completed assignments for the GEF, the OECD, the World Bank, EDF, US EPA, Bureau of Economic Analysis, TACIS, Denmark's EPA, Czech Environmental Protection Agency, the Russian Environmental Protection Committee, and several regional environmental protection committees. Dr. Golub has published over 60 scientific papers in his field to date and currently serves as an advisor to the Russian and Kazakh governments.

### **ALIX PETERSON**

*Doctoral Student in Public Policy  
Harvard University, John F. Kennedy School of Government*

Alix Peterson is a Graduate Student Fellow and Research Assistant at the Center for International Development at Harvard. She has previously served as a teaching fellow for the workshop on climate change and development at HIID and as Assistant Rapporteur to the 5<sup>th</sup> Annual United Nations Conference on Finance for Sustainable Development. She has also co-authored several papers on the subject of climate change and development with world-renowned Harvard economist Jeffrey Sachs under the auspices of the USAID-funded CAER II project. Ms. Peterson is currently researching climate change mitigation in Latin America and India and has taught classes at Harvard in Jeffrey Sachs' course on History and Theory of Economic Development.

## *Teaching Fellows*

### **FLORDELIZA M. ANDRES**

*Assistant Secretary for Policy and Programs  
Philippine Department of Energy*

Ms. Flordeliza M. Andres is the Assistant Secretary for Policy and Programs of the Philippine Department of Energy. Her responsibilities include the regular updating of the Philippine Energy Plan and the coordination of the Philippine Gas Project implementation. She has led and participated in Philippine delegations to the APEC Energy Working Group and Ministerial Meetings, ASEAN Senior Officials and Ministerial Meetings and various UN-ESCAP sessions. Her professional experiences include a secondment to the ASEAN-EC Energy Management Training and Research Centre in Indonesia and a brief engagement at the World Bank working on energy sector privatization and regulatory issues in developing countries. She is a candidate for M.Phil./Ph.D. in Energy Policy from the Imperial College Centre for Environmental Technology in the United Kingdom. Her dissertation is on natural gas regulatory issues in developing countries. A recipient of a British Chevening Scholarship, she holds a degree of Bachelor of Science in Chemistry from the University of the Philippines and completed substantial MBA units at the Ateneo de Manila Graduate School of Business. She has also attended specialized training courses in energy and environment in various international institutions including the HIID Executive Program on Climate Change and Development.

### **ATTY. MA. CECILIA G. DALUPAN**

*Lawyer / Consultant  
Environment, Energy and Natural Resources*

Ma. Cecilia G. Dalupan was formerly with the Legal Service of the Philippine Department of Environment and Natural Resources, having served in part as OIC-Undersecretary for Legal and Legislative Affairs and OIC-Assistant Secretary for Legislative and Local Government Unit Affairs. She attended the first Executive Program on Climate Change and Development given in 1998 by HIID and the JFK School of Government, and is currently completing a program on International Environmental Law administered by the United Nations Institute for Training and Research. She was also a member of the Secretariat of the Inter-Agency Committee on Climate Change and participated in various international climate change meetings and negotiations. A graduate of the University of the Philippines College of Law, she moved to government service after two years as an associate at a prominent law firm and was a faculty member of the Legal Management Program at the Ateneo de Manila University. She is now involved in private practice and serves as a legal and policy consultant primarily in the areas of environment, energy and mining. Her current work includes a UNDP project on Capacity Building to Remove Barriers to Renewable Energy in the Philippines and an Assessment of Benefits of the Philippines Climate Change Action Plan for the National Renewable Energy Laboratory.

## VI. PARTICIPANT PROFILE

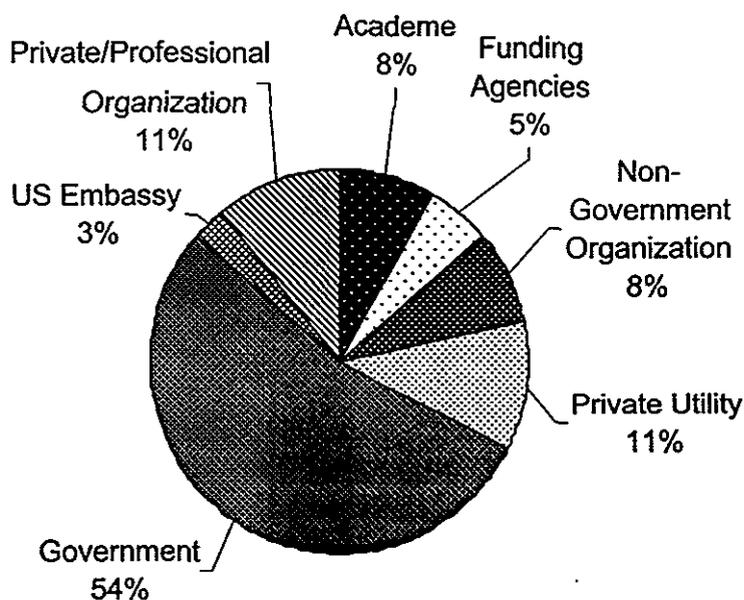
The participants of this Workshop consisted of thirty-eight leaders representing different government institutions, non-government organizations, private utilities, academia, private professional organizations, and U.S. agencies (USAID and Embassy). The following is a breakdown of participation by Agency:

<b>Government</b>	<b>No. of Representatives</b>
Department of Energy	3
Department of Environment and Natural Resources	1
Department of Foreign Affairs	1
Department of Health	1
Department of Public Works and Highways	2
Department of Science and Technology	2
Department of Trade and Industry	1
Department of Transportation and Communication	1
Energy Regulatory Board	2
National Electrification Administration	1
National Power Corporation	3
Office of Congressman Heherson Alvarez	1
Technology and Livelihood Resource Center	1
 <b>Private Utility</b>	
Davao Light and Power Co., Inc.	1
Manila Electric Company (MERALCO)	2
Iligan Light and Power, Inc.	1
Cagayan Electric Power and Light Co., Inc.	1
 <b>Academe</b>	
University of the Philippines	1
Polytechnic University of the Philippines	1
University of Asia and the Pacific	1
 <b>Private/Professional Organization</b>	
Manila Observatory	1
Philippine Electric Plant Owners Association (PEPOA)	1
Philippine Climate Change Information Center	1
Philippine Pollution Prevention Roundtable	1
 <b>United States</b>	
United States Agency for International Development (USAID)	2
Embassy	1
 <b>Non-Government Organization</b>	
Climate Change Information Center	1
Institute of Climate, Energy & Environment	1
Philippine Network on Climate Change	1
Foundation for Philippine Environment	1
<b>Total Number of Participants</b>	<b>39</b>

Of the twenty representatives from the Government, nineteen were from the Executive branch. Six of these representatives from the Executive branch were from the Department of Energy and its attached agencies. The one remaining Government representative was from the Legislative branch, specifically the House of Representatives.

As can be seen in the graphic representation below, more than half of the participants or 54% were from the government sector. For purposes of determining sectoral representation in this Workshop, representatives from the US Embassy and the US Agency for International Development (funding agency) were combined as one sector. Consequently, representation by sectors other than the Government appears evenly divided, with each sector having about 8-11% of representation.

### By Sector



A more detailed list of participants can be found in the Directory for the Workshop, attached at the end of this report as Annex "A". Feedback and comments on the high quality and degree of involvement of the participants are incorporated in the final section of this report.

## **VII. WORKSHOP PROGRAM AND PROCEEDINGS**

In general, the lectures and presentations were highly appreciated and stimulated a considerable amount of discussion among the participants. They were articulate and assertive. Clearly displaying a great deal of interest in the different topics, several discussions were quite animated. Aside from the various lectures, some of the highlights were the Mini-Workshops and the Emissions Trading Simulation Exercise wherein all participants had the opportunity for greater interaction.

The participants also had the opportunity for more in-depth consultations with the HIID faculty, particularly with Professor Stavins and Professor McElroy, who held informal parallel small-group sessions on the second and third days of the Workshop.

The workshop sessions proceeded according to the format provided hereunder.

### **Workshop Format**

#### **DAY 1 - 27 MARCH 2000**

1. Orientation and Opening Program
2. Introduction: Workshop Overview and Objectives and Brief Presentation on Philippine Climate Change Initiatives – Dr. Alexander Golub / Atty. Ma. Cecilia Dalupan
3. The Science of Climate Change – Prof. M. McElroy
4. Message by DOE Undersecretary Cyrill del Callar
5. The Impacts of Climate Change/Evaluating Climate Change Effects – Prof. McElroy
6. Economics of Global Climate Policy – Prof. R. Stavins
7. Introduction of participants – Asst. Sec. Andres and Atty. Dalupan
8. Next steps – Dr. Golub & Ms. Peterson
9. Q & A - facilitated by Dr. Golub and Ms. Peterson

#### **DAY 2 – 28 March 2000**

1. Recap of previous day's activities and lectures – Atty. Dalupan
2. Economics of Global Climate Change - Prof. Robert Stavins
3. Economics of Technological Change for Global Climate Policy – Prof. Stavins
4. Potential Impacts of Climate Change in the Philippines – Atty. Dalupan
5. Philippine Greenhouse Gas Inventory and Potential for Reduction – Asst. Sec. Andres
6. Discussion/Wrap-up – Dr. Golub

#### **DAY 3 – 29 March 2000**

1. Recap of previous day's activities and presentations – Asst. Sec. Andres
2. Benefits from GHG Mitigation - Energy savings, Productivity of Agriculture, & Human Health Protection – Prof. McElroy

3. Mini-Workshops / Break-Out Groups – Facilitated by Dr. Golub, Ms. Peterson, Asst. Sec. Andres and Atty. Dalupan
4. Emissions Trading Simulation Exercise - Facilitated by Dr. Golub, Ms. Peterson, Asst. Sec. Andres and Atty. Dalupan
5. Presentation of Group Reports – by Group leaders/representatives

#### DAY 4 – 30 March 2000

1. Recap of previous day's activities and lecture – Atty. Dalupan
2. Environmental Valuation: Local Pollution Reduction, Human Health Risk Analysis, and Health Benefits - Ms. Peterson
3. Framework Convention on Climate Change: Technology Transfer - Dr. Golub
4. CDM, Joint Implementation & Emission Trading: How a Non-Annex 1 Country Can Participate in the Kyoto Flexible Mechanisms - Dr. Golub
5. Comments/ Reactions from participants
6. Presentation of Next Steps (Mini-Workshop Results) - Ms. Lynn Castro, Participant
7. Closing Ceremonies

The teaching fellows summarized each day's proceedings for presentation to the participants on the following day. Provided in Annex "B" hereof are these detailed summaries which give both a comprehensive and deeper view of the workshop proceedings.

### **VIII. FINAL REMARKS**

The HIID team was very impressed with the quality and level of involvement of the participants. According to Dr. Golub, he met highly qualified specialists among the group and is optimistic about the ability of the Philippines to participate in elaborate and international cooperation to fight climate change. Professor McElroy expressed how impressed he was with the diversity of the backgrounds represented by the participants of the workshop and by the skill and ingenuity they brought to the discussions. He hopes that the efforts of the workshop will contribute to the formulation of a comprehensive global strategy to mitigate the serious anticipated consequences of climate change.

The participants were equally appreciative of the HIID faculty and of the Workshop in general. One expressed that it was a fruitful exercise which should be shared with others to achieve the purpose for which it was basically designed. Another expressed that the most important achievement of the Workshop is the increased level of awareness of climate change issues, and that considering that we may see some adverse and irreversible impacts, there is a need to act.

As Undersecretary Cyrill del Callar of the Philippine Department of Energy stated, it is hoped that the Workshop provided the venue for an open and frank discussion of issues and options for the Philippines in addressing its environmental concerns and aspirations, perhaps, inevitably, in the context of the international climate change debate. He also expressed his hope that the select group of participants at this workshop will serve as a network of specialists and champions for sustaining the momentum of discussion as well as for coordinating various climate change-related initiatives.

For a subsequent workshop, there are a few things that the Harvard team would want to change before implementing. In terms of substance (assuming a similar audience), we would place a heavier emphasis on the science of climate change and have the lecturer stick to those topics. We would also change the sequencing of the workshop to: 1) natural science foundations (limited to discussion of natural science, not policy); 2) discussion of the economic perspective in general; 3) discussion of the application of economics to global climate change (the costs of addressing it, the damage done if not addressed); 4) consideration of different policy instruments; and, 5) other topics. For the Manila climate change workshop, the order of topics was dictated by the availability of the lecturers and the fact that five days were condensed into four. However, the overall order did not differ drastically from what it recommended here. In the future, it is recommended that all lecturers be present for the entire workshop as is possible. Lastly, it is recommended that faculty be briefed more comprehensively beforehand on the needs and expectations of both the sponsor and participants.

ANNEX "A"

**DIRECTORY OF PARTICIPANTS**

# Participants



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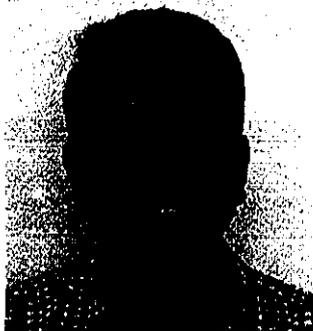
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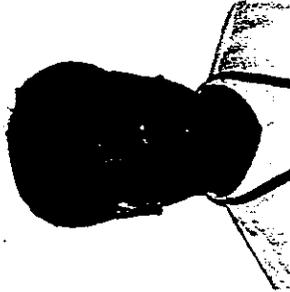
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## ANNEX "B"

### SUMMARY OF DAILY WORKSHOP SESSIONS

#### DAY 1 - 27 MARCH 2000

1. **Orientation** - Participants checked in at 8:00 AM and had breakfast at the Pavilion. Mr. Edmundo Silverio of the Manuel M. Lopez Development Center gave an orientation on the facilities.
2. **Opening Program**
  - a. Ms. Laura Mateo of the Philippine Climate Change Mitigation Program hosted the opening program and led the singing of the national anthem. Mr. Tito Fortes of Technological and Livelihood Research Center gave the invocation.
  - b. Mr. Kat Tatlonghari of USAID welcomed the participants. He stressed that the overarching strategic objective of climate change initiatives is to bring nations closer together around basic principles of equity, transparency and common but differentiated responsibilities. He gave an overview of USAID initiatives such as the climate change action plan for FY 1998 to 2002. The significant component of the action plan is building institutional and human capacity to undertake meaningful participation in international efforts to reduce GHG emissions through policy advances and capacity building efforts.
3. **Workshop Overview and Objectives – Dr. Alexander Golub / Atty. Ma. Cecilia Dalupan**

Dr. Golub started the session by discussing an overview and the objectives of the 4-day workshop. Atty. Dalupan then presented an overview of climate change initiatives undertaken by the Philippine government.
4. **The Science of Climate Change – Prof. M. McElroy**
  - a. Prof. McElroy talked on the science of climate change where he discussed the global climate change situation and the increasing CO<sub>2</sub> concentration, specifically the following:
    - (1) the greenhouse effect – what is it that determines average temperature of the earth
    - (2) how does one predict what might happen as greenhouse gas emissions continue
    - (3) different greenhouse gases: carbon dioxide, methane and nitrous oxide (N<sub>2</sub>O) and the sources of these emissions
  - b. Discussion: Among others, the following points were raised:
    - (1) There is a need to have a sense of the natural variability of the earth's climate
    - (2) Humans are the only species who can think and who can realize the consequences of their actions and do something about them.
    - (3) Humans are moving too fast. We need to allocate responsibilities properly– equity is primary issue.
    - (4) All countries have a responsibility with respect to global climate change.
    - (5) Dealing with issues associated with methane and nitrous oxide are more complicated than dealing with CO<sub>2</sub>.
    - (6) Photosynthesis is a natural resolution to climate change concerns, so focus should be on reforestation, on using a permanent portion of land for trees.
    - (7) Note that people use a significant part of land for agriculture and other important uses, that there may not be as much freedom in withdrawing that land from agriculture use given food production needs.
    - (8) Deforestation always seems focused on the tropics.
    - (9) In a number of developed countries (like the US/UK), little or no deforestation but rather, reforestation is taking place; their experience of many, many years ago is that with the advent of the industrial revolution, their wood resources were depleted, so switched to coal or other sources of energy.
    - (10) Developing countries are most vulnerable to impacts of climate change and the least capable of adapting. Is the US conscious of the consequences of climate change for other countries?
    - (11) There is a range of attitudes in the US with respect to climate change.
    - (12) The US must show, by domestic action, that they are serious about climate change, and not just 'buy' their way to compliance.

- (13) The challenge is to find ways to produce more wealth with less carbon.
- (14) There are various technological options but there is a need to provide incentives for innovation.
- (15) How can the Philippines afford mitigation when it can't even adapt to climate change consequences?  
As a response, it was suggested that the Philippines can continue its leadership role in international climate change negotiations to find creative options for developing country participation in the climate change regime.
- (16) Desire is to focus on what we can do, not on what we can't.

5. **Message by DOE Undersecretary Cyrill del Callar** – USEC del Callar emphasized that the Government of the Philippines (GOP) has done so much already to address climate change issues. These include the publication of the Philippine's Initial National Communication on Climate Change and embarking on three major programs with USAID, namely: Clean fuel, Energy efficiency, and Policy Development.

6. **The Impacts of Climate Change/Evaluating Climate Change Effects – Prof. McElroy**

- a. Prof. McElroy talked on how climate system works, what happens to particular regions of the world due to the effects of climate change, and presented predictive models that would describe the climate system but stressed that it is an enormous task.
- b. Questions / Points raised:
  - (1) What about vulnerability studies – how can we get funding for these?
  - (2) Note US Secretary of State's significant statement where he said that international environmental issues are of importance to US foreign policy.
  - (3) Note recent CIA head's recent statement that international environmental issues are matters of US national security interest.
  - (4) Prof. McElroy's opinion is that the Kyoto protocol should be amended to allow for a longer time line to enable countries to make better economic decisions, consider historical and present emissions; developing countries to determine what their emissions profile is and let that be their commitment

7. **Economics of Global Climate Policy – Prof. R. Stavins**

- a. Prof. R. Stavins cited that environmental economics is not only limited to climate change but to different environmental issues. Economics also deals with human welfare.
- b. Two assertions were made:
  - (1) Causes of environmental problems are economic in nature. For example, an electric utility firm emitting pollution is hampered by constraints to cut back on pollution levels, which entails costs. Such constraints include the competitive market environment and fiduciary responsibility of maximizing returns to shareholders.
  - (2) Consequences of environmental problems have important economic dimensions. Externalities of environmental pollution are:
    - producer to another producer (pollution emitted by electric utilities to another company like laundry service)
    - producer to consumer (effect of pollution to a child's growth)
    - consumer to another consumer (smokers' effect to non-smokers)
    - consumer to producer (spilling popcorn in the movie theater would increase cost and increase prices)
- c. Economic value of environmental quality is whatever a person (society) would sacrifice for it. Environmental pollution that affects human health has economic costs, which include opportunity costs (decreased productivity, decreased happiness/quality of life, etc).
- d. A person or society's willingness-to-accept (WTA) or willingness-to-pay (WPA) is the economic value of environmental quality:
  - (1) Willingness to accept (WTA) – How much compensation are you willing to accept for the damages?
  - (2) Willingness to pay (WTP)- How much would you pay to avoid it happening?
- e. Economic benefits of environmental policy are equal to the damages that are avoided. Look at the damages if the policy is not in place.

- f. Criteria for choosing pollution control levels
  - (1) Efficient level of pollution control - where marginal benefits equal marginal costs
  - (2) Equity - Who gets the benefits and who pays the cost

**8. Introduction of participants – Asst. Sec. Andres and Atty. Dalupan**  
Brief sharing of background and expectations by participants

**9. Next steps – Dr. Golub & Ms. Peterson**

A description of the mechanics for the mini-workshop to be held on Day 3 and 4 was presented. Participants will break out into three discussion groups electing a rapporteur and a presenter.

**10. Q & A - facilitated by Dr. Golub and Ms. Peterson**

The most discussed point concerned the implementing rules and regulations of the Philippine Clean Air Act of 1999, with various participants sharing their views and proposals.

**DAY 2 – 28 March 2000**

**1. Recap of previous day's activities and lectures – Atty. Dalupan**

**2. Economics of Global Climate Change - Dr. Robert Stavins**

- a. Lecture Objective: To provide analytical tools to analyze climate change issues – basic economics
- b. Environmental problems:
  - (1) these are fundamentally caused by economic externalities –economic decisions that have negative impacts on the others (individuals, other firms and the like)
  - (2) their consequences have important economic dimensions
- c. Criteria for choosing the optimum level of environmental protection
  - (1) Economic efficiency
    - maximizing net benefits
    - issue is who gets the benefits/who pays for the costs, i.e., *distributional equity*
    - benefits from investments in environmental protection are avoided damages, however they may be difficult to measure
  - (2) Cost-effectiveness
    - minimizing total cost
    - easier to analyze and less controversial
    - danger is cost-effective way may not always be the efficient way, i.e., may be like “designing fast trains to the wrong stations”
    - policy is cost-effective if it is the cheapest means of achieving target after considering alternatives, i.e., if policy instruments equate marginal cost of abatement across polluters
- d. Policy Instruments
  - (1) Command-and-Control
  - (2) Technology standards
    - all must use the same kind of technology e.g., the use of scrubbers as a technological approach to the problem of acid rain
    - not cost-effective
    - not dynamically cost-effective (does not provide incentives to invest in new technology)
    - low monitoring/enforcement costs
  - (3) Performance standards
    - an improvement over technology standard because one has a choice on the use of the best technology available
    - may be of two types:
      - uniform standards: not cost-effective; “sort of” dynamically cost-effective (provide incentive for innovation)
      - non-uniform standards: in theory, a better policy but poses information problems, i.e., government has to have information on all the firms’ marginal abatement costs.
    - Specific problems with non-uniform standard:

- firms may not divulge the real situation
  - firms may not know if they are low cost or high cost controllers
  - may be politically infeasible to implement
- (4) Market-Based Instruments
- Emission Tax
    - for every unit of pollution emitted, tax is paid
    - cost-effective
    - dynamically cost-effective because it provides an incentive to look for the best use of technology to effect savings in the long run. This means lower cost to private industry. The idea is for each source to strike a balance between the tax and the marginal cost.
    - depends on enforcement and efficiency of tax collection
    - to know the tax level to set, government doesn't require much information; doesn't need to know marginal cost of pollution control for all firms but only the total/overall MC function or the supply function
    - pollution tax is transparent, easy for consumers to calculate the cost of environmental protection, thus, from the economists' perspective, it enables individuals to make better decisions
    - for environmental advocates, transparency could be a problem because they want to have as much pollution control as possible
    - bad news with Emission Tax
      - (i) still has information problem (although at a smaller scale)
      - (ii) regulated sector would not like it – maybe more expensive than command-and-control
      - (iii) tax transparency
      - (iv) the T (tax) word – people don't like taxes
  - Tradable Permits
    - firms can trade permits to emit pollution and undertake abatement in areas where it is cheaper to do it
    - equity issue: it makes a difference how the permits are allocated
    - emission targets are set by government, market/firms determine the cost of doing it

### 3. Economics of Technological Change for Global Climate Policy – Prof. Stavins

- a. Different policy instruments are anticipated to have different effects on technological change
  - (1) Market-Based Instruments
  - (2) Command-and-Control
- b. Process of Technological Change
  - (1) Invention
  - (2) Innovation
  - (3) Diffusion
  - (4) Utilization
- c. Factors affecting diffusion
  - (1) Change in price – for a 10% change in price, adoption is less than 10%
  - (2) Adoption cost subsidies more effective than taxes
  - (3) Regulations had no discernible effect
- d. Kyoto Protocol
  - (1) Emission reduction targets
    - To appreciate emission reduction targets, one has to know about country's energy circumstances, e.g., Australia is a coal exporter
    - In the case of Russia, economy collapsed prior to 1990, hence, emission was way below targets
  - (2) Joint implementation
    - concept is good for financial transfers but flawed as a climate change measure
    - problem is lack of observable baseline
    - mere turnover of capital stock results in efficiency
    - "hot air" issue : countries getting more permits than what they need and selling them

#### 4. Potential Impacts of Climate Change in the Philippines – Atty. Dalupan

- a. Based on the Philippine Initial National Communication
- b. Temperature and rainfall impacts of climate change
  - (1) Average increase of 2 to 3<sup>0</sup>C in annual temperature
  - (2) increase in rainfall distribution in many areas
- c. Corresponding impacts:
  - (1) Water Resources – great variability in rainfall with respect to time will have significant implications on water availability. The water requirement of the agricultural sector will be impacted due to increased crop activity. With respect to domestic water consumption, the expected increase in temperature will surely have an effect although a quantitative analysis has yet to be identified
  - (2) Coastal Resources – climate change may aggravate existing coastal problems and lead to a range of impacts including sea level rise, changes in storminess, precipitation and freshwater availability. Accelerated sea level rise may also affect physical and biological systems along the coastal areas, as well as port and coastal infrastructure as well as traditional lifestyles and culture in the coastal zones.
  - (3) Forestry - Climate change may increase the rate of conversion of forests to agricultural lands due to human migration from areas degraded by drought and erosion to more productive forestlands. It may accelerate forest loss, increase runoff resulting in soil erosion and floods. Local biodiversity may also decrease. It may have severe impacts on mangroves.
  - (4) Health – Although further studies need to be done, rough projections show that there is an association between climate change and the incidence of diseases such as those with are droplet-spread (ex. Bronchitis, pneumonia etc)
- d. Comments and suggestions:
  - (1) List down strategies to be undertaken by the country for both climate mitigation and adaptation activities. Presently, there are no comprehensive studies on the impact of climate change for the Philippines, as well as the budgetary requirements to address this problem. At the moment though, there is no national budget allocation for climate mitigation and adaptation activities.
  - (2) There should be concrete plans on how to inform the people about the *climate change* problem. Although local action planning consultations were done but these were limited in nature. Only a few provinces were included due to budgetary deficiencies.
  - (3) There is a need for inter-departmental efforts to address these climate problems. More serious studies should be conducted quantifying the effects and impacts of climate change in the country e.g. intensity of soil erosion, siltation and other problems.
  - (4) The absence of accurate information for other provinces (e.g. inability to quantify accurately the rise in the sea level in the province of Jolo) is due to the absence of sufficient data on these areas.

#### 5. Philippine Greenhouse Gas Inventory and Potential for Reduction – Asst. Sec. Andres

- a. 1994 GHG inventory (by the Manila Observatory)
  - (1) Energy sector is the biggest contributor to CO<sub>2</sub> emissions (50%) followed by agriculture
  - (2) Among the energy consuming sectors, the energy industries (power generation) and transport account for the highest contributions to CO<sub>2</sub> emissions
- b. Energy Situation and Outlook
  - (1) There is a significant decline in oil dependence especially for power generation since the early seventies due to availability and efforts to harness hydropower and geothermal power
  - (2) Energy demand will almost double within the next ten years based on economic growth targets
  - (3) Oil dependence will further decline due to availability of natural gas and increased hydropower use
  - (4) Biomass utilization will remain significant, and its large-scale for rural electrification use is being promoted particularly
- c. GHG Forecasts - emissions by the energy sector will almost double within the next ten years corresponding to the projected increase in energy consumption
- d. Energy Policies and Programs
  - (1) Policies and programs remain anchored mainly on self-sufficiency/energy security objective but there is also an increasing emphasis on clean fuels/technology and energy efficiency
  - (2) Energy industry restructuring will be more aggressively pursued to promote overall energy sector efficiency

- (3) Equity considerations may lead to some subsidies, e.g., for expansion of rural electrification and to lower electricity cost to marginalized sectors
- e. Comments and Suggestions
  - (1) Energy sector appears to be doing enough to reduce dependence on dirty fuels and promote energy efficiency but what about the transport sector? Options for fuel substitution not yet feasible but other things could be done, e.g., road and traffic maintenance, mass transport.
  - (2) Impact of energy policies and programs resulting mainly in avoidance of GHG emissions but there are also some that will result in reduction, e.g., retirement of oil-based thermal power plants.

**6. Discussion/Wrap-up – Dr. Golub**

- a. Dr. Golub asked the participants to identify the most pressing impacts of climate change and major areas for greenhouse gas reduction.
- b. Four most pressing impacts of climate change:
  - (1) Increased probability of flooding due to rise in water level
  - (2) Accelerated sea level rise
  - (3) Decrease in food production
  - (4) Health problems
- c. Five Major Areas for Greenhouse Gas Reduction
  - (1) Energy industry restructuring
  - (2) Switch to cleaner fuels e.g. natural gas
  - (3) Further development of hydroelectric energy
  - (4) Greater use of geothermal energy
  - (5) Energy efficiency such as heat rate improvement in power plants and other measures

**DAY 3 – 29 March 2000**

**1. Recap of previous day's activities and presentations – Asst. Sec. Andres**

- a. ASEC Andres gave a review of important points discussed during the previous day.
- b. Atty. Dalupan also made a clarification regarding the table presented previously on the potential projected accelerated sea level rise (ASLR), i.e. that there is no certainty as to if and when the country might be affected by this. Previous studies have identified only those areas which would be threatened in the event of ASLR. In this regard, it was noted that geological factors are relevant in determining whether there is really sea level rise or subsidence. Consequently, care should be taken when making projections and further studies are needed.
- c. Participants noted that there are areas where ASLR is already being experienced and that these should be documented. This would be necessary for emergency-preparedness programs and would allow us to prepare mechanisms for adaptation. Others noted that there have been many initiatives aimed at raising public awareness but more areas still need to be reached especially since all sectors stand to be affected. It was suggested that an action plan should be made by all sectors including the government and private sector.

**2. Benefits from GHG Mitigation - Energy savings, Productivity of Agriculture, & Human Health Protection – Prof. McElroy**

- a. Prof. McElroy began by pointing out the difficulty in assessing sea level rise, but that the global rate of sea level rise is about 10 cm. He then proceeded with a review of the experience of developed countries during the industrial revolution, and the 'environmental mistakes' they made in the process. Thus, developing countries have the opportunity to learn from these mistakes in their own paths toward development.
- b. By way of examples, he pointed out the experiences of the US with coal burning in the 1940's, acid rain and 'bad' ozone in more recent years. Negative environmental impacts of industrial activities were accepted as part of the 'price of progress' until a wake-up call occurred in the form of health problems and even fatalities. Government was then pressed to take corresponding measures by citizens themselves, particularly at the local levels. One of the challenges in addressing environmental problems is technological. When the sources of the problems have been identified, technological changes may be introduced to respond to these sources.

- c. Developing countries may have the opportunity to do better by not committing the same mistakes as the those made by western countries. The challenge is to analyze what can be done differently, so that the price of progress is not air quality, health or other environmental concerns.
- d. Environmental problems are not all local, however, but can have transboundary effects. Pollution emitted in one area is not contained therein but can affect other areas and even countries. Consequently, these are not only domestic issues but international issues calling for international responses.
- e. Climate change issues affect the world as a whole. The attitude that one is only responsible for the problem in one's own country will not help. With respect to CO2 reduction, there are a number of ways of going about this. Conservation and more efficient use of energy is the first thing to do. Next step is to switch from coal or oil to natural gas. Natural gas is the cleanest in emission. He noted that the Philippines is the second largest producer of geothermal energy.
- f. In response to some questions raised, Prof. McElroy stated that assuming CO2 emission is completely eliminated by the USA, the problem will be repeated by China and other developing countries. So, there is a need to involve the other countries, especially the developing ones. Rich countries should limit their use of energy. A comment was then made that the Philippines' energy plan shows that we are aware of the issue but that we need to see equitable distribution of responsibilities. We can discuss options but we can't draft Philippine decisions. We can only identify ways to avoid emissions. We want transfer of technology to address the issue.
- g. It was also pointed out that the Philippines is aware of the issues but we don't have the resources for mitigation plans. There should be good coordination because we have so many think tanks. We should have a practical approach and better relationships among the entities concerned. Concern was raised over how developing countries can level the playing field in terms of addressing the climate problem.
- h. Finally, it was suggested that instead of debating the effectiveness of the Kyoto protocol, we should ask what other countries are doing and what we can do. Prof. McElroy pointed out that creative measures can be sought as in the case of BP Amaco which has imposed the Kyoto standard on its internal operations.

### 3. Mini-Workshops / Break-Out Groups

- a. After receiving general instructions from Dr. Golub, the participants were divided into 3 groups to discuss 'next steps' on the following:
  - (1) Adaptation
  - (2) Role of the Phil in the international arena
  - (3) GHG avoidance/reduction
- b. Each of these groups selected their 'leader' and recorder while the HIID faculty, teaching fellows and workshop staff joined them as observers.

### 4. Emissions Trading Simulation Exercise

- a. The participants were divided into teams after which Ms. Peterson gave a briefing on the objectives and mechanics of this exercise. The teams represented companies which were tasked to design their operating strategies in the light of emissions trading regulations which required their industry to reduce SO2 emissions by 40%. With 2 free permits representing 200 tons each of SO2 emission allowances, they then had to decide how they would 'play' in the market with the goal of making as much profit for their company. After studying their options, a government auction was held, followed by an auction of permits which some of the companies wanted to sell.
- b. The big winner in the emission trading simulation game was the Faraday firm with 17 M in profit. Some firms shut down, some had modest profits, while others suffered huge losses. Ms. Alix Peterson then discussed the results with the whole group. She pointed out that the trading system allows companies to take advantage of their differences in abatement costs, whereas under a command-and-control scenario, all companies are made to comply with the same standard regardless of their appropriateness to their specific circumstances. She also pointed out the following important issues with respect to emissions trading:
  - (1) Transactions Costs
  - (2) Learning
  - (3) Market Power
  - (4) Information Requirements
- c. The following were among the reactions and comments of the participants to the Emissions Trading Simulation Exercise:

- (1) We gain benefit from the experience because we in the energy sector can prepare for the future and we will know how to handle firms.
- (2) It gave an idea of how the firms decide and what their requirements and considerations are.
- (3) Emission monitoring is costly.
- (4) The standard is set by Congress or some other entity, and may not always be the 'right' one.
- (5) For an international trading situation under the FCCC, trading would be through governments

## 5. Presentation of Group Reports

- a. The leaders of the 3 different groups which participated in the Mini-workshop in the morning then presented the output of their sessions. The major areas of discussion were adaptation, the role of the Philippines in the international arena, and GHG avoidance/mitigation.

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### (1) Group 1's Output

#### *Adaptation*

1. Executive Order on Climate Change
  - IEC
  - Build baseline information for monitoring geogenic and anthropogenic CC effects
  - Conduct vulnerability assessments to determine appropriate adaptation measures esp. for most critical sites/sectors
  - Study factors complicating CC effects assessment such as subsidence due to groundwater extraction and rising sea level.
  - so that CC concerns are integrated into the national development plans and programs
2. Climate Change Act

#### *Philippines' Role in the International Arena*

1. To continue participation in the development of mechanisms and institutions for the eventual entry into force of the Kyoto Protocol taking into consideration equity, transparency, efficiency, ...
2. Minimize GHG emissions
3. Lead by example: thru legislation, IEC, etc.
4. Aim for SD: for equitable distribution of resources and opportunities.

#### *Emissions Reduction/Avoidance*

1. Prioritize CC concerns re the Transport sector
  - development and use of an efficient mass transport system
  - compressed natural gas
  - Political will – phaseout of jeepneys and tricycles
  - Philippine Clean Air Act implementation
2. Regulation/incentives to encourage devt. and use of RE sources
3. Research on low methane-emitting rice varieties; address agri contribution
4. IEC to increase public awareness
5. Review Power Development Plan to minimize CO2 emissions.
6. Quantify costs of CC actions vs. "business as usual" scenario for possible funding.

### (2) Group 2's Output

#### *Adaptation*

1. Enhance IEC activities
2. IACC to spearhead activities using the Pangasinan experience as model
3. Get resources/necessary funding
4. Tap concerned agencies (national government, NGOs, LGUs, etc) to ensure 100% (nationwide) coverage
5. Identify projects that could be implemented through the leagues (League of Municipalities, League of Cities, etc.) and the timetable for project implementation
6. Determine funding sources and mechanisms
7. Set-up monitoring body/group that will evaluate projects

*Philippines' Role in the International Arena*

1. Strongly advocate the immediate ratification of the Kyoto Protocol; it could be insisted that the Kyoto Protocol be ratified soon even if there is no definition yet of the nature of participation of the developing countries considering that it is the developed countries which contribute the most in GHG emissions.
2. Long-term involvement of the Philippines in international climate change for a
3. International advocacy role on the adverse effects of climate change
4. Examination of barriers (implications and loop holes) to using forests for carbon sequestration
5. Develop projects and programs for reducing emission using leverage from developed countries
6. Participate in international audits and inspection of effects of climate change

*Emissions Reduction/Avoidance*

1. Develop new and renewable energy (NRE), and clean and indigenous power projects
2. Energy efficiency
3. Promotion of mass transport, non-motorized and energy efficient modes of transportation

**(3) Group 3's Output**

*Adaptation to Climate Change*

Macro Level

What	Who
1. Vulnerability Assessment to climate change (site specific)	Inter-agency Committee on Climate Change (IACCC) expert scientists Local government Civil Society National Agencies Academe
2. LAP model for response to vulnerability	FPE Sectoral experts Academe
3. Information dissemination on vulnerability and response to climate change	Church Climate Change Information Center (CCIC) Non-government organizations (NGOs) Local government Media
4. Coordinating mechanism among concerned agencies	CCIC National Disaster Coordinating Council (NDCC) Phil. Council for Sustainable Development (PCSD) IACCC
5. Use El Niño phenomena as jump off point for action	Strategy for 1 & 2

Micro Level

What	Who	When	Resource
1. Information dissemination			
a. Conference for a	CCIC	monthly	donors
b. Printed materials			
-bill inserts	Utilities(VECO, MERALCO)	Monthly	IACC, GF
-primers	Foundation for Phil.	April	FPE, USAID
-handouts	Environment (FPE)	April-May	FPE, USAID
-video/slides	FPE	monthly	Nat'l Gov't
c. Advocacy seminars on energy-efficiency & safety, power patrol, & transport patrol	Department of Energy (DOE)		

6. The participants then discussed and clarified various points raised about the outputs. These would be consolidated by the group leaders together with the HIID team for presentation to all the participants the next day.

#### DAY 4 – 30 March 2000

##### **1. Recap of previous day's activities and lecture – Atty. Dalupan**

- a. Following are among the comments given by the participants on the recap:
  - (1) Examples citing specific companies involved in emission trading transactions should be deleted because it might become an advertisement for them; otherwise, other companies should also be cited.
  - (2) Lessons learned from Philippine experience with independent power producers could be applied to international emission trading where similar issues might arise: large firms with significant market power, transaction costs due to brokers and interlocking contracts to secure market and political risks, and information asymmetry -- inadequate information and the high cost of acquiring them.
  - (3) Kyoto Protocol has to be explained and the context in which emissions trading and other flexible mechanisms are discussed.

##### **2. Environmental Valuation: Local Pollution Reduction, Human Health Risk Analysis, and Health Benefits - Ms. Peterson**

- a. The objective of this presentation was to provide valuation tools that are useful not only for measuring environmental quality but also for other public services
- b. Questions to answer in analyzing environmental benefits:
  - (1) Why do you care about measuring benefits from the environment?
  - (2) Why are the benefits we derive from the environment hard to measure?
  - (3) How should we think about the range of benefits?
  - (4) What types of economic methods can we use to value the environment (stated and revealed preference)?
- c. Benefits are hard to measure because there is no market or prices for these "goods", e.g. clean air. One of the tools that can be used in measuring environmental benefits is the valuation method. It is a guide in making decisions. Valuation tools gives a sense of dollar value to avoided damages.
- d. Common Applications – we are interested in valuing changes in:
  - (1) Air and water quality, soil productivity, noise level
  - (2) Quantity of service and potable water
  - (3) Health and size of biological populations
  - (4) Risks to life or morbidity
- e. Valuation Concepts
  - (1) There are two major types of environmental valuation techniques: monetary and non-monetary or physical.
  - (2) Direct valuation techniques determine the monetary values individuals place on receiving environmental amenities or avoiding environmental costs.
  - (3) Non-monetary or physical valuation techniques sometimes called indirect valuation techniques) measure physical environmental impacts themselves, e.g., tons of pollution emitted and their health effects) without directly placing a monetary value on those impacts.
  - (4) Values that monetary techniques measure can be broken down further into two categories: use and non-use (sometimes-called passive use) values.
    - Use value: a consumer's enjoyment of an attribute of a resource by directly using it or appropriating it, e.g., all market goods, recreational services, air quality near the home
    - Non-Use Value: a consumer's indirect or unobservable enjoyment of an attribute or resource, e.g., distant or unique ecosystems
  - (5) Option Value – value placed on the existence of an environmental good or service because they may be used in the future. contingent valuation, hedonic prices
  - (6) Existence Value – value placed on an environmental good or service that is unrelated to the consumption of that good or service.
  - (7) There are three reasons given why people might care about the existence of some species or places:

- *bequest* motives (individuals wish to provide their descendants with environmental resources);
  - *gift* motives (usually to members of the current and not the future generation) and
  - *sympathy* motives (out of respect and sympathy for rights of species).
- f. Valuation Techniques
- (1) Productivity Cost Model
- Amenities that this method can value: changes in human or agricultural productivity as a result of changes in environmental quality
  - Concept: damage (dose response) functions can be estimated by scientists using epidemiology or agricultural statistics
  - information about changes in output can be multiplied by market or shadow prices to monetize the damages
  - Caveat – damage functions may be difficult to estimate, behavioral responses to changes in environment quality must be considered
  - Consider whether the change in environmental quality will result in a marginal change in output, with unchanged prices, or whether prices will be expected to change
- (2) Opportunity or Replacement Cost Model
- Amenities that this method can value: changes in air or water quality or changes in animal habitat
  - Concept: estimate the value of environmental damage based on what it would cost to remedy or replace the damaged environmental asset or service
  - Estimate the value of lost economic opportunities
- (3) Travel Cost Model
- Amenities that this method can value: recreational sites, cultural sites, health clinics, which usually have a zero or nominal admission price.
  - Concept: visitors at different distances from a site face different travel costs or prices; by observing the number of trips taken at these different prices we can estimate a “demand function” for the site; integrating under that demand function gives the average annual consumer surplus (willingness to pay) per visitor
- (4) Hedonic Pricing Approach
- Amenities that this method can value: air and drinking water quality, noise proximity to waste sites
  - Concept: Hedonic pertains to pleasure. Differences in values can be attributed to pleasure derived from the positive characteristics of goods, e.g., housing (and land) is made up of several characteristics that determine its value- beautiful view or noise and smell; the total price of a house is the sum of the implicit prices for each characteristic (bundled price); these implicit prices can be estimated statistically
  - Assumptions: consumers have good information, low transaction costs, and may choose any combination of characteristics, i.e., there is a market for houses and people are moving at will.
- (5) Contingent Valuation
- Amenities that this method can value: can be used for all amenities but is most important for valuing resources that have mostly non-use value
  - Concept: even where people do not spend money and reveal their willingness to pay for an environmental benefit, it should be possible to confront them with a hypothetical market and ask them
  - Criticisms of the contingent valuation method:
    - i. Respondents do not understand what they are being asked to value
    - ii. Respondents give answers that are inconsistent with economic theory
    - iii. Respondents do not reveal true WTP or do not take surveys seriously (warm glow effect)
    - iv. The survey design may encourage bias even if people wish to reveal their WTP (e.g. starting point bias)
- g. Benefit-Cost Analysis
- (1) Benefits: Willingness to pay rather than go without the project
  - (2) Costs: Opportunity cost-best alternative use of resources
  - (3) Procedure for analysis:

- The project(s) to be analyzed are identified
- Choose the correct counter-factual to the proposed project
- Use shadow prices when market prices are distorted by taxes or subsidies
- All impacts of the project, favorable and unfavorable, in present and future are identified
- Values are assigned to these impacts.
- For each period, the net benefit is calculated.
- The total stream of net benefits is added-future periods are discounted. Issue is the right discount rate to use.

### 3. Framework Convention on Climate Change: Technology Transfer - Dr. Golub

- a. The objective of the lecture was to explain the proposed mechanisms for international cooperation
- b. Technology Transfer: Article 4.5 (UNFCCC): "The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention."
- c. Parameters
  - (1) GDP -- higher GDP results in higher CO<sub>2</sub> emission
  - (2) GDP Structure - nature of economic activities, e.g. if country has steel production, higher CO<sub>2</sub> emission
  - (3) Energy/GDP or CO<sub>2</sub>/GDP
- d. Comment from participant: If technology transfer will sustain growth, why is it that the commitment of developed countries does not include technology transfer? Why is technology transfer not taking place? Issue on technology transfer is different from the new mechanism.
- h. Response from Dr. Golub: New mechanisms were introduced in the Kyoto Protocol with real cases of technology transfer.
- i. Response from Dr. McElroy: Language/words used in the provisions of the protocol are ambiguous

### 4. CDM, Joint Implementation & Emission Trading: How a Non-Annex 1 Country Can Participate in the Kyoto Flexible Mechanisms - Dr. Golub

- a. Clean Development Mechanism (CDM)
  - (1) Article 12 (KP): "The purpose of the clean development mechanism shall be to assist Parties not included in Annex 1 in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3."
  - (2) The Rules for CDM
    - CDM is subject to the authority and guidance of the COP and will be supervised by an executive board of the clean development mechanism
    - Emission reductions resulting from each activity shall be certified by operational entities;
    - Reductions in emissions that are additional to any that would occur in the absence of the certified project activity
- b. Joint Implementation & Emission Trading
  - (1) For the purpose of meeting its commitments under Article 3, any Party included in Annex 1 may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy.
- c. Emission Trading Concepts
  - (1) Carbon emission has different prices for different emitters; different countries have different expectations; WB estimate is US\$20/ton of CO<sub>2</sub>
  - (2) Companies which are low-cost controllers believe prices should be lower; those with no options for reduction have higher price expectations
  - (3) Emission trading works as a secondary market for carbon allowances.
- d. CDM vs. Emission Budget Trading
 

Transaction	Distribution
Reduction	Transaction

Approval  
Certification

Compliance

e. **Baseline & Additionality**

- (1) Project by Project
- (2) Business as Usual
- (3) Additional Reduction only
- (3) Incremental Costs

\* Additionality and incremental costs create difficulty in projects.

f. **Philippines on GHG Market**

- (1) Philippines is a price taker
- (2) It is important to minimize transaction costs from certification and verification process

g. **Minimum Elements to Participate in Flexible Mechanisms**

- (1) a legal obligation that specifies a limitation of total emissions of the pollutants of concern i.e., an emissions cap
- (2) measurement of emissions; reporting and tracking of emissions and transactions
- (3) fungibility: defining what is to be traded
- (4) accountability
- (5) consistency
- (6) transparency

h. **Investment Facility**

- (1) the project category
- (2) achieved greenhouse gas (GHG) offsets
- (3) costs of implementation
- (4) project additionality
- (5) compliance with national and international requirements

i. **Who is going to buy?**

Private business	-	BP Amoco
International Institutions	-	WB Carbon Fund
Governments	-	Switzerland, The Netherlands

j. **What is the Carbon Fund?**

- (1) Transferring Offsets: to OECD governments/companies
- (2) Originating Offsets: in Eastern Europe/FSU and developing countries
- (3) Benefits: risk diversification/reduction of transaction costs

**5. Comments/ Reactions from participants**

- a. If you have projects such as those in the Phil. Energy Plan which are financially viable you don't even have to go into the flexible mechanisms.
- b. Emission reduction being an emission right when transferred to another country is a radical concept.
- c. Dr. Golub: Make a cost-benefit analysis so you can decide what policy is appropriate for the Philippines
- d. **Inputs of Ms. Bernarditas Muller (DFA/IACCC): Context of the Climate Change Convention**
  - (1) The UNFCCC is a legally binding instrument on climate. Climate change is taking place and there are adverse effects. As early as 1980s, data has been given. As a first step, world climate conference has been conducted.
  - (2) There is an accumulation of GHGs in the atmosphere that resulted in concentration. It started during the industrial revolution but it is accumulating now at a faster rate. Reduction of emission will lessen the concentration.
  - (3) The objective of the UNFCCC is to stabilize GHG emissions based on the principle of shared but differentiated responsibilities, i.e., developed countries should take the lead towards the reduction and modification of long-term trends in GHG emissions.
  - (4) The main commitments taken by the developed countries are provisions of additional financial resources and facilitation of access to appropriate technology.

- (5) Developing countries should plan for sustainable development taking into consideration environment and climate change. Developing countries are most vulnerable to climate change impacts including sea level rise, the El Nino phenomenon, and typhoons.
  - (6) Article 12 of the UNFCCC involves developing countries. It involves communication by all parties of the inventory of GHG emissions and steps being taken to implement the Convention.
  - (7) The Kyoto Protocol is still being reviewed with respect to the adequacy of commitments. The 1995 review shows that implementation of commitments is inadequate.
  - (8) CDM guidelines are still being analyzed, i.e., possible use of CDM projects to be applied to the commitments of the developed countries.
  - (9) Emissions trading is not under Kyoto protocol per se. We are still in the process of talking about the issue of additionally.
  - (10) Emission reduction measurement and certification are still being discussed. Many things are still under discussion. We are not in a position to determine what mechanism we can use. Issues may not be decided upon in COP 6.
- e. Comment from Dr. Golub: We encourage the Philippines to take a more active role in the international arena. Try to push your opinions to serve your economic interest.

#### **6. Presentation of Next Steps (Mini-Workshop Results) - Ms. Lynn Castro, Participant**

- a. Ms. Castro presented the consolidated outputs/recommendations of the three working groups on the next steps which the Philippines can pursue with respect to the Climate Change issue. There were three issues/questions which the participants were asked to address:
  - (1) Adaptation: what can be done in the short-term and long-term
  - (2) What position can the Philippines take in the international negotiations
  - (3) Domestic policy for GHG reduction
- b. The recommendations on Adaptation are classified into the following categories:
  - (1) Legal
  - (2) Institutional
  - (3) Research/studies
  - (4) Information, education and campaign, and
  - (5) Funding/logistics
- c. On Question 2, the proposed steps were analyzed according to who should be participating in the action plan, government, civil society or both.
- d. On Question 3, the agencies responsible for filling policy gaps and/or implementing existing policies were identified.
- e. Discussions/Comments
  - (1) There is no need for a Climate Change Act. There is already a bill filed at the House. We already have the Philippine Clean Air Act. We should concentrate on enforcing the law.
  - (2) Instead of an EO, ask DILG to issue memorandum order for local government to consider climate change in their local planning.
  - (3) Have separate item for vulnerability assessment under adaptation.
  - (4) Try to reconstruct the data about the climate in the Philippines thousand years ago. You dig corals from the different parts of the Philippines and study.
- f. The consolidated action plan of the group was revised accordingly and a final version was distributed to the participants after dinner.

#### **7. Closing Ceremonies**

- a. The following gave the closing remarks:
  - (1) Dr. McElroy and Dr. Golub on behalf of HIID
  - (2) Asst. Sec. Liza Andres on behalf of the DOE
  - (3) Ms. Chato Calderon on behalf of the USAID
- b. On behalf of the participants, the following also gave closing remarks:
  - (1) Ms. Alice Herrera of DOST representing government;
  - (2) Mr. Dave Tauli of CEPALCO representing the private sector; and
  - (3) Fr. Jett Villarin representing the academe and non-governmental organizations.
- c. Awarding of Certificates of Completion

## Next Steps: Result of Discussions in Mini-workshop Sessions on Climate Change

### I. Adaptation

Identified steps were classified into categories depending on the nature of the action.

<b>Legal</b>	<ul style="list-style-type: none"> <li>• Memorandum Order on Climate Change</li> </ul>
<b>Institutional</b>	<ul style="list-style-type: none"> <li>• Identification of the IACCC to spearhead IEC activities</li> <li>• Tap concerned agencies (national government, NGOs, LGUs, etc.) to ensure 100% (nationwide) coverage of the IEC</li> <li>• Identification of the Leagues (of Municipalities, Cities, etc.) as implementors of projects</li> <li>• Set-up monitoring body/group that will evaluate projects (feasibility, implementation and effectivity)</li> <li>• Coordinating mechanisms among concerned agencies</li> </ul>
<b>Research/Studies</b>	<ul style="list-style-type: none"> <li>• Build baseline information for monitoring geogenic and anthropogenic climate change effects</li> <li>• Study factors complicating climate change effects assessment such as subsidence due to groundwater extraction versus rising sea level</li> <li>• Identify projects that could be implemented</li> <li>• Conduct Vulnerability Assessment to climate change (priority give to critical sites/ sectors)</li> <li>• Conduct Adaptation studies to climate change</li> <li>• Local Action Planning (LAP) model for response vulnerability</li> <li>• Use El Niño phenomena as jump off point for action</li> <li>• Gather historical meteorological data for Philippines to the extent practicable (e.g., cores of coral)</li> <li>• Strengthen monitoring function of CCIC</li> </ul>
<b>Information, Education and Communication (IEC)</b>	<ul style="list-style-type: none"> <li>• Use of the experiences in Pangasinan, the 5 cities and other provinces as models for IEC</li> <li>• Information dissemination on vulnerability and response to climate change</li> <li>• Information dissemination through conference fora and printed materials</li> <li>• Advocacy seminars on energy efficiency</li> </ul>

	and safety, power patrol and transport patrol
<b>Funding/Logistics</b>	<ul style="list-style-type: none"><li>• Get resources/necessary funding</li><li>• Determine funding sources and mechanisms</li></ul>

## II. Country's Role in the International Arena

	Government	Civil Society
Continue participation in the development of mechanisms and institutions for the eventual entry into force of the Kyoto protocol taking into consideration equity, transparency, and efficiency...		
Lead by example: thru legislation, IEC, and minimization of GHG emissions		
Aim for sustainable development: for equitable distribution of resources and opportunities		
Strongly advocate the immediate ratification of the Kyoto Protocol by all Annex I countries.		
Long-term involvement of the Philippines in international climate change for a		
International advocacy role on the adverse effects of climate change, together with similarly situated islands/climate change vulnerable countries		
Undertake examination of potential for carbon sequestration (using forests and other means)		
Develop projects and programs for avoiding emissions using leverage from developed countries		
Develop climate change investment facility to create project pipeline		
Develop country strategy on climate change to consider GHG reduction and avoidance		
Undertake climate change actions consistent with the principle that the Philippines participation in climate change initiatives is predicated on the expectation that the goal of poverty reduction will be furthered. This is in recognition of the fact that the adverse effects of climate change contribute to poverty in the Philippines.		
Participate in international audits to determine compliance with climate change obligations by developed countries		

### III. Emission Reduction/Avoidance

Specific agencies and/or organizations, both government and private, that would play significant roles in the carrying out the actions/steps to reduce/avoid emissions were identified.

	<b>Agency/Organization</b>
Development and use of an efficient mass transport system	Department of Transportation and Communication (DOTC)
Use of compressed natural gas	Department of Energy (DOE), Department of Science and Technology (DOST), DOST
Political will - phase out of jeepneys and tricycles- contingent on the availability of alternative public transportation	DOTC, LGUs
Philippine Clean Air Act Implementation	Department of Environment and Natural Resources (DENR), DOE, DOTC
Regulation/incentives to encourage development and use of renewable energy sources	DOE, Department of Trade and Industry (DTI), Board of Investments (BOI), Congress
Research on low methane-emitting rice varieties and low methane emitting waste water treatment facilities; address contribution of agriculture	Department of Agriculture (DA), International Rice Research Institute (IRRI), DOST, Philrice
IEC to increase public awareness	Philippine Information Agency (PIA), Department of Education, Culture and Sports (DECS), Inter-Agency Committee on Climate Change (IACCC), DOE and attached agencies
Quantify costs of climate change actions versus "business as usual" scenario for possible funding	IACCC
Develop new and renewable energy (NRE), and clean and indigenous power projects	DOE, DOST
Energy efficiency	DOE, PCIERD, ERB
Promotion of mass transport, non-motorized and energy efficient modes of transportation	DOST, DOE, DOTC



# Philippines Climate Change Mitigation Program

*A Joint Program of the*



Philippines Department of Energy



US Agency for International Development

## SUMMARY REPORT

### CLIMATE CHANGE AND DEVELOPMENT WORKSHOP

March 27-30, 2000

Manuel M. Lopez Development Center  
Antipolo City, Philippines



Conducted by the:

**Harvard Institute for International Development**

Prepared by the:

**National Engineering Center  
University of the Philippines  
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Philippines, 1101**

*This report was prepared under the terms and conditions of Sub-Contract No. AD 201-8S-006. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the USAID and Hagler Bailly Services, Inc.*

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## 1.0 INTRODUCTION

The Philippines' Department of Energy (DOE) through its Philippine Climate Change Mitigation Program (PCCMP), an United States Agency for International Development (USAID)-supported activity, has organized national efforts to continue addressing global climate change. And because the DOE believes that knowledge and information are foremost instruments to address the climate change concern, it sponsored a four-day Climate Change and Development Workshop on March 27 – 30, 2000 held at the Manuel M. Lopez Development Center in Antipolo. The Workshop was not only a gathering of known leaders and advocates from multi-sectoral groups "championing" the cause of global climate change, but was a collaborative effort with the Harvard Institute for International Development (HIID). Current knowledge and information on the science and economics of climate change were enhanced by four distinguished climate change experts from the John F. Kennedy School of Government and the Harvard University Committee on the Environment.

## 2.0 OBJECTIVES AND TARGET AUDIENCE

The Workshop has been designed to provide the participants with an understanding of the key issues of global climate change and their implications for economic development. More specifically, the objectives of the Workshop were (1) to identify the gaps in understanding global environmental issues as these relate to economic development; (2) to empower the participants to participate more actively and constructively in global climate concerns; and (3) to analyze private and public sector innovations and initiatives to address climate change.

Representatives from the government, private utility, academe, private/professional organization, US agencies, and non-government organization who have the background

knowledge on and involvement in climate change and development activities were invited to the workshop

### **3.0 PROMOTION AND DISSEMINATION**

Invitations signed by the DOE Secretary Mario Tiaoqui were sent to the participants or to the heads of the organization who would nominate their qualified participants. These were hand-carried by a messenger and/or through fax or mail. A copy of invitation the (Appendix A) and the list of invitees (Appendix B) are included with this report as attachments.

Press releases regarding the workshop were also published in major dailies (Appendix C), namely The Philippine Star (March 26, 2000 issue) and The Manila Times (March 22, 2000 issue). Also published in major dailies were a series of articles on climate change issues.

Prof. Robert Stavins of HIID also appeared live last March 27 on "On-line with Gene Orejana" at the SNN Channel and discussed the topic "Climate Change and Us".

## 4.0 PROFILE OF RESOURCE PERSONS



### **MICHAEL B. McELROY, Ph.D.**

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Michael McElroy was recently named the first Gilbert Butler Professor of Environmental Studies at Harvard University. McElroy, an expert on the Earth's atmospheric chemistry, is also currently the Abbott Lawrence Rotch Professor of Atmospheric Science and has been a professor at Harvard since 1970. A renowned specialist on climate change issues, McElroy is also the chair of the University Committee on Environment (UCE) and heads the Interfaculty Initiative on the Environment. He is best known for his analyses of anthropogenic changes in the atmosphere, with an emphasis of how these changes affect climate, degrade air quality, and alter the amount of solar radiation reaching the Earth. McElroy is also currently an advisor to Vice President Al Gore on climate change issues through his work as Chair of Group Medea. He is credited with identifying the mechanism that is responsible for loss of ozone over Antarctica. McElroy is an active member of the China Council for International Cooperation in Environment and Development.



**ROBERT STAVINS, Ph.D.**

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**Robert Stavins is the Albert Pratt Professor of Business and Government at the John F. Kennedy School of Government, Harvard University. He is a University Fellow of Resources for the Future, Chair of the Environmental Economics Advisory Committee of the U.S. Environmental Protection Agency's (EPA) science advisory board, and Member of EPA's Clean Air Act Advisory Committee, the Intergovernmental Panel on Climate Change (IPCC), and the Harvard University Committee on Environment. He is also a contributing editor of *Environment*, and a frequent speaker for the Foundation for American Communications. He was formerly a member of the Board of Directors of the Association of Environmental and Resource Economists. Dr. Stavins' research has focused on diverse areas of environmental economics and policy, including examinations of policy-instrument choice under uncertainty, competitiveness effects of regulations, design and implementation of market-based policy instruments, diffusion of pollution-control technologies, and depletion of forested wetlands. His current research includes analyses of technology innovation, environmental benefit valuation, political economy of policy instrument choice, and econometric estimation of carbon sequestration costs.**

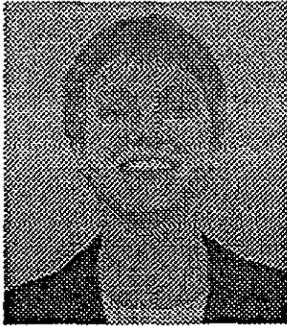
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**Alexander Golub** is currently a Project Director for the Harvard Institute of International Development (HIID) overseeing the USAID-funded EPIQ project in Central Asia and is one of HIID's leading experts on climate change issues. He has conducted workshops on climate change economics and policy issues in Russia, Uzbekistan, and Kazakhstan. Dr. Golub was leader of a World Bank study on greenhouse gas emission management in 1997-98 and is an accredited IPCC expert. Dr. Golub has approximately 20 years of experience in the field of environmental economics, natural resources management, and global climate change mitigation policy. He has been the lead expert in several international policy and advisory projects. Dr. Golub has successfully completed assignments for the GEF, the OECD, the World Bank, EDF, US EPA, Bureau of Economic Analysis, TACIS, Denmark's EPA, Czech Environmental Protection Agency, the Russian Environmental Protection Committee, and several regional environmental protection committees. Dr. Golub has published over 60 scientific papers in his field to date and currently serves as an advisor to the Russian and Kazakh governments.



## **ALIX PETERSON**

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**Alix Peterson** is a Graduate Student Fellow and Research Assistant at the Center for International Development at Harvard. She has previously served as a teaching fellow for the workshop on climate change and development at HIID and as Assistant Rapporteur to the 5<sup>th</sup> Annual United Nations Conference on Finance for Sustainable Development. She has also co-authored several papers on the subject of climate change and development with world-renowned Harvard economist Jeffrey Sachs under the auspices of the USAID-funded CAER II project. Ms. Peterson is currently researching climate change mitigation in Latin America and India and has taught classes at Harvard in Jeffrey Sachs' course on History and Theory of Economic Development.

## **TEACHING FELLOWS**



## **FLORDELIZA ANDRES**

Assistant Secretary for Policy and Program

Department of Energy

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Ms. Flordeliza M. Andres is the Assistant Secretary for Policy and Programs of the Philippine Department of Energy where she has been affiliated and held increasingly responsible positions since 1979. Her major responsibilities include the preparation of the Philippine Energy Plan, initiating policy research and formulation, promoting

international energy cooperation, and overall coordination of the implementation of the country's single biggest infrastructure project to-date in terms of investments, the US\$4.8-B Malampaya Gas-to-Power Project. She has directed various technical assistance programs and projects with international agencies and consultants, including the World-Bank Energy Sector Loan (1991-1994), the ADB-assisted Long-Term Power Development Study (1994), the USAID Technical Assistance to the Philippine Energy Sector Action Plan (1993 to 1996), and currently the ADB-assisted Philippine Gas Sector Policy and Regulatory Framework Project.

Ms. Andres has led and participated in Philippine delegations to international fora including the APEC Energy Working Group and Ministerial Meetings, ASEAN Senior Officials and Ministerial Meetings, and the UN-ESCAP Committee on Natural Resources sessions. She was also seconded to the ASEAN-EC Energy Management Training and Research Centre in Jakarta, Indonesia as Senior Researcher in 1990-91 where she was responsible for the ASEAN 2010 Project, AEEMTRC's initial study of the long-term supply-demand scenarios in ASEAN. She also had a brief engagement at the World Bank in Washington D.C. working on energy sector privatization and regulatory issues in developing countries. She has written and presented papers in various international conferences.

For her academic qualifications and training, Ms. Andres is a candidate for MPhil/Ph.D. in Energy Policy from the Imperial College Centre for Environmental Technology in the United Kingdom. She is a recipient of a British Chevening Scholarship. Her dissertation is on natural gas regulatory issues in developing countries. She obtained her degree of Bachelor of Science in Chemistry from the University of the Philippines and completed substantial MBA academic units at the Ateneo de Manila Graduate School of Business. She has also attended specialized training courses in energy and environment in various international institutions including the Second Executive Program on Climate Change and Development of the Harvard Institute for International Development in June 1999.



**MA. CECILIA DALUPAN**

Lawyer/Consultant

Environment, Energy and Natural Resources

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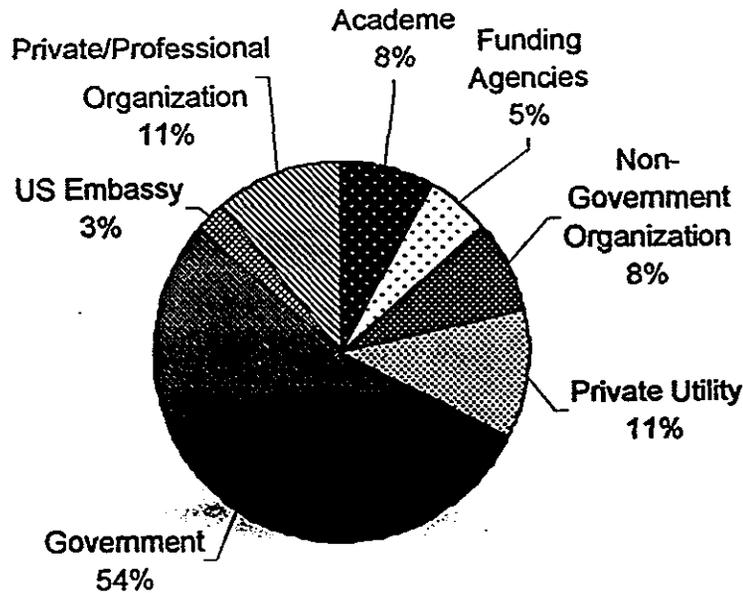
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Atty. Cecile Dalupan is a graduate of the Executive Program on Climate Change and Development at the Harvard Institute for International Development and the John F. Kennedy School of Government. She has assisted in the preparation of the Climate Change National Action Plan and evaluated project proposals for Activities Implemented Jointly. She has also participated in domestic and international negotiations relative to the UN Framework Convention on Climate Change as a member of the Secretariat, Inter-Agency Committee on Climate Change. She is currently involved in several activities dealing with climate change and mining issues in the Philippines. She has served as OIC-Undersecretary for Legal and Legislative Affairs of the Department of Environment and Natural Resources (DENR) and as Associate Attorney at the Carpio, Villaraza & Cruz Law Offices. She also teaches, on a part-time basis, at the Ateneo de Manila University's Legal Management Program and Loyola's School of Theology's Social Justice and Advocacy Program.

## 5.0 PROFILE OF PARTICIPANTS

### By Sector



#### Government

#### No. of Representatives

Department of Energy	3
Department of Environment and Natural Resources	1
Department of Foreign Affairs	1
Department of Health	1
Department of Public Works and Highways	2
Department of Science and Technology	2
Department of Trade and Industry	1
Department of Transportation and Communication	1
Energy Regulatory Board	2
National Electrification Administration	1
National Power Corporation	3
Office of Congressman Heherson Alvarez	1
Technology and Livelihood Resource Center	1

**Private Utility**

Davao Light and Power Co., Inc.	1
Manila Electric Company (MERALCO)	2
Iligan Light and Power, Inc.	1
Cagayan Electric Power and Light Co., Inc.	1

**Academe**

University of the Philippines	1
Polytechnic University of the Philippines	1
University of Asia and the Pacific	1

**Private/Professional Organization**

Manila Observatory	1
Philippine Electric Plant Owners Association (PEPOA)	1
Philippine Climate Change Information Center	1
Philippine Pollution Prevention Roundtable	1

**US Agencies**

US Agency for International Development (USAID)	2
US Embassy	1

**Non-Government Organization**

Institute of Climate, Energy & Environment	1
Philippine Network on Climate Change	1
Foundation for Philippine Environment	1

**Total Number of Participants 38**

## 6.0 WORKSHOP SUMMARY

### DAY 1 RECAP – MARCH 27, 2000

#### Morning Session

- Participants checked-in at 8:00 AM and had breakfast at the Pavilion. Mr. Edmundo Silverio of MMLDC gave an orientation on the facilities.

#### **Opening Program**

- Ms. Laura Mateo of Hagler Bailley hosted the opening program and led the singing of the national anthem. Mr. Tito Fortes of Technological and Livelihood Research Center gave the invocation
- Mr. Kat Tatlonghari of USAID welcomed the participants. He stressed that the overarching strategic objective of climate change initiatives is to bring nations closer together around basic principles of equity, transparency and common but differentiated responsibilities. He gave an overview of USAID initiatives such as the climate change action plan for FY 1998 to 2002. The significant component of the action plan is building institutional and human capacity to undertake meaningful participation in international efforts to reduce GHG emissions through policy advances and capacity building efforts.

#### **Workshop Overview and Objectives – Dr. A. Golub / Atty. M. C. Dalupan**

- Dr. Alexander Golub started the session by discussing an overview and the objectives of the 4-day workshop. Atty. Ma. Cecilia G. Dalupan then presented an overview of GOP initiatives.

### The Science of Climate Change – Prof. M. McElroy

- Prof. McElroy talked on the science of climate change where he discussed the global climate change situation and the increasing CO<sub>2</sub> concentration, specifically the following:
  - the greenhouse effect – what is it that determines average temperature of the earth
  - how does one predict what might happen as greenhouse gas emissions continue
  - different greenhouse gases: carbon dioxide, methane and nitrous oxide (N<sub>2</sub>O) and the sources of these emissions
  
- Extended exchanges and sharing of information: Points raised were as follows:
  1. There is a need to have a sense of the natural variability of the earth's climate.
  2. Humans are the only species who can think and who can realize the consequences of their actions and do something about them.
  3. Humans are moving too fast. We need to allocate responsibilities properly– equity is primary issue.
  4. All countries have a responsibility with respect to global climate change.
  5. Dealing with issues associated with methane and nitrous oxide are more complicated that dealing with CO<sub>2</sub>.
  6. Photosynthesis is a natural resolution to climate change concerns, so focus should be on reforestation, on using a permanent portion of land for trees.
  7. Note that people use a significant part of land for agriculture and other important uses, that there may not be as much freedom in withdrawing that land from agriculture use given food production needs.
  8. Deforestation always seems focused on the tropics.
  9. In a number of developed countries (like the US/UK), little or no deforestation but rather, reforestation is taking place; their experience of many, many years ago is that with the advent of the industrial revolution, their wood resources were depleted, so switched to coal or other sources of energy.

10. Developing countries are most vulnerable to impacts of climate change and the least capable of adapting. Is the US conscious of the consequences of climate change for other countries?
11. There is a range of attitudes in the US with respect to climate change.
12. The US must show, by domestic action, that they are serious about climate change, and not just 'buy' their way to compliance.
13. The challenge is to find ways to produce more wealth with less carbon.
14. There are various technological options but there is a need to provide incentives for innovation.
15. How can the Philippines afford mitigation when it can't even adapt to climate change consequences? As a response, it was suggested that the Philippines can continue its leadership role in international climate change negotiations to find creative options for developing country participation in the climate change regime.
16. Desire is to focus on what we can do, not what we can't..

### Afternoon Session

- The afternoon session started by a message by DOE Undersecretary Cyrill del Callar who emphasized that the Government of the Philippines (GOP) has done so much already to address climate change issues. These include the publication of the Philippine's Initial National Communication on Climate Change and embarking on three major programs with USAID, namely: Clean fuel, Energy efficiency, and Policy Development.

### **The Impact of Climate Change/Evaluating the Effects of Climate Change – by Prof. Michael McElroy**

- Prof. McElroy talked on how climate system works, what happens to particular regions of the world due to the effects of climate change, and presented predictive models that would describe the climate system but stressed that it is an enormous task.

- Questions / Points raised:
  1. What about vulnerability studies – how can we get funding for these?
  2. Note US Sec of State's significant statement where he said that international environmental issues are of importance to US foreign policy.
  3. Note recent CIA head's recent statement that international environmental issues are matters of US national security interest.
  4. Prof. McElroy's opinion: amend the Kyoto protocol to allow for a longer time line to enable countries to make better economic decisions, consider historical and present emissions; developing countries to determine what their emissions profile is and let that be their commitment

#### **Economics of Global Climate Policy – by Prof. R. Stavins**

- Prof. R. Stavins cited that environmental economics is not only limited to climate change but to different environmental issues. Economics also deals with human welfare.
- Two assertions:
  1. Causes of environmental problems are economic in nature. For example, an electric utility firm emitting pollution is hampered by constraints to cut back on pollution levels, which entails costs. Such constraints include the competitive market environment and fiduciary responsibility of maximizing returns to shareholders.
  2. Consequences of environmental problems have important economic dimensions. Externalities of environmental pollution are:
    - producer to another producer (pollution emitted by electric utilities to another company like laundry service)
    - producer to consumer (effect of pollution to a child's growth)
    - consumer to another consumer (smokers' effect to non-smokers)
    - consumer to producer (spilling popcorn in the movie theater would increase cost and increase prices)

- Economic value of environmental quality is whatever a person (society) would sacrifice for it. Environmental pollution that affects human health has economic costs, which include opportunity costs (decreased productivity, decreased happiness/quality of life, etc).
- A person or society's willingness-to-accept (WTA) or willingness-to-pay (WPA) is the economic value of environmental quality:
  - Willingness to accept (WTA) -- How much compensation are you willing to accept for the damages?
  - Willingness to pay (WTP)- How much would you pay to avoid it happening?
- Economic benefits of environmental policy are equal to the damages that are avoided. Look at the damages if the policy is not in place.
- Criteria for choosing pollution control levels
  1. Efficient level of pollution control - where marginal benefits equal marginal costs.
  2. Equity - Who gets the benefits and who pays the cost

### **Evening Session**

- **Introductions of participants – Asec. Liza Andres and Atty. Ma. Cecilia Dalupan**
  - brief sharing of background and expectations
- **Next steps – Dr. A. Golub & Ms. A. Peterson**
  - A description of the mechanics for the mini-workshop to be held on Day 3 and 4 was presented. Participants will break out into three discussion groups electing a rapporteur and a presenter.
- **Q & A - facilitated by Dr. A. Golub and Ms. A. Peterson**
  - Most discussed point was the clean air act IRR with various participants sharing their views and proposals.

## DAY 2 RECAP – MARCH 28, 2000

I. Recap of previous day's activities and lecture: Atty. Ma. Cecilia Dalupan

### II. Lectures/Presentations

A. Dr. Robert Stavins: *Economics of Global Climate Change*

*Lecture Objective: To provide analytical tools to analyze climate change issues – basic economics*

Summary of previous lecture on economics and the environment –

- Environmental problems:
  - that they are fundamentally caused by economic externalities – economic decisions that have negative impacts on the others (individuals, other firms and the like)
  - that their consequences have important economic dimensions

#### Criteria for choosing the optimum level of environmental protection

- Economic efficiency
  - maximizing net benefits
  - issue is who gets the benefits/who pays for the costs, i.e., *distributional equity*
  - benefits from investments in environmental protection are avoided damages, however they may be difficult to measure
- Cost-effectiveness
  - minimizing total cost
  - easier to analyze and less controversial

- danger is cost-effective way may not always be the efficient way, i.e., may be like “designing fast trains to the wrong stations”
- policy is cost-effective if it is the cheapest means of achieving target after considering alternatives, i.e., if policy instruments equate marginal cost of abatement across polluters

## Policy Instruments

### Command-and-Control

- a) Technology standards
  - all must use the same kind of technology e.g., the use of scrubbers as a technological approach to the problem of acid rain.
  - not cost-effective
  - not dynamically cost-effective (does not provide incentives to invest in new technology)
  - low monitoring/enforcement costs
  
- b) Performance standards
  - an improvement over technology standard because one has a choice on the use of the best technology available
  - may be of two types:
    1. uniform standards: not cost-effective; “sort of” dynamically cost-effective (provide incentive for innovation)
    2. non-uniform standards:
      - In theory, a better policy but poses information problems, i.e., government has to have information on all the firms’ marginal abatement costs.
      - Specific problems with non-uniform standard:
        - i) firms may not divulge the real situation
        - ii) firms may not know if they are low cost or high cost controllers
        - iii) may be politically infeasible to implement

## Market-Based Instruments

### a) Emission Tax

- for every unit of pollution emitted, tax is paid
- cost-effective
- dynamically cost-effective because it provides an incentive to look for the best use of technology to effect savings in the long run. This means lower cost to private industry. The idea is for each source to strike a balance between the tax and the marginal cost.
- depends on enforcement and efficiency of tax collection
- to know the tax level to set, government doesn't require much information; doesn't need to know marginal cost of pollution control for all firms but only the total/overall MC function or the supply function
- pollution tax is transparent , easy for consumers to calculate the cost of environmental protection, thus, from the economists' perspective, it enables individuals to make better decisions.
- for environmental advocates, transparency could be a problem because they want to have as much pollution control as possible
- bad news with Emission Tax
  - i) still has information problem (although at a smaller scale)
  - ii) regulated sector would not like it – maybe more expensive than command-and-control
  - iii) tax transparency
  - iv) the T (tax) word – people don't like taxes

### b) Tradable Permits

- firms can trade permits to emit pollution and undertake abatement in areas where it is cheaper to do it
- equity issue: it makes a difference how the permits are allocated
- emission targets are set by government, market/firms determine the cost of doing it

### Economics of Technological Change for Global Climate Policy

- Different policy instruments are anticipated to have different effects on technological change
  - Market-Based Instruments
  - Command-and-Control
  
- Process of Technological Change
  - Invention
  - Innovation
  - Diffusion
  - Utilization
  
- Factors affecting diffusion
  - Change in price – for a 10% change in price, adoption is less than 10%
  - Adoption cost subsidies more effective than taxes
  - Regulations had no discernible effect

### **Kyoto Protocol**

- Emission reduction targets
  - To appreciate emission reduction targets, one has to know about country's energy circumstances, e.g., Australia is a coal exporter
  - In the case of Russia, economy collapsed prior to 1990, hence, emission was way below targets
  
- Joint implementation
  - concept is good for financial transfers but flawed as a climate change measure
  - problem is lack of observable baseline
  - mere turnover of capital stock results in efficiency
  - "hot air" issue : countries getting more permits than what they need and selling them

**B. Atty. Ma. Cecilia Dalupan: Potential Impacts of Climate Change in the Philippines**

- Temperature and rainfall impacts of climate change
  - Average increase of 2 to 3<sup>0</sup>C in annual temperature
  - increase in rainfall distribution in many areas
  
- These will have corresponding impacts on:
  1. Water Resources – great variability in rainfall with respect to time will have significant implications on water availability. The water requirement of the agricultural sector will be impacted due to increased crop activity. With respect to domestic water consumption, the expected increase in temperature will surely have an effect although a quantitative analysis has yet to be identified
  
  2. Coastal Resources – climate change may aggravate existing coastal problems and lead to a range of impacts including sea level rise, changes in storminess, precipitation and freshwater availability. Accelerated sea level rise may also affect physical and biological systems along the coastal areas, as well as port and coastal infrastructure as well as traditional lifestyles and culture in the coastal zones.
  
  3. Forestry - Climate change may increase the rate of conversion of forests to agricultural lands due to human migration from areas degraded by drought and erosion to more productive forestlands. It may accelerate forest loss, increase runoff resulting in soil erosion and floods. Local biodiversity may also decrease. It may have severe impacts on mangroves.
  
  4. Health – Although further studies need to be done, rough projections show that there is an association between climate change and the incidence of diseases such as those with are droplet-spread (ex. Bronchitis, pneumonia etc)

*Comments and suggestions*

1. List down strategies to be undertaken by the country for both climate mitigation and adaptation activities. Presently, there are no comprehensive studies on the impact of climate change for the Philippines, as well as the budgetary requirements to address this problem. At the moment though, there is no national budget allocation for climate mitigation and adaptation activities.
2. There should be concrete plans on how to inform the people about the climate change problem. Although local action planning consultations were done but these were limited in nature. Only a few provinces were included due to budgetary deficiencies.
3. There is a need for inter-departmental efforts to address these climate problems. More serious studies should be conducted quantifying the effects and impacts of climate change in the country e.g. intensity of soil erosion, siltation and other problems.
4. The absence of accurate information for other provinces (e.g. inability to quantify accurately the rise in the sea level in the province of Jolo) is due to the absence of sufficient data on these areas.

**C. Flordeliza Andres: Philippine Greenhouse Gas Inventory and Potential for Reduction**

- 1994 GHG inventory (by the Manila Observatory)
  - Energy sector is the biggest contributor to CO<sub>2</sub> emissions (50%) followed by agriculture
  - Among the energy consuming sectors, the energy industries (power generation) and transport account for the highest contributions to CO<sub>2</sub> emissions

- Energy Situation and Outlook
  - There is a significant decline in oil dependence especially for power generation since the early seventies due to availability and efforts to harness hydropower and geothermal power
  - Energy demand will almost double within the next ten years based on economic growth targets
  - Oil dependence will further decline due to availability of natural gas and increased hydropower use
  - Biomass utilization will remain significant, and its large-scale for rural electrification use is being promoted particularly
  
- GHG Forecasts
  - by the energy sector will almost double within the next ten years corresponding to the projected increase in energy consumption
  
- Energy Policies and Programs
  - Policies and programs remain anchored mainly on self-sufficiency/energy security objective but there is also an increasing emphasis on clean fuels/technology and energy efficiency
  - Energy industry restructuring will be more aggressively pursued to promote overall energy sector efficiency
  - Equity considerations may lead to some subsidies, e.g., for expansion of rural electrification and to lower electricity cost to marginalized sectors

### *Comments and Suggestions*

1. Energy sector appears to be doing enough to reduce dependence on dirty fuels and promote energy efficiency but what about the transport sector? Options for fuel substitution not yet feasible but other things could be done, e.g., road and traffic maintenance, mass transport.

2. Impact of energy policies and programs resulting mainly in avoidance of GHG emissions but there are also some that will result in reduction, e.g., retirement of oil-based thermal power plants.

### III. Discussion/Wrap-up

Dr. Golub asked the participants to identify the most pressing impacts of climate change and major areas for greenhouse gas reduction. The results are as follows:

- Four most pressing impacts of climate change:
  - a) Increased probability of flooding due to rise in water level
  - b) Accelerated sea level rise
  - c) Decrease in food production
  - d) Health problem
  
- *Five Major Areas for Greenhouse Gas Reduction*
  - (a) Energy industry restructuring
  - (b) Switch to cleaner fuels e.g. natural gas
  - (c) Further development of hydroelectric energy
  - (d) Greater use of geothermal energy
  - (e) Energy efficiency such as heat rate improvement in power plants and other measures

#### IV. Discussion with Prof. Robert Stavins

Small group discussions were concurrently held with Prof. Stavins, which gave some participants an opportunity to further clarify some issues on climate change. The following are the highlights of the discussions. Questions from participants are shown in italics, followed by Prof. Stavins' response.

- *What is the real cost of carbon sequestration?*

The real cost may be difficult to quantify. For example, in the illustration made regarding planting trees, one has to look at the downstream effect of planting trees. For it's true that there are benefits of having trees rather than agriculture but there are also other costs. On the energy side, switching from coal to natural gas results not only in the reduction of CO<sub>2</sub> but particulate also. Carbon sequestration doesn't just result to changes in CO<sub>2</sub> but all those other gases or changes in infrastructure. There are so many things to consider so it becomes extremely difficult to make adjustments in everything. So rather than doing the analysis perfectly, you can just look at the changes on CO<sub>2</sub> but then again, the analysis must also be balanced.

- *Would the analysis of carbon sequestration be more applicable in a developing country? And would the results be different?*

There's very little good work done to know what is the real cost of carbon sequestration in any country, let alone a developing one. Yes, the results would change from one country to another because of population density, etc.

- *Would the use of emission tax or tradable permits be advisable for developing countries like the Philippines?*

The use emission tax or tradable permits is mainly a political choice. In the Philippines, the use of taxes is an incentive for companies to lessen their pollution levels.

*Comment from a participant:*

In the Philippines, we should look more into treaty bargaining emissions with developed countries since we don't have enough resources to combat the problems of climate change. Like when Mt. Pinatubo erupted, we spent billions of pesos fighting the effect of the volcanic eruption and damage prevention, which I think was useless, instead of setting up new housing for the people and other socio-economic programs. The developed countries would definitely not give their production to lessen GHG, while in our case, the marginal cost of doing so would be lesser, so I think this would be a good opportunity for us to make a good bargain with them.

*From Prof. Stavins:*

The emission trading would only begin if Kyoto Protocol comes into force. But there are fundamental problems with the Kyoto Protocol so there might be subsequent international agreements.

- *In conditions of rapid economic growth, is there a difference between the performance anticipated by tax or tradable permits?*

In conditions of economic growth, emissions will increase with the tax program while with the tradable permit program, emissions will not increase because of the cap. There is going to be a rearrangement and the permit will rise. Thus, if a country that doesn't have rapid economic growth, having a tradable permit program is fine. But a country with rapid economic growth, a tradable permit program that is capping emission might be considered too severe because one might be interested be in lowering pollution per unit of GDP instead of pollution per se. If the cap on tradable permits is not followed, does the firm get penalized? Yes. There has to be a penalty. For example, in the tradable permit program of US for acid rain, the penalty for each ton of emissions above the permitted a month is \$2000 per ton. The marginal cost of control -the price of a permit is about \$100 per ton. So it's a strong disincentive for the firm. The suggested step if you develop a tradable permit program: the penalty per ton of emission must be much greater than what the marginal cost of control must be.

- *How do Americans feel about climate change?*

There is a small part of the population that is environmentally active and that are aware of the dimensions of the problem or threats. If people were going to rank the importance of climate change as part of their concerns/issues (e.g. food, education), it would be down in their list. Global climate change is not a big issue for the average American but most people don't think that much about climate change. Information is available for people who are interested but how many people are involved in climate change issues? My personal opinion: if the American population have a greater understanding of the distribution of the damages of climate change and the feasible distribution of cost, they would be less willing to support action, not more willing. They would come to understand is that the greatest damage is not going to be in the US but in the developing countries and countries that are largely agriculture-dependent. One thing that Americans would worry about would be resort island, and this is a trivial impact if we're talking about worldwide. The US government position is that developing countries should be involved (participation) but should not pay.

- *Is it acceptable to the international community if the degree of commitment per country is proportional to the amount of carbon emission?*

It wouldn't be acceptable to China or India to take on that kind of cost. Again the important thing is to separate posture with regards to participation and posture with regards to cost.

- *What are the proposed measures for developing countries, like the Philippines, in solving the impact of climate change?*

One should separate the question of participation from the question of cost. An analogy is the issue of going out on a date vis-à-vis long-term commitment. But here's our point on cost: the developing countries have tremendous leverage because they're not going to pay. One thing to look at would be the web site of Framework Convention on Climate Change and look at the National Communication of Argentina that they recently released and the formula that they adopted for them. It would be something to start with but there are other approaches.

## **DAY 3 RECAP – MARCH 29, 2000**

### **I. Recap of previous day's activities and presentations: ASEC Liza Andres**

ASEC Andres gave a review of important points discussed during the previous day. Atty. Dalupan also made a clarification regarding the table presented previously on the potential projected accelerated sea level rise (ASLR), i.e. that there is no certainty as to if and when the country might be affected by this. Previous studies have identified only those areas which would be threatened in the event of ASLR. In this regard, it was noted that geological factors are relevant in determining whether there is really sea level rise or subsidence. Consequently, care should be taken when making projections and further studies are needed.

Others noted that there are areas where ASLR is already being experienced and that these should be documented. This would be necessary for emergency-preparedness programs and would allow us to prepare mechanisms for adaptation. Others noted that there have been many initiatives aimed at raising public awareness but more areas still need to be reached especially since all sectors stand to be affected. It was suggested that an action plan should be made by all sectors including the government and private sector.

### **II. Benefits from GHG Mitigation Energy saving, Productivity of Agriculture, & Human Health Protection – Prof. M. McElroy**

Prof. McElroy began by pointing out the difficulty in assessing sea level rise, but that the global rate of sea level rise is about 10 cm. He then proceeded with a review of the experience of developed countries during the industrial revolution, and the 'environmental mistakes' they made in the process. Thus, developing countries have the opportunity to learn from these mistakes in their own paths toward development.

By way of examples, he pointed out the experiences of the US with coal burning in the 1940's, acid rain and 'bad' ozone in more recent years. Negative environmental impacts of industrial activities were accepted as part of the 'price of progress' until a wake-up call occurred in the form of health problems and even fatalities. Government was then pressed to take corresponding measures by citizens themselves, particularly at the local levels. One of the challenges in addressing environmental problems is technological. When the sources of the problems have been identified, technological changes may be introduced to respond to these sources.

Developing countries may have the opportunity to do better by not committing the same mistakes as the those made by western countries. The challenge is to analyze what can be done differently, so that the price of progress is not air quality, health or other environmental concerns.

Environmental problems are not all local, however, but can have transboundary effects. Pollution emitted in one area is not contained therein but can affect other areas and even countries. Consequently, these are not only domestic issues but international issues calling for international responses.

Climate change issues affect the world as a whole. The attitude that one is only responsible for the problem in one's own country will not help. With respect to CO2 reduction, there are a number of ways of going about this. Conservation and more efficient use of energy is the first thing to do. Next step is to switch from coal or oil to natural gas. Natural gas is the cleanest in emission. He noted that the Philippines is the second largest producer of geothermal energy.

### *Comments and Questions*

In response to some questions raised, Prof. McElroy stated that assuming CO2 emission is completely eliminated by the USA, the problem will be repeated by China and other

developing countries. So, there is a need to involve the other countries, especially the developing ones. Rich countries should limit their use of energy. A comment was then made that the Philippines' energy plan shows that we are aware of the issue but that we need to see equitable distribution of responsibilities. We can discuss options but we can't draft Philippine decisions. We can only identify ways to avoid emissions. We want transfer of technology to address the issue.

It was also pointed out that the Philippines is aware of the issues but we don't have the resources for mitigation plans. There should be good coordination because we have so many think tanks. We should have a practical approach and better relationships among the entities concerned. Concern was raised over how developing countries can level the playing field in terms of addressing the climate problem.

Finally, it was suggested that instead of debating the effectiveness of the Kyoto protocol, we should ask what other countries are doing and what we can do. Prof. McElroy pointed out that creative measures can be sought as in the case of BP Amaco which has imposed the Kyoto standard on its internal operations.

### **III. Mini-Workshops / Break-Out Groups**

After receiving general instructions from Dr. Golub, the participants were divided into 3 groups to discuss 'next steps' on the following:

- Adaptation
- Role of the Phil in the international arena
- GHG avoidance/reduction

Each of these groups selected their 'leader' and recorder while the HIID faculty, teaching fellows and workshop staff joined them as observers.

#### **IV. Emissions Trading Simulation Exercise**

The participants were divided into teams after which Ms. Alix Peterson gave a briefing on the objectives and mechanics of this exercise. The teams represented companies which were now tasked to design their operating strategies in the light of emissions trading regulations which required their industry to reduce SO<sub>2</sub> emissions by 40%. With 2 free permits representing 200 tons each of SO<sub>2</sub> emission allowances, they then had to decide how they would 'play' in the market with the goal of making as much profit for their company. After studying their options, a government auction was held, followed by an auction of permits which some of the companies wanted to sell.

The big winner in the emission trading simulation game was the Faraday firm with 17 M in profit. Some firms shut down, some had modest profits, while others suffered huge losses. Ms. Alix Peterson then discussed the results with the whole group. She pointed out that the trading system allows companies to take advantage of their differences in abatement costs, whereas under a command-and-control scenario, all companies are made to comply with the same standard regardless of their appropriateness to their specific circumstances. She also pointed out the following important issues with respect to emissions trading:

- Transactions Costs
- Learning
- Market Power
- Information Requirements

#### ***Comments/Questions***

- We gain benefit from the experience because we in the energy sector can prepare for the future and we will know how to handle firms. It gave an idea of how the firms decide and what their requirements and considerations are.
- Emission monitoring is costly.

- The standard is set by Congress or some other entity, and may not always be the 'right' one.
- For an international trading situation under the FCCC, trading would be through governments

## V. Presentation of Group Report

The leaders of the 3 different groups which participated in the Mini-workshop in the morning then presented the output of their sessions. The major areas of discussion were adaptation, the role of the Philippines in the international arena, and GHG avoidance/mitigation.

### A. Group 1's Output

#### *Adaptation*

1. Executive Order on Climate Change
  - IEC
  - Build baseline information for monitoring geogenic and anthropogenic CC effects
  - Conduct vulnerability assessments to determine appropriate adaptation measures esp. for most critical sites/sectors
  - Study factors complicating CC effects assessment such as subsidence due to groundwater extraction and rising sea level.
  - so that CC concerns are integrated into the national development plans and programs
2. Climate Change Act

*Country's Role*

1. To continue participation in the development of mechanisms and institutions for the eventual entry into force of the Kyoto Protocol taking into consideration equity, transparency, efficiency, ...
2. Minimize GHG emissions
3. Lead by example: thru legislation, IEC, etc.
4. Aim for SD: for equitable distribution of resources and opportunities.

*Emissions Reduction/Avoidance*

1. Prioritize CC concerns re the Transport sector
  - development and use of an efficient mass transport system
  - compressed natural gas
  - Political will – phaseout of jeepneys and tricycles
  - Philippine Clean Air Act implementation
2. Regulation/incentives to encourage devt. and use of RE sources
3. Research on low methane-emitting rice varieties; address agri contribution
4. IEC to increase public awareness
5. Review Power Development Plan to minimize CO2 emissions.
6. Quantify costs of CC actions vs. “business as usual” scenario for possible funding.

**B. Group 2's Output**

*Adaptation*

- Enhance IEC activities
- IACC to spearhead activities using the Pangasinan experience as model
- Get resources/necessary funding
- Tap concerned agencies (national government, NGOs, LGUs, etc) to ensure 100% (nationwide) coverage
- Identify projects that could be implemented through the leagues (League of Municipalities, League of Cities, etc.) and the timetable for project implementation
- Determine funding sources and mechanisms

- Set-up monitoring body/group that will evaluate projects

*Philippine Role in the International Arena*

- Strongly advocate the immediate ratification of the Kyoto Protocol; it could be insisted that the Kyoto Protocol be ratified soon even if there is no definition yet of the nature of participation of the developing countries considering that it is the developed countries which contribute the most in GHG emissions.
- Long-term involvement of the Philippines in international climate change for a
- International advocacy role on the adverse effects of climate change
- Examination of barriers (implications and loop holes) to using forests for carbon sequestration
- Develop projects and programs for reducing emission using leverage from developed countries
- Participate in international audits and inspection of effects of climate change

*Local GHG Emission Reduction/Avoidance*

- Develop new and renewable energy (NRE), and clean and indigenous power projects
- Energy efficiency
- Promotion of mass transport, non-motorized and energy efficient modes of transportation

**C. Group 3's Output**

*Adaptation to Climate Change*

**Macro Level**

What	Who
1. Vulnerability Assessment to climate change (site specific)	Inter-agency Committee on Climate Change (IACCC) expert scientis Local government Civil Society National Agencies Academe
2. LAP model for response to vulnerability	FPE Sectoral experts academe
3. Information dissemination on vulnerability and response to climate change	Church Climate Change Information Center (CCIC) Non-government organizations (NGOs) Local government Media
4. Coordinating mechanism among concerned agencies	CCIC National Disaster Coordinating Council (NDCC) Phil. Council for Sustainable Development (PCSD) IACCC
5. Use El Niño phenomena as jump off point for action	Strategy for 1 & 2

**Micro Level**

What	Who	When	Resource
i. Information dissemination			
a. Conference fora	CCIC	Monthly	donors
b. Printed materials			
-bill inserts	Utilities(VECO, MERALCO)	Monthly	IACC, GF
-primers	Foundation for Phil. Environment	April	FPE, USAID
-handouts	(FPE)	April-May	FPE, USAID
-video/slides	FPE	monthly	National Gov't
c. Advocacy seminars on energy-efficiency & safety, power patrol, and transport patrol	Department of Energy (DOE)		

The group then discussed and made clarification on various points raised about the outputs. These would be consolidated by the group leaders together with the HIID team for presentation to all the participants the next day.

## VI. Discussion with Prof. Michael McElroy

A small group discussion was also simultaneously held with Prof. McElroy wherein the participants were able to ask pertinent questions about climate change. Below are the highlights of the discussion. Responses of Prof. McElroy are presented after each question from participants.

- Prof. McElroy discussed some points of view/attitudes towards climate change, as follows:
  1. Natural phenomena – predictive change of climate is not due to greenhouse gases but due to natural phenomena
  2. The sunlight data from a 10-year period (1980-1990) do not show much change in temperature so skeptics would say “What’s the problem?”
  3. Everything is uncertain and besides global climate change is good and provides some advantages such as a warmer climate for countries with higher latitude, lesser money spent to move snow during winter, more agricultural benefits because the growing season is longer, etc.
  4. A lot of these climate models are deficient, thus there is no basis to assume that a particular model will work out. The cost of dealing with the models is enormous and the models may not be reliable, so why not just wait and see what the problem is.

Prof. McElroy personally thinks these attitudes are foolish because there is no way to adequately estimate the cost involved in doing nothing. One cannot assess the value of uncertainties.

- *Assuming that the Filipinos are believers in the effects of CO<sub>2</sub>, how can the Philippines succeed if the US Senate hasn't been convinced to take action on all of these considering that these are people who are supposed to be knowledgeable on what's supposed to be done?*

If you go back to 1988, global warming in the US became a big issue because it was a hot summer in the US. In addition, there was a political focus in the issue. It

was the time when the Reagan administration was giving free rein to the business where they could do almost whatever they want. In response to that, people were saying that government has a role to play. Thus, the feeling that nations of the world could come together to deal with global policies came about. Several meetings among nations ensued to deal with the issues of climate change. And these meetings became more complicated because some of the developing countries were saying "Hold on, you're telling us what to do with our lives". So people were beginning to realize that there are differences in attitude towards the issue.

The United Nations Geneva meeting came up with the statement that climate change is an extremely serious problem of the world and we had to deal with it. This eventually led to the Framework Convention on Climate Change, it led to the Rio de Janeiro meeting. The summit convened 50,000 delegates where half of the world leaders were there. In the case of the U.S., George Bush went there. Because of that pressure, the US was no. 4 to actually sign and ratify the Country Convention in the Rio de Janeiro. So George Bush submitted it to the Senate where it was ratified unanimously.

The commitment of the Rio Protocol was that countries would voluntarily act to reduce their emissions. For a vibrant economy, voluntary action would be very hard. But this was one of the things that the US government did in 1992, aside from their concern of the budget deficit. To reduce the deficit, you needed to raise taxes in some way. Al Gore had the idea that a good way to do that would be to bring in the carbon tax or an energy tax. Unfortunately that became a political football and the Republicans picked on that. And what was eventually passed was an increase of gasoline tax for a couple of cents per gallon. But the fact that the Democrats have commitment to tax on energy, of all things, had a direct impact on the Democrats losing control on the House of the Representatives. The president may be convinced of the seriousness of the problem so he made it very clear that he will not address the problem by using taxes. So it became suddenly a politicized issue.

Al Gore is in White House. He's hammering the issue when he is not responsible. Now he's doing nothing about it so the environmental people are saying, "Where's the action?" The Republicans are saying that Gore is an extremist and he does not understand the issue and is exaggerating the issue.

- *What are the constraints of the Kyoto Protocol?*

My view is that the Kyoto Protocol in its present form doesn't work for a lot of reasons. For one, the commitment that is required from the US cannot be met except by spoken words or by buying emission right from Russia and Ukraine. But that doesn't control emission at all. It just sends dollar to these countries. Second, the Kyoto Protocol could be met by CDM mechanisms in ways, which are not yet defined.

- *How can developed countries help address the issues of climate change?*

Developed countries need to make a serious commitment to reduce emission domestically and then to develop technology that allows that to happen and to find ways to deploy that technology to other countries. The technology could be developed first, like for example the transportation sector, where there is an opportunity to move towards fuel cell technology. But it's a little bit expensive so how can you push it a little bit faster? It's difficult for government to directly subsidize that technology. Converting to fuel cell technology would be expensive for auto companies. But if there is a serious tax on gasoline prices in the US, then the public would demand more efficient cars. Then the automotive industry would respond to that. Another way would be to improve the emission standard of cars through regulation.

Some countries like the Netherlands are taking the problem seriously. They have resorted to bicycles as form of transportation. And yet it's very strange to see the reaction of in different countries to using the bike as transport. In Beijing, China for example, there was a move made to ban bicycles because these were interfering with the traffic. Their idea was you burn less fuel and you would have less congestion if you remove bicycles because the cars could go faster. In Japan, cars can also be used for 4 years and cannot be registered on the 5<sup>th</sup> year so they can sell them to other countries that can still use them. It doesn't cost a lot more to have a clean car than to have a dirty car so Philippines should not be a dumping ground for used cars. There should be a certificate of compliance for the required amount of emission for used cars. It should also be illegal to use leaded gasoline in unleaded engine but there are some regions where you can only get leaded gasoline.

- *Please elaborate on the economics of carbon sequestration.*

The best way to address the problem is to stop burning forests since this is destructive to the local people and ultimately destructive to the environment. Reforestation is a fairly good idea particularly in regions where the environment is suffering. What the Chinese are doing for example to encourage the conversion of partial agricultural land, land of high slopes, to productive forests is a good idea. It is also a good way to try to cut down our flood damage. Turning lands into forests might be an expensive operation and probably overly counter-productive. One might spend energy, fertilizer and a lot of things to create the forest and maybe in the process it's not worth it.

- *How can internal expertise be enhanced in developing countries?*

It's very important for developing countries to develop internal expertise. We also had to get past the point of relying on GCM. There's a lot more work to do with GCM and there's a tendency for people to simply run the model and not critically think about it. So there's an important role for smart people in developing countries in these exercises. For example, you could try to accurately develop the record of the Philippine climate as far back as you could possibly get (five thousand years ago, four thousand years ago, etc.), in as much detail as possible – rainfall, temperature, seasonality, el niño, la niña, etc. As you do that, you would analyze how or why did that happen and you could get smarter on what might happen in the future. The development of human resources could be a way to establish database that would form the parameters for decision making.

- *How can countries sustain climate change activities?*

The complex issue of climate change could finance an institute, not only on a project basis, but work for a lifetime (e.g. collaborative work, Ph.D.). Insurance companies could be tapped to support such an institute. In the US, some companies are leaving their money in foundations, which are looking for important contribution to society's welfare. By US law, these foundations have to dispose a minimum of 5% of

their assets every year. Hewlett Packard, for example, has set-up a foundation. There are opportunities for companies to influence the society's situation. However, insurance is not as popular yet, here in the Philippines as compared to the US. But the trend now is to move towards having a national insurance. The World Bank and International Organization are seriously trying to push countries towards buying insurance. For example if a country experienced a disaster, like what happened to Nicaragua, then what happens is the entire economy suffers a setback, the infrastructure is destroyed, and people are in dire straits. The only way is foreign aid, public giving, or going back to World Bank for a loan, which is not a smart way to do. The smart thing to do would be for World Bank to be able to assess in advance the probability of a disaster happening and have that built into budgets.

*Comment from a participant:*

In the Philippines, the whole of Catanduanes was devastated last year by an extremely strong typhoon that razed down the whole province. If the country had some kind of a funding that could have rebuilt the infrastructure right away, even the homes of the people, then everything could have been back to normal in a short amount of time. But we don't have that kind of mechanism. The government of the Philippines could not afford to have this kind of disaster year after year.

## **DAY 4 RECAP – MARCH 30, 2000**

### **I. Recap of previous day's activities and lecture: Atty. Ma. Cecilia Dalupan**

- **Comments:**
  - BP Amoco example in the emission trading transactions should be deleted because it might become an advertisement for them; otherwise, other companies should also be cited.

- Lessons learned from Philippine experience with independent power producers could be applied to international emission trading where similar issues might arise: large firms with significant market power, transaction costs due to brokers and interlocking contracts to secure market and political risks, and information asymmetry -- inadequate information and the high cost of acquiring them.
  
- Kyoto Protocol has to be explained and the context in which emissions trading and other flexible mechanisms are discussed.

## II. Lectures

### A. **Alix Peterson: Environmental Valuation: Local Pollution Reduction, Human Health Risk Analysis, and Health Benefits**

*Lecture Objective: To provide valuation tools that are useful not only for measuring environmental quality but also for other public services*

- Questions to answer in analyzing environmental benefits-
  - Why do you care about measuring benefits from the environment?
  - Why are the benefits we derive from the environment hard to measure?
  - How should we think about the range of benefits?
  - What types of economic methods can we use to value the environment (stated and revealed preference)?
  
- Benefits hard to measure because there is no market or prices for these "goods", e.g. clean air. One of the tools that can be used in measuring environmental benefits is the valuation method. It is a guide in making decisions. Valuation tools gives a sense of dollar value to avoided damages.

- **Common Applications** – we are interested in valuing changes in:
  - Air and water quality, soil productivity, noise level
  - Quantity of service and potable water
  - Health and size of biological populations
  - Risks to life or morbidity
  
- **Valuation Concepts and Techniques**
  - There are two major types of environmental valuation techniques: *monetary* and *non-monetary* or *physical*.
  
  - Direct valuation techniques determine the monetary values individuals place on receiving environmental amenities or avoiding environmental costs. Non-monetary or physical valuation techniques (sometimes called indirect valuation techniques) measure physical environmental impacts themselves, e.g., tons of pollution emitted and their health effects) without directly placing a monetary value on those impacts.
  
  - Values that monetary techniques measure can be broken down further into two categories: *use* and *non-use* (sometimes-called *passive use*) values.
    - a) **Use value:** a consumer's enjoyment of an attribute of a resource by directly using it or appropriating it, e.g., all market goods, recreational services, air quality near the home
    - b) **Non-Use Value:** a consumer's indirect or unobservable enjoyment of an attribute or resource, e.g., distant or unique ecosystems
  
  - 1. **Option Value** – value placed on the existence of an environmental good or service because they may be used in the future. contingent valuation, hedonic prices

2. *Existence Value* – value placed on an environmental good or service that is unrelated to the consumption of that good or service.

There are three reasons given why people might care about the existence of some species or places: *bequest* motives (individuals wish to provide their descendants with environmental resources); *gift* motives (usually to members of the current and not the future generation) and *sympathy* motives (out of respect and sympathy for rights of species).

- **Valuation Techniques**

1. **Productivity Cost Model**

- *Amenities that this method can value: changes in human or agricultural productivity as a result of changes in environmental quality*
- Concept: damage (dose response) functions can be estimated by scientists using epidemiology or agricultural statistics
- information about changes in output can be multiplied by market or shadow prices to monetize the damages
- Caveat – damage functions may be difficult to estimate, behavioral responses to changes in environment quality must be considered
- Consider whether the change in environmental quality will result in a marginal change in output, with unchanged prices, or whether prices will be expected to change

2. **Opportunity or Replacement Cost Model**

- Amenities that this method can value: changes in air or water quality or changes in animal habitat
- Concept: estimate the value of environmental damage based on what it would cost to remedy or replace the damaged environmental asset or service
- Estimate the value of lost economic opportunities

### 3. Travel Cost Model

- Amenities that this method can value: recreational sites, cultural sites, health clinics, which usually have a zero or nominal admission price.
- Concept: visitors at different distances from a site face different travel costs or prices; by observing the number of trips taken at these different prices we can estimate a "demand function" for the site; integrating under that demand function gives the average annual consumer surplus (willingness to pay) per visitor

### 4. Hedonic Pricing Approach

- Amenities that this method can value: air and drinking water quality, noise proximity to waste sites
- Concept: Hedonic pertains to pleasure. Differences in values can be attributed to pleasure derived from the positive characteristics of goods, e.g., housing (and land) is made up of several characteristics that determine its value- beautiful view or noise and smell; the total price of a house is the sum of the implicit prices for each characteristic (bundled price); these implicit prices can be estimated statistically
- Assumptions: consumers have good information, low transaction costs, and may choose any combination of characteristics, i.e., there is a market for houses and people are moving at will.

### 5. Contingent Valuation

- Amenities that this method can value: can be used for all amenities but is most important for valuing resources that have mostly non-use value
- Concept: even where people do not spend money and reveal their willingness to pay for an environmental benefit, it should be possible to confront them with a hypothetical market and ask them
- Criticisms of the contingent valuation method:
  - a) Respondents do not understand what they are being asked to value
  - b) Respondents give answers that are inconsistent with economic theory

- c) Respondents do not reveal true WTP or do not take surveys seriously (warm glow effect)
- d) The survey design may encourage bias even if people wish to reveal their WTP (e.g. starting point bias)

- ***Benefit-Cost Analysis***

- Benefits: Willingness to pay rather than go without the project
- Costs: Opportunity cost-best alternative use of resources

**Procedure for analysis:**

1. The project(s) to be analyzed are identified
  - Choose the correct counter-factual to the proposed project
  - Use shadow prices when market prices are distorted by taxes or subsidies
2. All impacts of the project, favorable and unfavorable, in present and future are identified
3. Values are assigned to these impacts.
4. For each period, the net benefit is calculated.
5. The total stream of net benefits is added-future periods are discounted. Issue is the right discount rate to use.

**B. Dr. Alexander Golub: Framework Convention on Climate Change:  
Technology Transfer & Joint Implementation**

*Lecture Objective: To explain the proposed mechanisms for international cooperation*

- **Technology Transfer**

Article 4.5 (UNFCCC): "The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance,

as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention.”

#### **Parameters**

1. GDP – higher GDP results in higher CO<sub>2</sub> emission
  2. GDP Structure - nature of economic activities, e.g. if country has steel production, higher CO<sub>2</sub> emission
  3. Energy/GDP or CO<sub>2</sub>/GDP
- Comment from participant: If technology transfer will sustain growth, why is it that the commitment of developed countries does not include technology transfer? Why is technology transfer not taking place? Issue on technology transfer is different from the new mechanism.
  - Response from Dr. Golub: New mechanisms were introduced in the Kyoto Protocol with real case of technology transfer.
  - Response from Dr. McElroy: Language/words used in the provisions of the protocol are ambiguous

#### **C. Dr. Alexander Golub: CDM and Joint Implementation & Emission Trading: How a Non-Annex 1 Country Can Participate in the Kyoto Flexible Mechanism**

- ***Clean Development Mechanism (CDM)***

Article 12 (KP): “The purpose of the clean development mechanism shall be to assist Parties not included in Annex 1 in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included

in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.”

*The Rules for CDM*

1. CDM is subject to the authority and guidance of the COP and will be supervised by an executive board of the clean development mechanism
2. Emission reductions resulting from each activity shall be certified by operational entities;
3. Reductions in emissions that are additional to any that would occur in the absence of the certified project activity

• *Joint Implementation & Emission Trading*

For the purpose of meeting its commitments under Article 3, any Party included in Annex 1 may transfer t, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy.

Emission Trading Concepts

- Carbon emission has different prices for different emitters; different countries have different expectations; WB estimate is US\$20/ton of CO<sub>2</sub>
- Companies which are low-cost controllers believe prices should be lower; those with no options for reduction have higher price expectations
- Emission trading works as a secondary market for carbon allowances.

**CDM vs. Emission Budget Trading**

Transaction	Distribution
Reduction	Transaction
Approval	Compliance
Certification	

**Baseline & Additionality**

1. Project by Project
2. Business as Usual
3. Additional Reduction only
4. Incremental Costs

\* Additionality and incremental costs create difficulty in projects.

**Philippines on GHG Market**

- Philippines is a price taker
- It is important to minimize transaction costs from certification and verification process

**Minimum Elements to Participate in Flexible Mechanisms**

- a legal obligation that specifies a limitation of total emissions of the pollutants of concern i.e., an emissions cap
- measurement of emissions; reporting and tracking of emissions and transactions
- fungibility: defining what is to be traded
- accountability
- consistency
- transparency

**Investment Facility**

- the project category
- achieved greenhouse gas (GHG) offsets
- costs of implementation

- project additionality
- compliance with national and international requirements

*Who is going to buy?*

Private business	-	BP Amoco
International Institutions	-	WB Carbon Fund
Governments	-	Switzerland, The Netherlands

*What is the Carbon Fund?*

- Transferring Offsets: to OECD governments/companies
- Originating Offsets: in Eastern Europe/FSU and developing countries
- Benefits: risk diversification/reduction of transaction costs

• *Comments/ Reactions from participants*

- If you have projects such as those in the Phil. Energy Plan which are financially viable you don't even have to go into the flexible mechanisms.
- Emission reduction being an emission right when transferred to another country is a radical concept.
- Golub: Make a cost-benefit analysis so you can decide what policy is appropriate for the Philippines

• *Presentation of Ms. Bernarditas Muller (DFA/ACC): Context of the Climate Change Convention*

- The UNFCCC is a legally binding instrument on climate. Climate change is taking place and there are adverse effects. As early as 1980s, data has been given. As a first step, world climate conference has been conducted.

- There is an accumulation of GHGs in the atmosphere that resulted in concentration. It started during the industrial revolution but it is accumulating now at a faster rate. Reduction of emission will lessen the concentration.
- The objective of the UNFCCC is to stabilize GHG emissions based on the principle of shared but differentiated responsibilities, i.e., developed countries should take the lead towards the reduction and modification of long-term trends in GHG emissions.
- The main commitments taken by the developed countries are provisions of additional financial resources and facilitation of access to appropriate technology.
- Developing countries should plan for sustainable development taking into consideration environment and climate change. Developing countries are most vulnerable to climate change impacts including sea level rise, the El Nino phenomenon, and typhoons.
- Article 12 of the UNFCCC involves developing countries. It involves communication by all parties of the inventory of GHG emissions and steps being taken to implement the Convention.
- The Kyoto Protocol is still being reviewed with respect to the adequacy of commitments. The 1995 review shows that implementation of commitments is inadequate.
- CDM guidelines are still being analyzed, i.e., possible use of CDM projects to be applied to the commitments of the developed countries.
- Emissions trading is not under Kyoto protocol per se. We are still in the process of talking about the issue of additionally.

- Emission reduction measurement and certification are still being discussed. Many things are still under discussion. We are not in a position to determine what mechanism we can use. Issues may not be decided upon in COP 6.
- Comment from Dr. Golub: We encourage the Philippines to take a more active role in the international arena. Try to push your opinions to serve your economic interest.

**D. Ms. Lynn Castro, Participant - Presentation of Next Steps (Mini-Workshop Results)**

Ms. Castro presented the consolidated outputs/recommendations of the three working groups on the next steps which the Philippines can pursue with respect to the Climate Change issue. There were three issues/questions which the participants were asked to address:

*1. Adaptation: what can be done in the short-term and long-term?*

The recommendations on Adaptation are classified into the following categories:

- a) Legal
- b) Institutional
- c) Research/studies
- d) Information, education and campaign, and
- e) Funding/logistics

*2. What position can the Philippines take in the international negotiations?*

The proposed steps were analyzed according to who should be participating in the action plan, government, civil society or both.

*3. Domestic policy for GHG reduction*

The agencies responsible for filling policy gaps and/or implementing existing policies were identified.

- *Discussions/Comments*

- There is no need for a Climate Change Act. There is already a bill filed at the House. We already have the Philippine Clean Air Act. We should concentrate on enforcing the law.

- *Agreements*

- Instead of an EO, ask DILG to issue memorandum order for local government to consider climate change in their local planning.
- Have separate item for vulnerability assessment under adaptation.
- Try to reconstruct the data about the climate in the Philippines thousand years ago. You dig corals from the different parts of the Philippines and study.
- Corrections

- a) Delete "Classification .....accomplishments"
- b) Delete "It could be insisted that the Kyoto .....emissions"
- c) Delete "forest" for carbon sequestration
- d) Replace "reducing" with avoidance
- e) Add "and climate change facility" after low-methane emitting rice
- f) Add "contribute to reduction of poverty"

- The consolidated action plan of the group was revised accordingly and a final version was distributed to the participants after dinner (Appendix D).

### III. Closing Ceremonies

The following gave the closing remarks:

- On behalf of Harvard Institute for International Development (HIID)

**Alexander Golub, Ph.D., *Research Fellow*, Environmental and Natural Resources Program, Harvard University John F. Kennedy School of Government**

I hope you learned something from me because I learned quite a lot from you. I would like to say thank you very much to all of you for your participation in the workshop. I think it was very successful. Unfortunately we tried to accommodate in a four-day program topics and issues that usually take on two or three weeks. That's why we could not accomplish or give you all the answers, but maybe if there's an opportunity for further work, and if you will invite me next time, I would not mind to come to make another one.

Thank you very much.

**Michael McElroy, Ph.D., *Professor*, Department of Planetary Sciences, Harvard University**

I would like to offer just a few remarks. Let me just say that it is pretty clear that we have spent four days dealing with an extremely complex problem. This has very serious implications for many of the countries of the world. I think we all share the conviction that it is important that the Protocol should be ratified, that we should move forward with this very challenging issue. It is not my place to offer any advice for the Philippines nor is it my place to offer any advice for the United States. Speaking as an individual, I consider the comment, in my sense, of this very critical issue from the point of view of how it is going to be handled in the United States. Again I repeat I do not speak for HIID. I do not speak for the United States government. I speak for me. This is going to be a very difficult problem to address in the United States. Within the constraints that are defined by the Kyoto Protocol, for the United States to reduce emission by 7% by 2008-2012 relative to

1990, is a task that would require a reduction of about 10% per year beginning right now. Realistically, that's not going to be done using domestic measures solely. There is a low possibility that in such a very short time scale, the absence of the total collapse of the economy which will not be good for the United States and other trading partners including the Philippines. So how do we deal this? Remember that President Clinton has actually signed the Protocol but has decided not to submit the Protocol to the US Senate because this Senate would not ratify the Protocol. Well, if the Kyoto Protocol is to be ratified by the United States Senate, then currently the only option that exist if the United States is to meet its obligations is to take advantage of the flexibility measures. It is important to understand what these flexibility mechanisms really mean. For the United States what they mean is, the United States will have to transfer financial resources somewhere else in order to meet its commitment. And if it is done solely within the unexploited province, almost certainly that money is going to go to the hot air part of the agreement namely Russia and the Ukraine. Russia and the Ukraine are going to benefit from the very large economic resources that will be transferred simply to come to comply with the world language of the Protocol. And without doing any great benefit to the environment, in my opinion. The Kyoto Protocol is a good first step forward but we need to do a lot more work. Confronted with an extremely complex problem, we have to learn as we go but the conviction provides the opportunity to amend it, make it and to do it the right way. My own sense of how to do this is to define commitment not based on what the emissions are on any particular target year or a couple of years like 2008 and 2012 but to define emissions based on total emissions over a prolonged period of time. I frankly would argue that that period of time needs to be extended, from 2012 right now, perhaps to as far forward as 2030. Countries should then seal commitments to the total emissions for which they have responsibility over the period beginning 1990 to 2030. Why did I pick 2030? If you do pick a realistic target such as 2030, then there's opportunity for countries to make plans to meet the commitments. If we have a realistic time horizon, then we can hope to really redirect resources in a more responsible way. I also would like to say that I think that it is absolutely essential to the success of this process that strong domestic action occurs in countries such as the United States. I don't think the world is going to address this problem in a serious way without an absolutely binding domestic commitment by the United States.

Why did I say that? I say that because if there is such a commitment by the United States and other developed countries, investments in creativity in technology will be made which will develop forms of transportation, forms of power generation and multitude of economic activity which will be less carbon intensive. They will find a market and an application in developing countries. So this is really an opportunity, it seems to me, to a) to protect the global environment, b) to reduce the income disparities between the developing and the developed countries, and c) to really move toward a situation where rich and poor countries are working together to address an issue of common concern. It seems to me that this can be an opportunity for world assembly to work as one. At the same time, there is an absolute need to involve in this process the developing countries. If the developing countries are not involved, there is no way in which the world is going to address this problem in a way that we will be happier. Let us remember the basic facts. The basic facts are that in a very short period of time the developed countries will be a small part of global emissions. In a relatively short period of time, the United States will not be the largest global emitter of CO<sub>2</sub>. China will be a larger emitter of global CO<sub>2</sub>, and a little while after that, Indonesia, Brazil and so on and so forth. The developed countries will be a small part of the total issue here. If we are really going to address the problem and control levels of CO<sub>2</sub> and other greenhouse gases, the developing countries should be involved. The thing is, we are not going to go back to where we are right now at 60 parts per million. If you think a reasonable target might be 500 parts per million, that cannot be done by developed countries alone. Developing countries must be part of the issue. The question is, how can they be involved and how can they be involved in a way that is equitable and allows for development. That's still our chance. One of the big messages, I think, I got from the very interesting discussion that we had today is that there are real opportunities for developing countries in the elements that are defined in this flexibility mechanisms. But if they are to take advantage of these mechanisms, then, baselines must be defined. The real challenge that we have is how to define these baselines. I don't even have enough time to really think about what are the issues that we wish to see as part of the definition of baselines. Is it just simply some blue-sky extrapolation of GDP and current carbon emissions? Surely it should be better than that. Your country and other developing countries have factors that we need to incorporate to come up with what a realistic baseline is. The reason we have the

baseline is that, in that way, you can hope to draw the investments that will be needed to improve your abasement. That's basic. There must be a transfer of economic resources from the rich countries to the poorer developing countries. That must take place. The challenge is to find an equitable way that it could be done and measured in a way that makes sense. I suggest that one criterion that might be built in into the formula to assess the baseline and responsibilities might be to think about the developing countries assuming responsibilities that, in some sense, are tied to the benefits that they gain from international trade. To the extent that the developing country is gaining in a major way from international trade, its responsibility should be correspondingly linked to that. If we can do that, I am not sure we can, I think that it would be a better way.

I also think that this kind of workshop is an absolutely essential input to policy makers. Again, I cannot speak for policy makers here but I can speak for policy makers in the United States. The kind of creative discussion of blue-sky opportunities to do things differently does not, in my country, simply occur in Washington. Nor does it occur simply in a round forum of a climate change issue.

Last night I had a real education. I also learned that a number of you are extremely well skilled at a very peculiar custom, which I had never seen before. You turn on the television set and a peculiar harmony emerges from this television set. Suddenly, people with microphone started making very peculiar songs. Then, they asked me to do the same thing!

Thank you very much.

- **On behalf of the Department of Energy (DOE)**

*Flordeliza Andres, Assistant Secretary, DOE*

Thank you all for your active participation in the workshop. On a personal note, I really appreciate this opportunity to have worked with HIID in facilitating this workshop. I took advantage of this opportunity to be a Teaching Fellow in the workshop because I thought it would be good for my CV. More than that, it turned out to be another opportunity for me to understand more about this climate change debate. I would not know

what Usec. Del Callar would say if he's here but the DOE would like to thank the USAID for the opportunity to co-host this workshop with DENR. Having been here, this workshop has indeed provided a venue for an open and frank discussion of issues related to this climate change despite the uncertainties in the context of the international climate change debate. More so with respect to our own domestic situation, particularly in terms of our own environment. Personally, I am happy and the DOE appreciates the opportunity for having shared with you our energy policy and program. I hope it has enlightened a lot of us and enhanced our understanding of our options for mitigating greenhouse gas emissions with due regard to our sustainable development objectives. Finally, while I have the floor, a question was raised earlier or a remark was made as to whether the Energy Plan seems to have viable projects that we do not need any mechanism to make the projects financially. Well, I guess, to a certain extent it might be true. Given the present plan, I would say, we can do a lot better. It could have improved a lot if there were additional incentives for investors to come here. Like, we can do better with our Renewable Energy Utilization Program. The target or niche for this technology or option is in the rural areas and, as you know, we cannot raise electricity prices in these areas. We have this distribution equity, as Dr. Stavins said, to address. We have some fellow citizens still living in the dark. Twenty-five percent of our barangays still do not have electricity. The only way we can bring these technologies is utilize these resources in those areas, if we can have additional capital to finance them. This is true even with options like natural gas. Perhaps a good example will be this Batangas-Manila natural gas pipeline. We have studied and we have reasons to believe that it might be feasible and there are private investors willing and able to do it. The Japanese government is also very interested in this kind of project. They are offering very cheap money, the Obuchi fund. If we are to really pursue the option of diversifying our energy mix with a cleaner fuel like natural gas, I do not think we can resist this option. This however may run counter to our objective of neutralizing the energy market and getting government out of business. Again, we have to balance all these objectives. I fully respect the position of our counterparts, the members of the IACC. We referred to them with respect to the political nuances of this thrust. We only say from the DOE, from the NPC, and from the technical perspective of that. Yes, we can do better if we have these mechanisms that could allow us to obtain more capital from the private sector, from the

rich countries. Yes we have had problems in our past ventures, with our ITP program. But I could say they had done more good than harm. At the time we made these decisions we were up against more serious problems. Perhaps this should not be a reason for abandoning this option. More so, we should draw our lessons from those experiences. I think we should move on with these initiatives and take the challenge trying to mobilize all the resources that we can get, particularly, human resources. I think we have a lot of them in this room. Perhaps, if there is anything that could come up with this workshop, it is the network of specialists and enthusiastic people who can sustain the momentum. Not only during the discussion of the issues but also in the coordination of the various climate change initiatives, which I found out, are being pursued aggressively by a lot of agencies and companies represented here.

Thank you very much and I hope we see each other again.

- **On behalf of the United States Agency for International Development (USAID)**

**Rosario "Chato" Calderon, *Senior Technical Adviser, Global Climate Change, Office of Environmental Management, USAID***

I would like to share with you the work that went behind the scene to get this workshop going. How did this start? Four months ago, the SOAG committee thought up of putting this workshop as part of the capacity building goals in our recommendation. SOAG refers to Strategic Objective Agreement Grant. This was signed by the Department of Energy in 1996. This project is aimed at reducing emissions from greenhouse gases from the energy sector. There are two committees: the Steering Committee and the Executive Committee. The Steering Committee is headed by the Department of Energy Secretary and has the affiliated energy companies National Power Corporation, Philippine National Oil Company, National Electrification Administration. We also have Energy Regulatory Board, Department of Environment and Natural Resources and National Economic and Development Authority.

I was told that some people were not cognizant that we have been doing a lot of work on climate change. This started in 1996 in the Department of Energy and basically what we focused on was increased use of clean fuels. We've worked on National Gas Policy. Now we are working on the promotion of renewable energy, wind, solar, biogas and others. Our list of achievements include increased energy efficiency and we have worked on the demand side management, heat rate improvement, green building and even green Malacanang soon. At the cross cutting activity we have our capacity building and this workshop falls within this activity. The possibility is something everyone would be interested to be sustainable and not just training to be sustainable. I see this resulting from this workshop. So that's how it happened.

I just want to recognize some of the people that have been working on this for the last three months. One is Hagler Bailly Lou Caluag and her group. From the International Institute of Education Argelie Leynes. From Climate Change Information Center Mon Mendoza. From the National Engineering Center Dr. Aura Matias. And of course, lastly, people from USAID Cat Tatlonghari and Boy Dulce. We've been meeting almost every week just to make sure this works. Also to our Teaching Fellows. I would like to mention, of course, the Professors from the Kennedy School of Government. One thing that they said earlier was that they are here not only to share their experience but also to learn from you. To me that is always important because it is not a one-way stream. It is a two-way stream to be able to appreciate ideas and discussions. In fact, choosing the professors was as important as choosing the participants. And I hope all of you were able to express your thoughts and ideas. It has been said that the best way to make a fool out of yourself is the school because everybody accepts all of your ideas. It is supposed to be the place to make a stand and express things like that, but the final exam is really when you go back to real life. So hopefully when you come out of this, with all the things taught by our professors, remember that they are not telling us the answers but telling us how to achieve the answers. Answers which will help us go through our jobs in policies or other things in project development activities. And lastly, I would like to say that capacity building would bring awareness and awareness, action. It was so nice to see that we are looking at next steps and something that hopefully would be sustainable for a long time. The issue of climate change is very important not just for the Philippines but also for everyone in the

world. And I thought we had fun. USAID always say that it is okay to work but let us have fun. Thank you very much.

- On behalf of the participants

From the Government

**Alice Herrera, Ph.D., *Officer-In-Charge*, Fuels and Energy Division, Industrial Technology Development Institute, Department of Science and Technology (DOST)**

Good afternoon everyone.

Before I give my impressions on the workshop, I would like to thank the organizers for inviting me to participate in this workshop. It has, indeed, been an eye opener for me.

As I have mentioned during the first day, I expected to gain some insights or awareness on the macro level issues on greenhouse emissions and climate change. I think the workshop has addressed these issues and more than that, we have learned some economic aspects of global climate policies and some policy instruments. We learned a lot from the group discussions that we had. I enjoyed a lot in the emissions trading simulation game. We know that this is only a game but in real life, we know that it is quite heartening to see industrial plants shutting down which means that people would be losing their jobs. But of course, if this is inevitable, what could we do.

I have also learned the importance of technology inputs in climate change whether they be in adaptation or in mitigation. Our vulnerability, I think, will be lessened if we have the sufficient technologies. I think the Department of Science and Technology (DOST) where I come from is already addressing issues on climate change. More and more of our researches are being geared towards clean technologies. In fact, one of the flagship programs of DOST which is going to be launched sometime in April, is the Integrated Program on Clean Technologies which aims to promote environment-friendly technologies for agriculture, energy as well as for other sectors.

I wish to thank our professors from Harvard University, Dr. McElroy, Ms. Peterson, Dr. Stavins, and Dr. Golub for imparting their ideas on climate change. I have

the impression that they are real experts from their field and that they enjoy sharing what they know on environmental policies.

Last, but not the least, I would like to congratulate the Secretariat for taking care of the needs of the participants and for working very hard to keep the participants well-informed.

Thank you.

From the Private Sector

**David Tauli, *Senior Vice President and Head, Engineering Services Division, Cagayan Electric Power and Light Company, Inc.***

I will try to reflect what is at the hearts and minds of the participants from the utility companies. We came here with an ignorance which, I would say, very deep as far as climate change is concerned. We know, for example, that there is such a thing as GHQ but not GHG. And emissions trading, to our minds, is when you send your emissions to your neighbor and your neighbor sends their emission to you. Dr. Stavins once stated that environmental economics is a contradiction in terms mainly because that environment that we knew did not understand economics and economics does not care for the environment. So, that's where we came from. That's why when our partners from the government were asking us to take a position and saying that we should press on the Western countries to ratify the Kyoto Convention, we could not really take in a position. We were trying to understand the context in which we were told to take one position or the other. In business, it is not really our role to tell others what to do. We were trying to find out what they would like to do and then we try to enter into transactions that are mutually profitable. So we could not respond to that. Well, after three days, we are now in a position which we think we already understand what is GHG, the other countries' emissions and the like. While Alix Peterson was explaining some of the concepts in environmental economics, I think they were spreading the net too thinly. They were trying to cover, to monetize things like morals. I do not think that if you go for economics, you do not place monetary values

on things like "how beautiful the Grand Canyon is?" At any rate we are aware that there are attempts to factor this in. So we did learn.

It is our first time to enjoy this luxury. And it is really been one of our best times. We thank MERALCO for offering the venue. We thank USAID for enabling us to come here. Lourdes was talking about trying to understand the American mind but what we have found out is that the Filipino mind, in fact, can be identified with people who are of the same mind as we are. For example, in things that we would like to do. So where do we go from here? Again we are here to make commitments on whether or not we accept that climate change is indeed an urgent issue. So we come finally to what Sasha, I think, call the third way. The third way simply means that you make your commitments in trying to reduce greenhouse gas emissions. And in the case of utilities, simply, here is a scenario where you do not do anything. We deliberately try to bring people to cover that fact. It is not telling others what they should do but it is something that you adopt, talk about among your circle of influence and ponder upon. Again network with the people of the same mind. From there hopefully, we can start the ball rolling on this very difficult problem. Thank you very much.

#### From the Academe and Non-Government Organizations

**Fr. Jose Villarin, Manila Observatory, Ateneo de Manila University, Quezon City**

I am supposed to represent the academe but I cannot help representing the Church. Let me just share with you my own reflections. Some of these are deep reflections. I will also represent the civil society. Perhaps our guests here saw how uncivil we can become. I speak for myself not for Cardinal Sin. What was enlightening for me, especially after Dr. Stavins talked, I told myself I need an ulterior change. I was very fascinated with the economics and yet, I have to step back and reflect. That's my nature. I usually find room to reflect. This is just one paradigm. They have come here to give us a gift. A new way of seeing things and we need not attach ourselves by hook line or sinker. But it is a tool. Our tool is the language, which many nations speak together. If we do not or at least try to understand, then we miss a lot. What struck me then as I was reflecting was "is poverty

has had an impact on our environment?" Has wealth too? Too much wealth. Perhaps in this season of lent, if I may, this is a good issue which calls for a lot of conversion. Conversion from our consumerist and materialistic ways. The garden that has been entrusted to us is teaching us a lesson. And that's the value of being able to step back and not to mistake the forest for the trees. I hope that we can always step back and look at the very basis on why we are here in this business of protecting our environment. The Philippine society is a microcosm of what's happening out there. You see a lot of poor people and you see also a few rich. There are areas where the environment is nice and there are also areas where the environment is poor. How do you bring these two sectors or these two groups into a dialogue on a common agenda? That's very difficult. Our poverty had made us a subsistence culture. It is very difficult for us to think long term. It is difficult for us to plot dates because of the exigency of the situation. Therefore the issue of climate would be a long-term struggle. I hope that we will always learn to step back to see beyond the economics, beyond sciences and look what this is all about because it is a transcendental value. We are here. We are passionate of all these things because this is an ethical question. There are transcendental values involved. I think Dr. Stavins did mention that this ecological question could be , "has God created us to have the capacity to destroy this earth, this garden?" I hope not. We have the capacity. We almost destroyed ourselves to oblivion a couple of years back. We also have the freedom and the capacity to be stewards and care for this environment that has been entrusted to us. Then, our lost paradise, we can take back.

Thank you very much.

### **Awarding of Certificates of Completion**

Certificates of Completion were handed to each participant as Dr. Matias called their names individually. They were congratulated by Dr. McElroy, Dr. Golub, and Ms. Calderon. Ms. Peterson gave each participant a HIID key chain as a token souvenir

## 7.0 WORKSHOP EVALUATION: RESULT OF PARTICIPANTS' SURVEY

### I. Introduction

A total of 24 participants out of 38 responded to the *Climate Change Workshop Participant Survey*. The survey aims to evaluate the four-day workshop in terms of a) course content b) the methodology used and c) the usefulness of the materials and handouts provided. It also seeks to elicit comments and recommendations that will be useful in the conduct of future workshop and seminars.

The results of the said survey are presented in the following sections.

### II. Course Content

Table 1 below shows the average rating of the usefulness of the 12 topics presented in the workshop. A rating system from 1 to 5 with "1" being not useful and "5" as extremely useful was used. Results show that all of the subjects were considered "very useful" by the respondents. Lectures on the economics of global climate change policy and the science of global climate change ranked as the two most preferred topics by the participants in terms of usefulness.

*Table 1. Average Rating of Usefulness of Lectures and Topics*

<i>Lectures and Topics</i>	<i>Average Rating</i>	<i>Rank</i>
1. Science of climate change lectures	4.58	2
2. Economics of global climate change policy	4.65	1
3. Economics of technological change	4.42	4
4. Economics of carbon sequestration	4.05	11

<i>Lectures and Topics</i>	<i>Average Rating</i>	<i>Rank</i>
5. Impact of climate change in Philippines presentation	4.48	3
6. GHG forecast presentation	4.21	10
7. GHG mitigation lectures	4.26	7
8. Mini-workshops on action planning	4.42	4
9. Emissions trading simulation game	4.29	6
10. Valuation lectures and discussion	4.30	5
11. International treaties lectures	4.22	9
12. Flexible mechanisms lectures and discussions	4.25	8

The following are the some of the comments on the lectures/topics, discussions, presentation materials and presenters:

- ❖ The lectures really enhanced awareness of all participants about the impact of climate change and defined our role for the mitigating process.
- ❖ Carbon segmentation was not discussed. On forecast presentation, the data should be updated and recent.
- ❖ Lectures were indeed interesting. Presenters were all indeed very good. Topics were only limited. Discussions provided more time on this.
- ❖ The presentation materials would be more understandable if they were written in concise forms (phrases) rather than a facsimile (in bigger fonts) of the handouts.
- ❖ There was too little time for the discussions on the valuation techniques and international treaties. More focus/assistance to Philippine Climate Change concerns suggested.
- ❖ The lecture of Dr. Robert Stavins should have been given ample time. That of McElroy was sufficient though the audio sometimes blurred this, thus optimized listening was not achieved.

- ❖ Lectures were adequate especially that of Prof. R. Stavins. Knowing the programs of the developed countries (i.e. US) on climate change mitigation and its level of compliance to its supposed commitments would have been very useful.
- ❖ I don't think that the following lectures and topics were discussed in its full context and I do not remember them much if they were ever discussed. The lectures of Prof. Stavins were excellent and were very informative.
- ❖ The presenters did an excellent job.
- ❖ Very good! They were all excellent!
- ❖ The lectures were very informative; presenters know their topics very well; they did a good job!
- ❖ Topics were excellent and so were the presenters. Time was not enough to discuss matters extensively.
- ❖ All the professors/lecturers were very skillful in imparting their knowledge and I did learn new things in this workshop.
- ❖ Presenters/speakers were indeed knowledgeable/ accommodating. Topics were sufficiently rigorous. Discussions were lively/fruitful but too many would want to be heard for a short time.
- ❖ Topics were very enlightening and emphasizing the necessity of prioritizing environment-related issues.

### III. Methodology

The survey also provided the participants an opportunity to evaluate the workshop in terms of the treatment of the topics (as to how rigorous the treatment was), the opportunities for class participation and as well as the length or the duration of the workshop. Tables 2, 3 and 4 show that the majority of the respondents considered the treatment of the topics "sufficiently rigorous" and the opportunities for class participation "just sufficient". However, majority of the respondents said that the course length in days should be longer.

*Table 2. Participants' View on the Treatment of Topics*

<i>Treatment of Topics</i>	<i># of respondents</i>
1. Insufficiently rigorous	2
2. Sufficiently rigorous	19
3. Too rigorous	3

*Table 3. Participants' View Regarding Opportunities for Class Participation*

<i>Opportunities for Participation</i>	<i># of respondents</i>
1. Too few	3
2. Just sufficient	17
3. Too many	4

*Table 4. Participants' Comment on the Course Length (number of days)*

<i>Comment on the Course Length</i>	<i># of respondents</i>
1. Should be longer	18
2. Right length	4
3. Too long	2

Listed below are the comments of the participants on the course length.

- ❖ More extensive coverage in terms of time to discuss topics. More in depth evaluation of positions/theories/options/etc.
- ❖ The topics are too broad that more time is necessary to cover all the details.
- ❖ It was too long if the objective was to get recommendations on actions based on the UNFCCC and Kyoto Protocol as this could have been done in about 2 days or less. For introducing climate change and environmental economics, four days would have been sufficient.
- ❖ The topics/discussions need longer time/days.
- ❖ Time was not enough to extensively exhaust the topics, however, a lot of knowledge was relatively gained by the participants.

- ❖ The length of the workshop was just right. The organizers were able to maximize the time.
- ❖ Very important decisions of the future need longer time for deliberation/discussions.
- ❖ We are always in a hurry to finish a topic because of lack of time.
- ❖ The course should be at least 2 weeks.
- ❖ Too many topics such that some were not discussed appropriately.
- ❖ For top management people, 4 days is quite taxing for them.
- ❖ Lectures should have been spread out in more days to allow absorption of information by participants and to accommodate more discussions and question and answer sessions.
- ❖ Environmental economics, as it is, is a full course. Full understanding of this requires case study presentations and hands-on applications. The use of models to simulate actual C-B (cost benefit) analysis would have been very helpful.
- ❖ The economics and valuation portion needs 2 to 3 more days.
- ❖ The topics deserve longer treatment. The workshop day length is just all right.
- ❖ A longer period would have a leveling of the literacy of the participants on climate change. For instance, some participants can not participate in the discussions of the Kyoto Protocol because they are not familiar with it.
- ❖ Should be longer to get more understanding on climate change.
- ❖ As a basic introductory course on climate change, environmental management and development, it is too compressed and too fast.
- ❖ Training like this should not be shortened.
- ❖ Time was not enough for very important topics identified above.
- ❖ Stick to schedule of programs; more time to discuss on all given topics.

#### **IV. Course Materials and Handouts**

Except for two individuals, the rest of the respondents considered the handouts and other materials provided "very helpful" as supplement and complement to the lectures. This finding is presented in Table 5.

*Table 5. Participants' View on the Usefulness of the Materials and Handouts*

<i>Usefulness of Materials and Handouts</i>	<i># of respondents</i>
1. Not very helpful	0
2. Somewhat helpful	2
3. Very helpful	22

The comments on the handouts and materials are as follows:

- ❖ The materials are good source of information and future reference.
- ❖ The presentation of the documents prior to the seminar is indicative that it was perfectly planned. And so with the preparations done to have the Planet Fever on a daily basis.
- ❖ They are prepared by experts in the field. Very good!
- ❖ A lot of materials were distributed and not just on the lectures, but additional ones.
- ❖ Most of the lectures can be retraced back through the handouts. It is good that we have them for our review.
- ❖ These will be good references for future needs.
- ❖ What was not covered in the lectures were clarified/amplified in the handouts and web sites given.
- ❖ The handouts are very helpful but are also mostly too technical and quite inappropriate to the Philippine reality (political and economic maturity).
- ❖ Eye opener. More comprehensive "overview" ; gives context for origin and remedy for climate change; illuminates mechanisms for awareness, formulation, cooperation, implementation of standard operating procedures (SOPs)
- ❖ The materials were very helpful considering it is my first formal attendance in a forum about climate change and development.
- ❖ The information really can be one of our bases for whatever next actions to undertake for the contribution to these global climate concerns and issues.
- ❖ This training is for two weeks , as I know, and we abridged it for 4 days. I have to read all the supplemented documents.

## V. Recommendation for Changes for Future Workshops

The following are the recommendations of the participants for consideration for future conduct of related workshops.

- ❖ A follow up session would definitely reinforce the understanding of the participants on this abridged but very important subjects.
- ❖ Only that more time for mini-workshop/planning for our country should be allocated so that comprehensive inputs from the participants will be discussed more and deliberately be evaluated/qualified.
- ❖ Trainings should be undertaken in the Philippines so that many people can attend than having it abroad.
- ❖ Please include actual video or photo footages of actual happenings on climate change.
- ❖ In addition to environmental economics of climate change, there should be a discussion on the political economy of climate change.
- ❖ Topics of local interest (e.g. carbon sequestration) should have longer coverage. Methodologies to establish or access funding facilities should have been adequately discussed.
- ❖ Less interruptions of lectures from the participants. More workshops. More time.
- ❖ Climate change and the economics of it is a very complex subject. The success of the workshop depends so much on the homogeneity or heterogeneity of the participants as regards their understanding of the topics. Consider examining what the developed countries are doing as regards their compliance to their commitments.
- ❖ Select the participants very, very carefully. Make sure all the participants are of the same level of understanding of the main issue (climate change). Invite more representatives from civic society.
- ❖ The length of time for each topic should be enough for participants to fully grasp/ understand the issues. Longer time please.
- ❖ Lengthen the time and include other related topics on the matter and more experiences of other countries.

- ❖ It would have been better if lectures focused on climate change and its economic implications only. The trading game was a new experience and informative exercise but was not what I expected in a climate change workshop. Discussions on the UNFCCC and the Kyoto Protocol and the other mechanisms should have been kept at a minimum.
- ❖ Philippine issues and other concerns which are not part of the program should have other venue and not this venue.
- ❖ Participants should be clearly informed of the focus of the workshop so as not to stay very far from the prints of the lectures and the goal of the exercise.
- ❖ Organize a workshop on environmental economics (abridged).

Some of the comments are congratulatory in nature while the others are expressing gratitude for the opportunity to be a part of the workshop and learn a lot. Examples of these comments are as follows:

- ❖ Congratulations for a very successful workshop. Let us continue this awareness-raising activity with a strong commitment to do our own share of protecting our earth.
- ❖ I appreciate the efforts exerted by the organizers, particularly the Secretariat. Thanks for the rare opportunity given to me.
- ❖ Secretariat – very helpful and organized.
- ❖ Thanks also for the excellent accommodation and facilitation. More power. Let us go for saving the earth.
- ❖ Great opportunity to be acquired, and intelligently at that, of circumstances leading to the need to mitigate the climate change.
- ❖ Environmental Economics. We come to the realization that most, if not all, of our policies, programs, strategies and actions have not gone through an adequate cost benefit analysis involving externalities as the main issues.

## VI. Synthesis of Evaluation from Participants

The four-day Workshop Forum on Climate Change and Development was, no doubt, a success. Although only about 64% of the participants responded to the survey, the results revealed that majority of the participants learned a lot and is grateful for the opportunity to be a part of the workshop.

From the topics covered, the discussions, the presentations, the handouts and the course materials and the methodology, the general perception among the participants was that the workshop was well organized.

One area that needs improvement is the duration of the course. Most of the participants felt that too much ground was being covered in so little time. The topics presented needed more than the time allotted to allow for their full and in-depth discussions. It is recommended that the seminar be extended to a 5-day program with a daily schedule from 9 a.m. to 5 p.m.

Overall, the four-day workshop enhanced the awareness of the participants on the issues governing the climate change debate. An awareness that the organizers hopes would lead to the implementation of action plan, both locally and on a national level.

## **8.0 APPENDICES**

**A – Letter of Invitation**

**B – List of Invitees**

**C – Press Releases**

**D – Next Steps: Result of Discussions in Mini-Workshop  
Sessions on Climate Change**

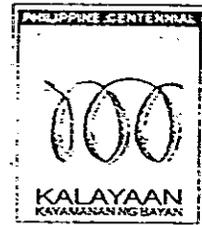
**E – Planet Fever (Issues 1, 2, 3, & 4)**

**F – Workshop Directory**

**APPENDIX A**  
**Letter of Invitation**



Republic of the Philippines  
DEPARTMENT OF ENERGY



MVT-0897-DOE/2400  
March 6, 2000

Ms. Ma. Antonia Fernandez  
Executive Director  
Institute of Climate, Energy and Environment  
Manila Observatory. Ateneo de Manila Campus  
Loyola Heights, Quezon City

Dear Ms. Fernandez:

The Department of Energy (DOE) shall sponsor a four-day (live-in) Workshop on Climate Change and Development on March 27-30, 2000, 8:00 a.m. to 6:00 p.m. at the Manuel M. Lopez Development Center, Sumulong Highway, Antipolo City.

The Workshop is an abridged version of the Executive Program on Climate Change and Development offered by the Harvard Institute for International Development (HIID) in collaboration with the John F. Kennedy School of Government and the Harvard University Committee on the Environment. The Harvard Program is being brought to the Philippines to increase awareness and understanding of global environmental issues and how these relate to economic development and the local environment. It will also be a source of information and ideas that can empower the Philippines to participate more actively and constructively in pursuing both its own development and global climate change. The Workshop will be conducted by climate change experts from the Harvard Institute on International Development (HIID) Program on Climate Change and Development. They are: *Dr. Robert Stavins*, the Albert Pratt Professor of Business and Government, and Faculty Chair of the Environment and Natural Resources Program at the John F. Kennedy School of Government, Harvard University; *Dr. Michael McElroy*, Chair, University of Committee on Environment, Harvard University and Chair, Department of Earth and Planetary Science, Harvard University; *Dr. Alexander Golub*, an Associate of the HIID and one of its leading experts on climate change issues; and *Dr. Randall Bluffstone*, a former Associate at the HIID and a Professor of Economics at the University of Redlands in California. Attached is the Workshop outline.

The Workshop has been designed to provide the participants with an understanding of the key issues of global climate change and their implications for economic development. More specifically, the Workshop will (1) identify the gaps in understanding global environmental issues as these relate to economic development; (2) empower the participants to participate more actively and constructively in global climate change concerns; and (3) analyze private and public sector innovations and initiatives to address climate change. This activity is supported by the USAID because of its importance in the restructuring of the electric industry.

Recd. by *[Signature]*  
3-15-00

To maximize interactive discussions during the Workshop, we suggest that the participants have the background knowledge on and involvement in climate change and development activities.

We have considered you to be among the Workshop participants. We request you to submit to us a letter of application to the workshop, a latest copy of your biodata, a brief write-up of the workshop's expectations, and a plan of action to address climate change issue(s) in the Philippines, either at your office/agency level or on a national level.

We request your confirmation of participation to this Workshop by signing in the space provided below and fax back to us not later than March 21, 2000.

We advise you to coordinate with the Workshop Secretariat for detailed registration information and workshop mechanics through:

Ms. Lou Caluag and/or Ms. Laura Mateo

Telephone No.: 751 - 9422

Fax No.: 751 - 9420

E-mail Addresses: [loucaluag@pccmp.com.ph](mailto:loucaluag@pccmp.com.ph) ; [lpmateo@pccmp.com.ph](mailto:lpmateo@pccmp.com.ph)

Very truly yours,

  
Mario V. Tiaoqui  
Secretary

Attachment

---

To : HIID Workshop Secretariat  
Fax No. 751-9420

\_\_\_\_\_ I hereby approve the participation of above-mentioned staff /confirm my participation to the Climate Change and Development Workshop.

SGD.: \_\_\_\_\_

## APPENDIX B

### List of Invitees

#### GOVERNMENT

INVITEES	PARTICIPANTS
<p><b>Dept. of Energy</b> Energy Center, Meritt Road Fort Bonifacio, Taguig T 8441021</p> <p><i>Mr. Cyril del Callar</i> Undersecretary</p>	<p><i>Mr. Francisco A. Benito</i> Acting Director Energy Utilization Management Bureau</p> <p><i>Mr. Desiderio A. Fuerte, Jr.</i> Supervising Science Research Specialist Environmental Protection and Monitoring Division</p> <p><i>Mr. Emmanuel Talag</i> Senior Science Research Specialist Energy Planning and Monitoring Bureau</p>
<p><b>Department of Environment &amp; Natural Resources</b> Visayas Ave., Diliman, QC Fax No. 920-0374/Tel. No. 920-0374</p> <p><i>Mr. Mario S. Roño</i> Undersecretary for International Environmental Affairs and Local Government</p> <p><i>Ms. Amelia Dulce Supetran</i> <i>Ms. Joyceline Goco</i> T 9202251</p> <p><i>Ms. Wilma Sabado</i> Forest Management Bureau T 9277372</p>	<p><i>Ms. Wilma Sabado</i> Attorney II, Legal Division Forest Management Bureau</p>
<p><b>Department of Foreign Affairs</b></p> <p><i>Ms. Bernarditas Muller</i> Director Tel. No. 831-3192/Fax No. 833-1322</p>	<p><i>Ms. Bernarditas Muller</i> Director, Division II Office of United Nations and International Organizations</p>

INVITEES	PARTICIPANTS
<p><b>Department of Health</b> Sta. Cruz, Manila</p> <p><i>Dr. Mario Baquilod</i> Chief, Environmental Services Tel. 7438301 loc. 2500</p> <p><i>Ms. Agnette Peralta</i> Director, Radiation Health Office Telefax 7116016</p>	<p><i>Dr. Cristina Galang</i> Medical Specialist II Environmental Health Service</p>
<p><b>Department of Public Works and Highways</b> Bonifacio Drive, Port Area, Manila Telefax 5274811 Tel 5278921 loc. 415/287</p> <p><i>Undersecretary Teodoro Encarnacion</i></p> <p><i>Ms. Criste Z. Navida</i> Project Manager 1 Environmental Impact Assessment Project Office</p>	<p><i>Mr. Francisco A. Kalalo, Jr.</i> Engineer III, Environmental Impact Assessment Project Office</p> <p><i>Mr. Jesse C. Felizardo</i> Civil Engineer Environmental Impact Assessment Project Office</p>
<p><b>Dept. of Science and Technology</b></p> <p><i>Dr. Alice B. Herrera</i> OIC, Fuels &amp; Energy Division Industrial Technology Development Institute Bicutan, Taguig, Metro Manila Tel. 837-2071 loc. 2190 Fax 837-3167</p> <p><i>Dr. Rosa Perez</i> <i>Dr. Aida Jose</i> <i>Ms. Lourdes Tibig</i> Philippine Atmospheric Geophysical &amp; Astronomical Services Administration (PAGASA) T 3733434/29; F 3733434</p>	<p><i>Dr. Alice B. Herrera</i> OIC, Fuels &amp; Energy Division</p> <p><i>Ms. Lourdes Tibig</i> Chief, Climate Data Section Climatology &amp; Agrometreology Branch PAGASA</p>
INVITEES	PARTICIPANTS

INVITEES	PARTICIPANTS
<p><b>Department of Trade &amp; Industry</b> Sen. Gil Puyat Ave. Ext. Makati City</p> <p><i>Mr. Raul Angeles</i> T 8956617; F 8953997</p>	<p><i>Mr. Guillermo S. Laquindanum</i> Division Chief, Basic Industries Department Officer-In-Charge, Environmental Unit, Board of Investments <a href="mailto:eu@boi.gov.ph">eu@boi.gov.ph</a></p>
<p><b>Dept. of Transportation &amp; Communication</b> Transport Planning Services 6<sup>th</sup> Floor Columbia Tower Ortigas Ave., Mandaluyong City Tel. No. 727-1703</p> <p><i>Ms. Melanita Malvar</i> Tel 7277956</p>	<p><i>Ms. Corazon Japson</i> Supervising Transportation Development Officer <a href="mailto:corajap@yahoo.com">corajap@yahoo.com</a></p>
<p><b>Energy Regulatory Board</b> Pacific Center Bldg. San Miguel Avenue Ortigas Center, Pasig City</p> <p><i>Ms. Florentina Robles</i> Director II Tel 6348641; F 6315871</p> <p><i>Atty. Thomas T. Que, Jr.</i> Executive Assistant to the Chairman T 6334556; F 6315871</p>	<p><i>Ms. Florentina Robles</i> Director II</p> <p><i>Atty. Thomas T. Que, Jr.</i> Executive Assistant to the Chairman</p>
<p><b>National Electrification Administration</b> NIA Road, Quezon City</p> <p><i>Dr. Jocelyn Capule</i> Technical Assistant to the Administrator T (0918) 8424232</p> <p><i>Ms. Estrella Batalla</i></p>	<p><i>Dr. Jocelyn Capule</i> Technical Assistant to the Administrator</p>
<p><b>Office of Hon. Congressman Heherson Alvarez</b> Rm. 1203 Gotesco Twin Towers Concepcion Street, Ermita, Manila Telefax 9315369 Fax No. 527-8713</p>	<p><i>Mr. Roger Birosel</i> Earthsavers Movement</p> <p><i>Ms. Liwayway L. Memije-Cruz</i> Instructor III, Natural Science Polytechnic University of the Philippines Sta. Mesa, Manila T 7167832 - 45; F 7161143</p>

INVITEES	PARTICIPANTS
<p><b>Technology Livelihood Resource Center</b>                      Environmental Management Program Office                      10<sup>th</sup> Floor City State Center Bldg.                      709 Shaw Blvd., Pasig City</p> <p><i>Mr. Tito Fortes</i>                      Program Manager                      T 6374104; Fax No. 633-5703</p>	<p><i>Mr. Tito Fortes</i>                      Program Manager</p>
<p><b>National Power Corporation</b>                      Agham Road, Quezon City                      Tel 9224339; 9213541 – 80                      Fax 9212468; 9245464</p> <p><i>Ms. Resurreccion Petel</i>                      Manager, Environmental Management                      Department</p> <p><i>Ms. Humbelina Castro</i>                      Manager, Environmental Impact Assessment                      Division</p> <p><i>Ms. Eva Malilay</i>                      Chief Corplan Specialist, Socio-                      Environmental Division, RUPD-Corplan</p> <p><i>Ms. Josephine Mangila</i>                      Tel 9245246</p>	<p><i>Ms. Resurreccion Petel</i>                      Manager, Environmental Management                      Department</p> <p><i>Ms. Humbelina Castro</i>                      Manager, Environmental Impact                      Assessment Division</p> <p><i>Mr. Rufino G. Villafuerte</i>                      Chief, Customer Relations                      Public Affairs Department</p>
<p><b>Office of Hon. Senator Robert Jaworski</b>                      Chairman, Committee on Environment                      Senate of the Philippines                      Pasay City</p> <p><i>Mr. Lito David</i>                      Head Executive Assistant                      Tel. 522-6601 loc. 3305                      Fax No. 551-3746/5526776</p>	
<p><b>Department of Agriculture</b>                      Room 209, Elliptical Road, Diliman, Quezon                      City</p> <p><i>Ms. Tetchie Capellan</i>                      Assistant Secretary                      Telefax 9201407; 9200928</p>	

INVITEES	PARTICIPANTS
<p><b>National Economic &amp; Development Authority</b>                      Amber Avenue, Ortigas Center                      Pasig City</p> <p><i>Mr. Felizardo K. Vertucio</i>                      Tel. 6313714; 6313745</p> <p><i>Ms. Violeta Conde</i>                      Tel 6310945; Fax 6313734</p>	
<p><b>Phil. National Oil Company (PNOC)</b>                      Energy Center                      Merritt Road, Fort Bonifacio                      Taguig, Metro Manila</p> <p><i>Ms. Nieves Osorio</i>                      Executive Vice President                      Tel. 8442983</p>	
<p><b>PNOC – Energy Development Corporation</b>                      Merritt Road, Fort Bonifacio                      Taguig, Metro Manila</p> <p><i>Ms. Agnes de Jesus</i>                      Manager, Environmental Management Division                      Tel. 844 – 8762; Fax. 844 – 6343</p>	
<p><b>League of Municipalities of the Philippines</b>                      N. Domingo Street, San Juan, Metro Manila</p> <p><i>Mayor Jinggoy Estrada</i>                      Tel 7242603; 7244736                      Fax 7268556</p>	
<p><b>League of Provinces of the Philippines</b>                      Provincial Capitol, Sta. Cruz, Laguna</p> <p><i>Gov. Jose Lina, Jr.</i>                      President                      Tel (049)8081103                      Fax (049)8081016                      Tel 7181812 c/o Sandra Paredes                      Fax 7171810</p>	

INVITEES	PARTICIPANTS
<p><b>Development Bank of the Philippines</b></p> <p><i>Mr. Marietto Enecio</i> Vice President Head, Industrial Restructuring and Research Tel 8189611 Fax 8151517</p>	
<p><b>Land Bank of the Philippines</b> 7<sup>th</sup> Floor, Land Bank Building # 4, 313 Sen. Gil Puyat Avenue, Makati City</p> <p><i>Mr. Moreno Peñalba</i> Head, Environmental Unit Tel 8189411 loc. 2364; 8445267 Fax 8174619</p>	

**PRIVATE UTILITY**

INVITEES	PARTICIPANTS
<p><b>Davao Light &amp; Power Co., Inc.</b> Tel (082) 2253205</p> <p><i>Mr. Philip Moleno</i></p>	<p><i>Mr. Ruel Acacio</i> Mechanical Maintenance Supervisor/Pollution Control Officer Bajada Power Plant</p>
<p><b>Manila Electric Company (MERALCO)</b> Ortigas Centre, Pasig City Tel. No. 1622-8225/Fax No. 1622-8672</p> <p><i>Mr. Fortunato Leynes</i> Senior Manager &amp; Head Energy Management Tel 6311168, 16228646; F 16228554</p> <p><i>Mr Rodolfo Quetua</i> Tel 16223057; 6315665</p>	<p><i>Mr. Fortunato Leynes</i> Senior Manager &amp; Head Energy Management</p> <p><i>Mr. Ciprinilo C. Meneses</i> Head, Integrated Resource Planning Utility Economics Division T 6328572; F 6315665</p>
<p><i>Mr. Ralph Casiño</i> President <b>Iligan Light &amp; Power, Inc.</b> Borther Jeffrey Road, Palao Iligan City Tel. (063) 221-4900 to 02 / 221-5707 to 09 Fax (063) 517-173</p>	<p><i>Mr. Avelino L. Quiamco</i> Engineering Specialist</p>

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INVITEES	PARTICIPANTS
<p>Mr. Ramon Abaya President Cagayan Electric Power and Light Co., Inc. (CEPALCO) 8/F Strata 100 Bldg. Emerald Avenue, Ortigas Center Pasig City</p>	<p><i>Mr. David A. Tauli</i> Sr. Vice Pres. Head, Engineering Services Division T (63-8822)722372, 725550 F (63-8822) 726019, 723775</p>

**ACADEME**

INVITEES	PARTICIPANTS
<p>University of the Philippines Diliman, Quezon City 9205301</p> <p><i>Prof. Edgardo G. Atanacio</i> Dean, College of Engineering</p> <p><i>Dr. Danilo Yanga</i> Dean, College of Science T 9205301 loc. 7174; F 9247674</p>	<p><i>Prof. Edgardo G. Atanacio</i> Dean, College of Engineering</p>
<p>University of Asia &amp; the Pacific Pearl Drive, Ortigas Center Pasig City</p> <p><i>Ms. Theta C. Ponce</i> Institute for Environment and the Sciences Tel 6342804/05, Fax 6342816</p>	<p><i>Ms. Theta C. Ponce</i> Institute for Environment and the Sciences</p>

**PRIVATE/PROFESSIONAL ORGANIZATION**

INVITEES	PARTICIPANTS
<p><b>Manila Observatory</b> Ateneo de Manila Campus Loyola Heights, Quezon City</p> <p><i>Fr. Jose Villarin</i> Tel 4266141</p>	<p><i>Fr. Jose Villarin</i></p>
<p><b>Mr. Zoilo Cortez</b> President <b>Philippine Electric Plant Owners Association (PEPOA)</b> 8/F Strata 100 Bldg. Emerald Avenue, Ortigas Center, Pasig City</p>	<p><i>Engr. Oscar T. Rodriguez</i> Assistant Chief, Economic Analysis/Planning Staff Head, Power Marketing and Sales Department Visayan Electric Co., Inc. T (032) 2557511 loc. 237 F (032) 2539921</p>
<p><b>Philippine Climate Change Information Center</b> Manila Observatory, Ateneo de Manila Campus, Katipunan Avenue, Loyola Heights, Quezon City</p> <p><i>Mr. Ramon Mendoza</i> T 4265921 – 23; F 4266141 Telefax 4260837</p>	<p><i>Mr. Ramon Mendoza</i></p>
<p><b>Phil. Pollution Prevention Roundtable</b> 40 Doña Justina Street Filinvest South Biñan, Laguna</p> <p><i>Mr. Wilfrido F. Nava</i> Vice President Tel/Fax 699-2070</p>	<p><i>Mr. Wilfrido F. Nava</i> Vice President</p>
<p><b>Management Association of the Philippines</b> 2/F AIM ACCEED Conference Center Ayala Corporation Hall Trasierra cor. Benavides Street, Legaspi Village, Makati City</p> <p><i>Dr. Corazon Pe Benito Claudio</i> Chair, Committee on Environment Tel. 751-1149 to 52 Fax 751-1154</p>	

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INVITEES	PARTICIPANTS
<p>Atty. Miguel B. Varela  <b>Philippine Chamber of Commerce &amp; Industry</b>                      Tel 8338591                      Fax 8338895</p>	
<p><b>Sibol ng Agham at Teknolohiya (SIBAT)</b>                      10 Alley 13, Road 3, Project 6, Quezon City</p> <p><i>Ms. Victoria M. Lopez</i>                      Executive Director                      Tel 9291140                      Telefax 9293220  <a href="mailto:sibat@info.com.ph">sibat@info.com.ph</a></p>	

**US AGENCIES**

INVITEES	PARTICIPANTS
<p><b>US Embassy</b></p> <p><i>Ms. Lauren W. Catipon</i>                      Environment, Science and Technology Affairs, Economic Section                      T 523 – 1001 loc. 2332; F 338 - 4127</p>	<p><i>Ms. Lauren W. Catipon</i>                      Environment, Science and Technology Affairs, Economic Section</p>
<p><b>United States Agency for International Development (USAID)</b>                      17<sup>th</sup> Floor, Ramon Magsaysay Center                      1680 Roxas Blvd., 1004 Malate, Metro Manila</p>	<p><i>Ms. Lina Jensen</i>                      T 5224411 loc. 3908; F 5222512</p> <p><i>Ms. Fatima Verzosa</i>                      Project Development Specialist/WID Officer, Programs and Resources Management                      T 5224411 loc. 3786</p>

**NON-GOVERNMENT ORGANIZATION**

INVITEES	PARTICIPANTS
<p><b>Institute of Climate, Energy &amp; Environment</b>                      Manila Observatory                      Ateneo de Manila Campus,                      Loyola Heights, Quezon City</p> <p><i>Ms. Ma. Antonia Fernandez</i>                      Executive Director                      T4265921/23 loc. 114/115; F 426-6493</p>	<p><i>Ms. Ma. Antonia Fernandez</i>                      Executive Director</p>
<p><b>Phil. Network on Climate Change</b>                      C/O Green Forum                      14 Mabait Street, Teachers' Village,                      Diliman, Quezon City</p> <p><i>Mr. Sam Ferrer</i>                      Convenor                      T 928-4397; F No. 925-3739</p>	<p><i>Mr. Sam Ferrer</i>                      Convenor</p>
<p><b>Foundation for Philippine Environment</b>                      # 7 Matahimik Street, Teachers' Village,                      Diliman, Quezon City                      T 9272186; 9279403; 9269629                      F 9223022</p>	<p><i>Ms. Joy Galvez</i>                      Executive Assistant, Executive Office</p>

**APPENDIX C**  
**Press Releases**

# THE PHILIPPINE STAR

**TRUTH SHALL PREVAIL**

<http://www.philstar.com>

e-mail: [philstar@pacific.net.ph](mailto:philstar@pacific.net.ph)

SUNDAY, MARCH 26, 2000

C-5

## Climate change development workshop slated

The Department of Energy (DOE) through its Philippine Climate Change Mitigation Program, a USAID-assisted activity, will hold a four-day "Climate Change and Development Workshop" on March 27-30, at the Manuel Lopez Development Center in Antipolo.

Leaders and advocates from multi-sectoral groups championing the cause of global climate change won't have to go to Harvard to hear the updates on this topic of worldwide impact and magnitude. Distinguished climate change experts from the Harvard Institute for International Development (HIID) led by Dr. Michael McElroy, a climate change adviser to US Vice President Al Gore, will be here. He is best known for his analyses of anthropogenic changes in the atmosphere, with an emphasis of how these changes affect climate, degrade air quality, and alter the amount of solar radiation reaching the Earth.

This workshop is an abridged version of the Executive Program on Climate Change and Development offered by HIID in collaboration with

the John F. Kennedy School of Government and the Harvard University Committee on the Environment.

Another forum lecturer is Robert Stavins, the Albert Pratt Professor of Business and Government, and faculty chair of the Environment and Natural Resources Program at the John F. Kennedy School of Government, Harvard University.

The relevance of this workshop cannot be over-emphasized as it intends to heighten the awareness and understanding of global environmental issues that directly affect the economic development and local environment of the Philippines, as it coincides, too with the observance of the International Earth Day and International Earth Week celebration in April.

• M • E • T • R • O •

Editor: ARTHUR GALLEG0

## DOE sets four-day workshop

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Leaders and advocates from multi-sectoral groups championing the cause of global climate change won't have to go to Harvard to hear the updates on this topic of worldwide impact and magnitude. Distinguished climate change experts from the Harvard Institute for International Development (HIID) led by Dr. Michael McElroy, a climate change advisor to US vice president Al Gore, will be here. He is best known for his analyses of anthropogenic changes in the atmosphere, with an emphasis of how these changes affect climate, degrade air quality, and alter the amount of solar radiation reaching the Earth.

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B-10

**MANILA BULLETIN**  
THE NATION'S LEADING NEWSPAPER

## GREENLAND ICE YIELDS CLIMATE CHANGE CLUES



United States Geological Survey (USGS) geophysicist Gary Clow used high-precision equipment to measure small temperature variations within the Greenland Ice Sheet resulting from past climatic changes.

Using instruments developed at the USGS, scientists have for the first time accurately determined how much temperatures have changed at a Northern Hemisphere site in central Greenland during the last 50,000 years, through the end of the last ice age.

Previous studies using plant pollens stored in lake sediments, chemical isotope ratios stored in glaciers and various other climate indicators, have shown that past climates have been both warmer and colder than the present.

The new study, reveals how much warmer and colder these previous climate changes were. Temperatures during the Little Ice Age (1420 to 1890 AD) were found to be 2 degrees Fahrenheit colder than present in central Greenland. In contrast, temperatures were 2 F warmer than present during the Medieval Warm Period, 1,000 years ago when the Vikings established settlements in Greenland, and 5000 years ago were 4.5 F warmer. The last ice age, about 22,000 years ago, was found to be extremely cold with temperatures dipping to 41 F below current values.

These measurements were made in a 10,000-foot access

hole drilled through the ice sheet by the European Science Foundation, using equipment that can measure temperature to within 0.0004 F. With these data, researchers from the University of Copenhagen, Denmark, and the USGS reconstructed the record of past temperature (climate) changes.

As part of the current debate on global warming, it is essential to establish both the magnitude and time scales for natural climate variability for the Earth as a whole and for several key regions, according to USGS scientists.

The region surrounding the North Atlantic Ocean appears to be particularly sensitive to climatic changes because of changes in the ocean circulation patterns that bring warm surface waters from the tropics into the North Atlantic, Clow noted.

Studies such as this provide critical information about natural climate variability that is needed to determine whether the global climate warming observed during the 20th century is due to increased concentrations of greenhouse gases caused by human activities or can be attributed to natural climate variations.

## APPENDIX D

### Next Steps: Result of Discussions in Mini-workshop Sessions on Climate Change

#### I. Adaptation

Identified steps were classified into categories depending on the nature of the action.

<b>Legal</b>	<ul style="list-style-type: none"> <li>• Memorandum Order on Climate Change</li> </ul>
<b>Institutional</b>	<ul style="list-style-type: none"> <li>• Identification of the IACCC to spearhead IEC activities</li> <li>• Tap concerned agencies (national government, NGOs, LGUs, etc.) to ensure 100% (nationwide) coverage of the IEC</li> <li>• Identification of the Leagues (of Municipalities, Cities, etc.) as implementors of projects</li> <li>• Set-up monitoring body/group that will evaluate projects (feasibility, implementation and effectivity)</li> <li>• Coordinating mechanisms among concerned agencies</li> </ul>
<b>Research/Studies</b>	<ul style="list-style-type: none"> <li>• Build baseline information for monitoring geogenic and anthropogenic climate change effects</li> <li>• Study factors complicating climate change effects assessment such as subsidence due to groundwater extraction versus rising sea level</li> <li>• Identify projects that could be implemented</li> <li>• Conduct Vulnerability Assessment to climate change (priority give to critical sites/ sectors)</li> <li>• Conduct Adaptation studies to climate change</li> <li>• Local Action Planning (LAP) model for response vulnerability</li> <li>• Use El Niño phenomena as jump off point for action</li> <li>• Gather historical meteorological data for Philippines to the extent practicable (e.g., cores of coral)</li> <li>• Strengthen monitoring function of CCIC</li> </ul>
<b>Information, Education and Communication (IEC)</b>	<ul style="list-style-type: none"> <li>• Use of the experiences in Pangasinan, the 5 cities and other provinces as models for IEC</li> <li>• Information dissemination on vulnerability and response to climate change</li> <li>• Information dissemination through conference fora and printed materials</li> <li>• Advocacy seminars on energy efficiency and safety, power patrol and transport patrol</li> </ul>
<b>Funding/Logistics</b>	<ul style="list-style-type: none"> <li>• Get resources/necessary funding</li> <li>• Determine funding sources and mechanisms</li> </ul>

## II. Country's Role in the International Arena

	Government	Civil Society
Continue participation in the development of mechanisms and institutions for the eventual entry into force of the Kyoto protocol taking into consideration equity, transparency, and efficiency...		
Lead by example: thru legislation, IEC, and minimization of GHG emissions		
Aim for sustainable development: for equitable distribution of resources and opportunities		
Strongly advocate the immediate ratification of the Kyoto Protocol by all Annex I countries.		
Long-term involvement of the Philippines in international climate change for a		
International advocacy role on the adverse effects of climate change, together with similarly situated islands/climate change vulnerable countries		
Undertake examination of potential for carbon sequestration (using forests and other means)		
Develop projects and programs for avoiding emissions using leverage from developed countries		
Develop climate change investment facility to create project pipeline		
Develop country strategy on climate change to consider GHG reduction and avoidance		
Undertake climate change actions consistent with the principle that the Philippines participation in climate change initiatives is predicated on the expectation that the goal of poverty reduction will be furthered. This is in recognition of the fact that the adverse effects of climate change contribute to poverty in the Philippines.		
Participate in international audits to determine compliance with climate change obligations by developed countries		

### III. Emission Reduction/Avoidance

Specific agencies and/or organizations, both government and private, that would play significant roles in the carrying out the actions/steps to reduce/avoid emissions were identified.

	<b>Agency/Organization</b>
Development and use of an efficient mass transport system	Department of Transportation and Communication (DOTC)
Use of compressed natural gas	Department of Energy (DOE), Department of Science and Technology (DOST), DOST
Political will - phase out of jeepneys and tricycles- contingent on the availability of alternative public transportation	DOTC, LGUs
Philippine Clean Air Act Implementation	Department of Environment and Natural Resources (DENR), DOE, DOTC
Regulation/incentives to encourage development and use of renewable energy sources	DOE, Department of Trade and Industry (DTI), Board of Investments (BOI), Congress
Research on low methane-emitting rice varieties and low methane emitting waste water treatment facilities; address contribution of agriculture	Department of Agriculture (DA), International Rice Research Institute (IRRI), DOST, Philrice
IEC to increase public awareness	Philippine Information Agency (PIA), Department of Education, Culture and Sports (DECS), Inter-Agency Committee on Climate Change (IACCC), DOE and attached agencies
Quantify costs of climate change actions versus "business as usual" scenario for possible funding	IACCC
Develop new and renewable energy (NRE), and clean and indigenous power projects	DOE, DOST
Energy efficiency	DOE, PCIERD, ERB
Promotion of mass transport, non-motorized and energy efficient modes of transportation	DOST, DOE, DOTC

**APPENDIX E**  
**Planet Fever (Issues 1, 2, 3, & 4)**



## Executive Breakfast Forum held at EDSA Shangri-La Hotel

The Department of Energy (DOE) and the Department of Environment & Natural Resources (DENR) jointly sponsored an executive breakfast forum on the theme, "Facing the Challenges of Climate Change" this morning at the EDSA Shangri-La Hotel. Experts from the Harvard Institute for International Development (HIID), Dr. Michael McElroy and Dr. Robert Stavins discussed key issues and policy directions to address climate change.

Dr. McElroy, a climate change advisor to US Vice President Al Gore, is a renowned specialist on climate change issues and is credited with identifying the mechanism that is responsible for loss of ozone over the Antarctica. Dr. Stavins is an expert on diverse areas of environmental economics and policy.



*Dr. Michael McElroy addressing the guests at the Executive Breakfast Forum at EDSA Shangri-La Hotel, March 27, 2000*

Secretary Mario Tiaoqui of the Department of Energy welcomed the guests led by Secretary Felipe Medalla of the National Economic Development Authority, Secretary Alfredo Lim of the Department of Interior and Local Government, US Ambassador to the Philippines, Ambassador Thomas Hubbard and Ms. Patricia Buckles, Mission Director of the USAID Philippines. The forum was also attended by members of the House of Representatives, Cong. Heherson Alvarez, Cong. Neric Acosta, Cong. Florencio Abad and Cong. Vicente Sandoval. They were also joined by top executives from the Power Generation and Distribution Sector, Academic and NGOs.

The forum is a kick off activity to the four-day "Climate Change & Development Workshop" on March 27-30, at the Manuel M. Lopez Development Center in Antipolo. Leaders and advocates from multi-sectoral groups championing the cause of climate change will hear distinguished climate change experts from the HIID. The workshop is an abridged version of the executive program offered by HIID in collaboration with the John F. Kennedy School of Government and the Harvard University Committee on the Environment.



*Dr. Robert Stavins discussing the economics of climate change*

# Participant Expectations



## We got the fever

- "Obtain knowledge and understanding that can be used in the development and implementation of energy-efficiency projects and renewable sources of energy, particularly with respect to their impact on climate change."
- "The workshop should give me an insight in addressing environmental issues/concerns for a sustainable development."
- "To understand how emissions affects Iligan Light and Power, Inc.'s barangay electrification projects. What is the impact to the environment in relation with our initial study on portable diesel generator."
- "To have a better understanding of the dynamics governing the discussion of issues in climate change and the developing countries' perspective. This should be beneficial to the understanding of climate change for the Philippines."
- "To have a deeper understanding of the Climate Change issue, its impact on the health, economic, social, political, biodiversity status of the country and how it can be better and more effectively addressed."
- "To learn new information on the science and impacts of climate change as well as new developments in the combat against these problems. I expect to interact with the other participants, share views and experiences on how we have addressed or plan to address the issue of global warming."

A new analysis by government scientists indicates that the planet's climate is warming at an unprecedented rate, suggesting that the future impact of global warming may be more sudden than previously predicted. The study, which will be published in the March 1 issue of the Journal Geophysical Research Letters, found that the very high temperatures during 1997 and 1998 likely mark a "change point" at which the planet's surface began to heat up faster than it had in previous decades. Study leader Tom Karl of the National Oceanic and Atmospheric Administration said the current pace of temperature rise is consistent with a rate of 5.4 to 6.3 degrees Fahrenheit per century. In contrast, the average rate of warming from 1900 to 1997 was about 1.1 degrees.

Source: Los Angeles Times, 02.23.00,  
Usha Lee McFarling



Issue 2

28 March 2000



"Climate Change in the New Millennium: The Philippine Scenario" (Courtesy of the Philippine Climate Change Information Center)

## Harvard Professors conduct Climate Change and Development Workshop

The Department of Energy (DOE) through its Philippine Climate Change Mitigation Program, a USAID-assisted activity, brought together thirty-eight (38) leaders representing the different government institutions, non-government organizations, industry and the academe to a four-day "Climate Change and Development Workshop" from March 27 to 30, 2000 at the Manuel M. Lopez Development Center in Antipolo.

The workshop is being brought to the Philippines by the Harvard Institute of Institutional Development (HIID) led by Dr. Michael McElroy. This activity is intended to heighten the awareness and understanding of global environmental issues and how these relate to economic development and the local environment. More importantly, the workshop is aimed to be a source of information and ideas that can empower the Philippines to participate more actively in pursuing both its own development and its efforts to address global climate change.

The holding of the workshop is considered significant and timely for the observance of the International Earth Day and the International Earth Week Celebration in April.

## They couldn't be careless

A community of residents in Freiburg, Germany has launched the nation's biggest experiment in car-free living. The Vauban development - which includes 280 new homes on 94 acres - bans cars within its limits, so people happily get around by bike and on foot. About half of the residents have given up their cars completely, while the others keep vehicles in garage just outside the development. Vauban resident Ruthild Haage-Rapp: "The children can play in the street. It's quiet. You can stand by your kitchen window without all the noise from the street. Then the inconvenience is worth it."

Germany has some 20 car-free communities in various stages of development, and the trend is spreading to other European nations. An auto-free development in Amsterdam with 600 apartments was completed in 1998, a similar project opened in Vienna in December, and another will be completed in Edinburgh this summer.

Source: South Africa Independent,  
Associated Press, 03.10.00

# Participants' Profile

## Government

- 4 Department of Energy
- 1 Department of Environment and Natural Resources
- 1 Department of Health
- 2 Department of Public Works and Highways
- 2 Department of Science and Technology
- 1 Department of Trade and Industry
- 1 Department of Transportation and Communication
- 2 Energy Regulatory Board
- 1 National Electrification Administration
- 3 National Power Corporation
- 1 Off. of Cong. Alvarez
- 1 Technological and Livelihood Research Center

## Private Utility

- 1 Davao Light and Power
- 2 MERALCO
- 1 Iligan Light and Power
- 1 Cagayan Light and Power

## Academe

- 1 University of the Philippines
- 1 Polytechnic University of the Philippines
- 1 University of Asia and the Pacific

## Private/Professional Organization

- 1 Manila Observatory
- 1 PEPOA
- 1 Philippine Climate Change Information Center
- 1 Philippine Pollution Prevention Roundtable

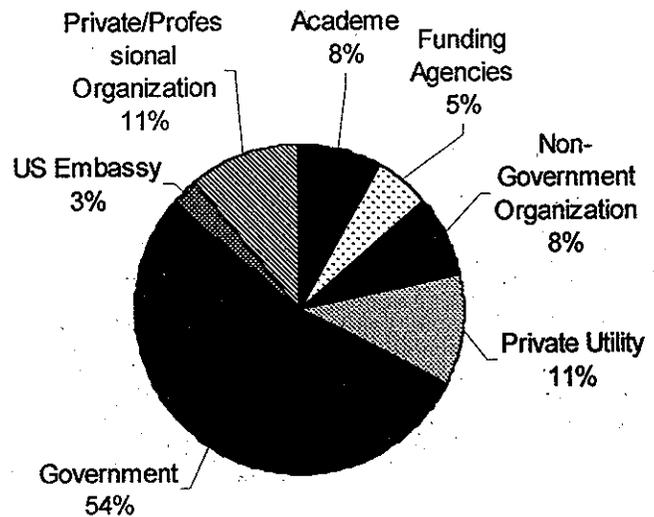
## US Agencies

- 2 US Agency for International Development
- 1 US Embassy

## Non-Government Organization

- 1 Institute of Climate, Energy & Environment
- 1 Phil. Network on Climate Change
- 1 Foundation for Philippine Environment

By Sector



## Daily Recap, March 27

### Morning Session

•Participants checked-in at 8:00 AM and had breakfast at the Pavilion. Mr. Edmundo Silverio of MMLDC gave an orientation on the facilities.

#### •Opening Program

•Ms. Laura Mateo of Hagler Bailley hosted the opening program and led the singing of the national anthem. Mr. Tito Fortes of Technological and Livelihood Research Center gave the invocation

•Mr. Cat Tatlonghari of USAID welcomed the participants. He stressed that the overarching strategic objective of climate change initiatives is to bring nations closer together around basic principles of equity, transparency and common but differentiated responsibilities. He gave an overview of USAID initiatives such as the climate change action plan for FY 1998 to 2002. The significant component of the action plan is building institutional and human capacity to undertake meaningful participation in international efforts to reduce GHG emissions through policy advances and capacity building efforts.

#### •Workshop Overview and Objectives – Dr. A. Golub / Atty. M. C. Dalupan

•Dr. Alexander Golub started the session by discussing an overview and the objectives of the 4-day workshop. Atty. Ma. Cecilia G. Dalupan then presented an overview of GOP initiatives.

#### •The Science of Climate Change – Prof. M. McElroy

•Prof. McElroy talked on the science of climate change where he discussed the global climate change situation and the increasing CO<sub>2</sub> concentration, specifically the following:

- >the greenhouse effect – what is it that determines average temperature of the earth
- >how does one predict what might happen as greenhouse gas emissions continue
- >different greenhouse gases: carbon dioxide, methane and nitrous oxide (N<sub>2</sub>O) and the sources of these emissions

•Extended exchanges and sharing of information:

#### Points raised were as follows:

1. There is a need to have a sense of the natural variability of the earth's climate.

2..Humans are the only species who can think and who can realize the consequences of their actions and do something about them.

3.Humans are moving too fast. We need to allocate responsibilities properly– equity is primary issue.

4.All countries have a responsibility with respect to global climate change.

5.Dealing with issues associated with methane and nitrous oxide are more complicated that dealing with CO<sub>2</sub>.

6.Photosynthesis is a natural resolution to climate change concerns, so focus should be on reforestation, on using a permanent portion of land for trees.

7.Note that people use a significant part of land for agriculture and other important uses; that there may not be as much freedom in withdrawing that land from agriculture use, given food production needs.

8.Deforestation always seems focused on the tropics.

9.In a number of developed countries (like the US/UK), little or no deforestation but rather, reforestation is taking place; their experience of many, many years ago is that with the advent of the industrial revolution, their wood resources were depleted, so switched to coal or other sources of energy.

10.Developing countries are most vulnerable to impacts of climate change and the least capable of adapting. Is the US conscious of the consequences of climate change for other countries?

11.There is a range of attitudes in the US with respect to climate change.

12.The US must show, by domestic action, that they are serious about climate change, and not just 'buy' their way to compliance.

13.The challenge is to find ways to produce more wealth with less carbon.

14.There are various technological options but there is a need to provide incentives for innovation.

15.How can the Philippines afford mitigation when it can't even adapt to climate change consequences?

As a response, it was suggested that the Philippines can continue its leadership role in international climate change negotiations to find creative options for developing country participation in the climate change regime.

16.Desire is to focus on what we can do, not what we can't.

### Afternoon Session

•The afternoon session started by a message by DOE Undersecretary Cyrill del Callar who emphasized that the Government of the Philippines (GOP) has done so much already to address climate change issues. These include the publication of the Philippine's Initial National Communication on Climate Change and embarking on three major programs with USAID, namely: Clean fuel, Energy efficiency, and Policy Development.

#### •The Impact of Climate Change/Evaluating the Effects of Climate Change – by Prof. McElroy

•Prof. McElroy talked on how climate system works, what happens to particular regions of the world due to the effects of climate change, and presented predictive models that would describe the climate system but stressed that it is an enormous task.

#### • Questions / Points raised:

- 1.What about vulnerability studies – how can we get funding for these?
- 2.Note US Sec of State's significant statement where he said that international environmental issues are of importance to US foreign policy.
- 3.Note recent CIA head's recent statement that international environmental issues are matters of US national security interest.
- 4.Prof. McElroy's opinion: amend the Kyoto protocol to allow for a longer time line to enable countries to make better economic decisions, consider historical and present emissions; developing countries to determine what their emissions profile is and let that be their commitment

#### •Economics of Global Climate Policy – by Prof. R. Stavins

•Prof. R. Stavins cited that environmental economics is not only limited to climate change but to different environmental issues. Economics also deals with human welfare.

#### •Two assertions:

- 1.Causes of environmental problems are economic in nature. For example, an electric utility firm emitting pollution is hampered by constraints to cut back on pollution levels, which entails costs. Such constraints include the competitive market environment and fiduciary responsibility of maximizing returns to shareholders.

2.Consequences of environmental problems have important economic dimensions. Externalities of environmental pollution are:

- producer to another producer (pollution emitted by electric utilities to another company like laundry service)
  - producer to consumer (effect of pollution to a child's growth)
  - consumer to another consumer ( smokers' effect to non-smokers)
  - consumer to producer (spilling popcorn in the movie theater would increase cost and increase prices)
- Economic value of environmental quality is whatever a person (society) would sacrifice for it. Environmental pollution that affects human health has economic costs, which include opportunity costs (decreased productivity, decreased happiness/quality of life, etc).
- A person or society's willingness-to-accept (WTA) or willingness-to-pay (WPA) is the economic value of environmental quality:
    - Willingness to accept (WTA) – How much compensation are you willing to accept for the damages?
    - Willingness to pay (WTP)- How much would you pay to avoid it happening?
  - Economic benefits of environmental policy are equal to the damages that are avoided. Look at the damages if the policy is not in place.
  - Criteria for choosing pollution control levels
    - 1.Efficient level of pollution control - where marginal benefits equal marginal costs.
    - 2.Equity - Who gets the benefits and who pays the cost

### Evening Session

#### •Introductions of participants - Asec Lisa Andres and Atty. Ma. Cecilia Dalupan

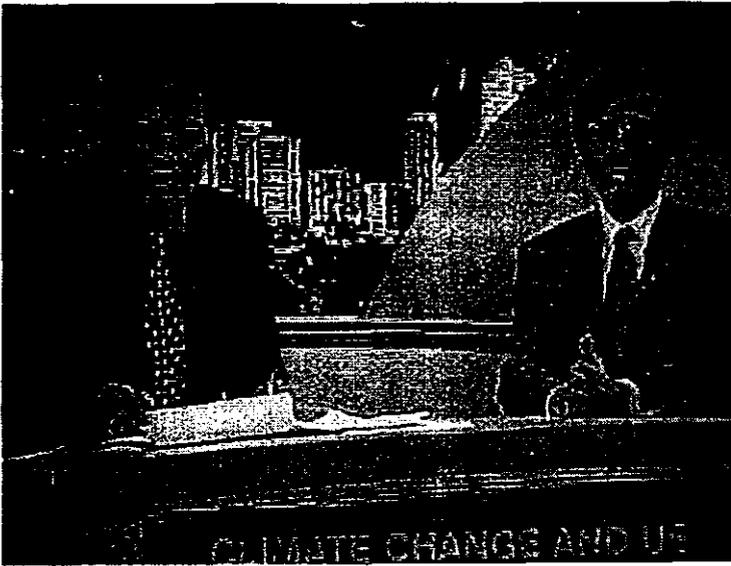
•brief sharing of background and expectations

#### •Next steps – Dr. A. Golub & Ms. A. Peterson

•A description of the mechanics for the mini-workshop to be held on Day 3 and 4 was presented. Participants will break out into three discussion groups electing a rapporteur and a presenter.

#### •Q & A - facilitated by Dr. A. Golub and Ms. A. Peterson

–Most discussed point was the clean air act IRR with various participants sharing their views and proposals.



Dr. R. Stavins with TV Journalist Gene Orejana, Live on SNN Channel (March 27, 2000 at 7 pm)

## On-Line with Gene Orejana: "Climate Change and Us"

Featured last night, live on "On-Line with Gene Orejana" at the SNN Channel, was Prof. R. Stavins on the topic "Climate Change and Us". Prof. Stavins is the Chair of the Environmental Economics Advisory Committee of the U.S. Environmental Protection Agency's (EPA) science advisory board.

## Climate Change Trivia

1. What was the hottest year on record since 1980?
2. Unless we burn fewer fossil fuels and reduce the release of GHG into the atmosphere, by how many degrees (in Fahrenheit) will global warming continue to rise over the next 100 years?
3. How many countries signed the United Nations Framework Convention on Climate Change in 1992?
4. Under the same agreement, to what year did the developed countries aim to reduce their GHG emissions levels by the year 2000?



### The Philippine Climate Change Information Center Manila Observatory

*cordially invites you to attend the briefing*

### Facing the Challenges of Climate Change

A Lecture by Harvard Professors

Dr. Alexander Golub

Prof. Michael McElroy

Ms. Alix Peterson

on Friday, the 31<sup>st</sup> day of March, 2000  
from 8:30 to 11:30 in the morning  
at the Escaler Hall, Science Education Complex,  
Ateneo de Manila University Campus  
Loyola Heights, Quezon City

RSVP: Ms. Tina Angustia or Ms. Lanie Dychinco  
426-5921 to 23 and 426-0837



# Planet Focus

Issue 3

29 March 2000

## AmCham Meets with Climate Change Expert



Members of the American Chamber of Commerce (AmCham) yesterday were introduced to the phenomenon of climate change and global warming by Harvard's leading expert on the Earth's atmospheric chemistry. Prof. Michael McElroy of the Harvard Institute for International Development (HIID) and Ms. Chato Calderon, Global Climate Change Senior Technical Adviser, Office of Environmental Management of the US Agency for International Development (USAID), discussed with members of the chamber the effects of continued greenhouse gas (GHG) emissions to global warming

In a joint meeting of the committees on Energy and Environment chaired by George Henefeld, Vice President of Southern Energy, AmCham expressed its concern on the uncertain participation of countries like China in the global effort to reduce GHG emissions. China is one of today's leading contributors of GHG emissions, coming particularly from its coal-fired power plants.

Ms Calderon also informed the chamber of the on-going efforts of the Philippine Department of Energy and the USAID to mitigate climate change through the Philippines Climate Change Mitigation Program. The program aims to reduce the country's GHG emissions by 20 million metric tons by the year 2002.

### Climate Change Trivia



1. In what year did 49 Nobel Prize winners & 700 members of the National Academy of Sciences said there is a "broad agreement" among scientists that the growing greenhouse effect "has the potential to produce dramatic change in climate".
2. In what year did 2,500 scientists signed a historic document, which was formally accepted by 96 nations, that noted the "balance of evidence suggest "that there is a discernible human influence on global climate".
3. What percent can a U.S. household reduce its energy bill with the purchase of products with the Energy Star.

Answer to Yesterday's Trivia:

- 1) 1998    2) 3.6°F    3) 150 countries    4) 1990

# Now is the winter of our discontent

The winter of 1999-2000 was the warmest winter in the U.S. since the government began keeping records 105 years ago, marking the third year in a row of record warm winters, said the National Oceanic and Atmospheric Administration. From December 1999 through February 2000, every state in the contiguous U.S. was warmer than its long-term average, and in many places from the Northern Plains to New England, the first snowfall and first freeze came later than ever. Since 1980, more than two-thirds of U.S. winters have been warmer than the long-term national average. NOAA attributes the warming in part to human-caused global warming. Milder winters are consistent with a global warming trend that most scientists believe is at least partially caused by humans.

Source: New York Times, William K. Stevens, 03.13.00

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## Participants Speak.....

The "Climate Change and Development Workshop" is a good eye opener that made the obvious evident. The necessity to address the human induced or controllable component of climate change is immediate, but requires substantial investment of money and resources.

Due to lack of resources, development of CDM projects for newly developing countries to avail of "International Emissions Trading and JI" benefits becomes a viable and practical option. However, this will only be an effective option if there will be systematic and organized studies to prepare for the bargaining process – identifying workable and ample enough emission reduction projects/programs and also the potential and actual damages of GHG and CC then quantify the compensable amounts. These revenues can be properly utilized for mitigating damages from climate change and funding socio-economic development projects for faster recovery, instead of sitting back and doing nothing, or trying to fight mother nature as we did with Pinatubo, which only enriched some individuals.

---*Wilfrido Nava*, Vice President, Philippine Pollution Prevention Roundtable

The wealth of insights and experiential learning derived from this activity demands a compelling imperative on me to cascade this down to the 119 Electric Cooperatives (ECs) nationwide, they, being the actual implementors of the Barangay Electrification Program. The development of information campaign that is grassroot-based could translate into tremendous impact in achieving a minimized-pollution-atmosphere environment.

Climate change training to the ECs when properly disseminated would motivate ECs to achieve operational efficiency specifically in the reduction of systems loss, which in the process would mean reduced power-generation (reduced burning of fuel), thus, a reduced emission of carbon dioxide.

Indeed, this "Harvard-Sharing" is a fruitful exercise, which should be shared to the other parties /clients of interests to achieve the purpose for which it is basically designed.

A substantial THANKS!

---*Jocelyn Capule, Ph.D.*, Technical Assistant to the Administrator, National Electrification Administration (NEA)

What to me is the most important thing that we have achieved in this Workshop is the increased level of awareness of climate change issues among the participants. Considering that in the very near future we may see some adverse impacts that can be irreversible, there is a need for us to act.

The balance of scientific evidence suggests discernible human influence on global climate. This means that the very rapid industrialization in the North had dumped greenhouse gas emissions in the atmosphere and had caused the rise in global mean temperatures. Climate has no boundaries. Whatever happens in the rich countries in the North affects everyone over the globe as can be seen in the projected impacts of climate change on all sectors. We are, in fact, seeing more and more climate variability and our capability to deal with the adverse impacts of these extreme climate events such as droughts and floods is almost nil.



Department of Energy



US Agency for International Development

We all have to deal with these climate change issues. But there should be an equitable distribution of responsibilities. All member countries to the UNFCCC have common but differentiated responsibilities. The Philippines has the responsibility to attain sustainable development without following the path of wanton disregard for the environment. On the other hand, developed countries who are largely to be blamed for these increase concentrations of greenhouse gases in the atmosphere must abide by the "polluters pay" principle in addition to domestic action in meeting their reduction targets in order to help us develop a capacity to address climate change

---*Lourdes V. Tibig*, Chief, Climate Data Section, Climatology & Agrometeorology Division, PAGASA, Department of Science and Technology (DOST)

## Daily Recap, March 28

### DOE-USAID-Harvard Climate Change and Development Workshop

Recap of 28 March 2000

#### Sessions

#### I. Recap of previous day's activities and lecture: Ma. Cecile Dalupan

#### II. Lectures/Presentations

##### A. Dr. Robert Stavins: Economics of Global Climate Change

*Lecture Objective:* To provide analytical tools to analyze climate change issues – basic economics

Summary of previous lecture on economics and the environment –

#### •Environmental problems:

- > that they are fundamentally caused by economic externalities – economic decisions that have negative impacts on the others (individuals, other firms and the like)
- > that their consequences have important economic dimensions

#### Criteria for choosing the optimum level of environmental protection

#### •Economic efficiency

- > maximizing net benefits
- > issue is who gets the benefits/who pays for the costs, i.e., *distributional equity*
- > benefits from investments in environmental protection are avoided damages, however they may be difficult to measure

#### •Cost-effectiveness

- > minimizing total cost
- > easier to analyze and less controversial
- > danger is cost-effective way may not always be the efficient way, i.e., may be like "designing fast trains to the wrong stations"

- > policy is cost-effective if it is the cheapest means of achieving target after considering alternatives, i.e., if policy instruments equate marginal cost of abatement across polluters

#### Policy Instruments

##### *Command-and-Control*

##### a) Technology standards

- > all must use the same kind of technology e.g., the use of scrubbers as a technological approach to the problem of acid rain.
- > not cost-effective
- > not dynamically cost-effective (does not provide incentives to invest in new technology)
- > low monitoring/enforcement costs

##### b) Performance standards

- > an improvement over technology standard because one has a choice on the use of the best technology available
- > may be of two types:
  1. uniform standards: not cost-effective; "sort of" dynamically cost-effective (provide incentive for innovation)
  2. non-uniform standards: In theory, a better policy but poses information problems, i.e., government has to have information on all the firms' marginal abatement costs. Specific problems with non-uniform standard:
    - i) firms may not divulge the real situation
    - ii) firms may not know if they are low cost or high cost control
    - iii) may be politically infeasible to implement

##### *Market-Based Instruments*

##### a) Emission Tax

- > for every unit of pollution emitted, tax is paid
- > cost-effective
- > dynamically cost-effective because it provides an incentive to look for the best use of technology to effect savings in the long run. This means lower cost to private industry. The idea is for each source to strike a balance between the tax and the marginal cost.
- > depends on enforcement and efficiency of tax collection

## Daily Recap, March 28

>to know the tax level to set, government doesn't require much information; doesn't need to know marginal cost of pollution control for all firms but only the total/overall MC function or the supply function

>pollution tax is transparent, easy for consumers to calculate the cost of environmental protection, thus, from the economists' perspective, it enables individuals to make better decisions.

>for environmental advocates, transparency could be a problem because they want to have as much pollution control as possible

### Bad news with Emission Tax

i) still has information problem (although at a smaller scale)

ii)regulated sector would not like it – maybe more expensive than command-and-control

iii)tax transparency

iv)the T (tax) word – people don't like taxes

### b)Tradable Permits

>firms can trade permits to emit pollution and undertake abatement in areas where it is cheaper to do it

>equity issue: it makes a difference how the permits are allocated

>emission targets are set by government, market/firms determine the cost of doing it

### Economics of Technological Change for Global Climate Policy

>Different policy instruments are anticipated to have different effects on technological change

- Market-Based Instruments
- Command-and-Control

### >Process of Technological Change

- Invention, Innovation, Diffusion, Utilization

### >Factors affecting diffusion

- Change in price – for a 10% change in price, adoption is less than 10%
- Adoption cost subsidies more effective than taxes
- Regulations had no discernible effect

### Kyoto Protocol

#### >Emission reduction targets

-To appreciate emission reduction targets, one has to know about country's energy circumstances, e.g., Australia is a coal exporter

-In the case of Russia, economy collapsed prior to 1990, hence, emission was way below targets

#### >Joint implementation

-concept is good for financial transfers but flawed as a climate change measure

-problem is lack of observable baseline

-mere turnover of capital stock results in efficiency

-"hot air" issue : countries getting more permits than what they need and selling them

### **B. Ms. Cecile Dalupan: Potential Impacts of Climate Change in the Philippines**

#### >Temperature and rainfall impacts of climate change

-Average increase of 2 to 3°C in annual temperature

-increase in rainfall distribution in many areas

#### >These will have corresponding impacts on:

1. Water Resources – great variability in rainfall with respect to time will have significant implications on water availability. The water requirement of the agricultural sector will be impacted due to increased crop activity. With respect to domestic water consumption, the expected increase in temperature will surely have an effect although a quantitative analysis has yet to be identified

2. Coastal Resources – climate change may aggravate existing coastal problems and lead to a range of impacts including sea level rise, changes in storminess, precipitation and freshwater availability. Accelerated sea level rise may also affect physical and biological systems along the coastal areas, port and coastal infrastructure as well as traditional lifestyles and culture in the coastal zones.

## Daily Recap, March 28

3. Forestry - Climate change may increase the rate of conversion of forests to agricultural lands due to human migration from areas degraded by drought and erosion to more productive forestlands. It may accelerate forest loss, increase runoff resulting in soil erosion and floods. Local biodiversity may also decrease. It may have severe impacts on mangroves.

4. Health - Although further studies need to be done, rough projections show that there is an association between climate change and the incidence of diseases such as those with are droplet-spread (ex. Bronchitis, pneumonia etc)

### *Comments and suggestions:*

1. List down strategies to be undertaken by the country for both climate mitigation and adaptation activities. Presently, there are no comprehensive studies on the impact of climate change for the Philippines, as well as the budgetary requirements to address this problem. At the moment though, there is no national budget allocation for climate mitigation and adaptation activities.

2. There should be concrete plans on how to inform the people about the climate change problem. Although local action planning consultations were done but these were limited in nature. Only a few provinces were included due to budgetary deficiencies.

3. There is a need for inter-departmental efforts to address these climate problems. More serious studies should be conducted quantifying the effects and impacts of climate change in the country e.g. intensity of soil erosion, siltation and other problems.

4. The absence of accurate information for other provinces (e.g. inability to quantify accurately the rise in the sea level in the province of Jolo) is due to the absence of sufficient data on these areas.

### **C. Flordeliza Andres: Philippine Greenhouse Gas Inventory and Potential for Reduction**

> 1994 GHG inventory (by the Manila Observatory)

-Energy sector is the biggest contributor to CO<sub>2</sub> emissions (50%) followed by agriculture  
-Among the energy consuming sectors, the energy industries (power generation) and transport account for the highest contributions to CO<sub>2</sub> emissions

### > Energy Situation and Outlook

-There is a significant decline in oil dependence especially for power generation since the early seventies due to availability and efforts to harness hydropower and geothermal power  
-Energy demand will almost double within the next ten years based on economic growth targets  
-Oil dependence will further decline due to availability of natural gas and increased hydropower use  
-Biomass utilization will remain significant, and its large-scale for rural electrification use is being promoted particularly

### > GHG Forecasts

-by the energy sector will almost double within the next ten years corresponding to the projected increase in energy consumption

### > Energy Policies and Programs

-Policies and programs remain anchored mainly on self-sufficiency/energy security objective but there is also an increasing emphasis on clean fuels/technology and energy efficiency  
-Energy industry restructuring will be more aggressively pursued to promote overall energy sector efficiency  
-Equity considerations may lead to some subsidies, e.g., for expansion of rural electrification and to lower electricity cost to marginalized sectors

### *Comments and Suggestions*

1. Energy sector appears to be doing enough to reduce dependence on dirty fuels and promote energy efficiency but what about the transport sector? Options for fuel substitution not yet feasible but other things could be done, e.g., road and traffic maintenance, mass transport.

2. Impact of energy policies and programs resulting mainly in avoidance of GHG emissions but there are also some that will result in reduction, e.g., retirement of oil-based thermal power plants.

## Daily Recap, March 28

### III. Discussion/Wrap-up

Dr. Golub asked the participants to identify the most pressing impacts of climate change and major areas for greenhouse gas reduction. The results are as follows:

>Four most pressing impacts of climate change:

- a) Increased probability of flooding due to rise in water level
- b) Accelerated sea level rise
- c) Decrease in food production
- d) Health problem

>Five Major Areas for Greenhouse Gas Reduction

- a) Energy industry restructuring
- b) Switch to cleaner fuels e.g. natural gas
- c) Further development of hydroelectric energy
- d) Greater use of geothermal energy
- e) Energy efficiency such as heat rate improvement in power plants and other measures



*Participants discussing with Dr. Stavins last March 28.*

## MASS RELEASE

### ENVIRONMENTAL IMPACT ASSESSMENT NOW ON CD

Securing Environmental Certificate of Compliance or ECC is now easy. The Philippine Environmental Impact Statement (EIS) System, the government policy instrument overseeing environmentally critical projects, has now been turned into an "investor-friendly", interactive CD-ROM entitled "Balancing Business and Environment."

This is part of the DENR's efforts to ensure use of the country's resources for economic growth. The program aims at making the business community understand the EIS process, giving them better access through the system, a range of alternative compliance, even ideas on how to initiate their own environment-friendly measures.

This CD-ROM was designed for that purpose, a do-it-yourself electronic version of DENR's DAO-96-37 undertaken as a cooperative project between the Environmental Management Bureau, the Technology and Livelihood Resource Center (TLRC) and ProProjex, Inc., a local multimedia specialist.

The CD-ROM makes ample use of multimedia techniques to simplify a normally complicated process - text files are illustrated and structured for easy browsing, procedures are turned into graphic, easy-to-follow modules. The user can browse through actual samples of appropriate EIS documents and can even print their own set of official EMB forms by simply clicking on a "print-on-demand" button.

It is comprehensive and up-to-date environmental databank compiled for the needs of environmental professionals as well as for the general information of stakeholders at large. Copies are available at the Environmental Management Bureau at Tel. Nos. 9202243 & 9281214, and thru the Technology and Livelihood Resource Center at tel. No. 6374104 and 6336208 or ProProjex thru Tel. Nos. 3711783 & 3712939.



# Planet First

Issue 4

30 March 2000

## Messages



It is a great honor and pleasure for the DOE to have hosted with USAID this workshop on Climate Change and Development. It is our hope that the workshop has provided the venue for an open and frank discussion of issues and options for the Philippines in addressing its environmental concerns, perhaps, inevitably in the context of the international climate change debate, but more so with respect to the country's own domestic situation and aspirations. We also hope that the select group of participants in this workshop will serve as a network of specialists and champions for sustaining the momentum of discussion as well as coordinating various climate change-related initiatives.

Cyrill del Callar  
Undersecretary, Philippines Department of Energy



USAID is pleased to congratulate the successful participants to the four-day "Climate Change and Development Workshop" held in Antipolo City on March 27-30, 2000. I wish to thank the Department of Energy and the Department of Environment and Natural Resources (DENR) for this collaborative effort for bringing to the Philippines this abridged course developed by the Harvard Institute for International Development (HIID).

The workshop is significant in providing the participants with a venue for an exchange of views on the complex issues of climate change as it affects the economies of nations, particularly the Philippines.

I also wish to extend my appreciation to the Harvard lecturers, Dr. Michael McElroy, Dr. Robert Stavins, Dr. Alexander Golub, and Ms. Alix Peterson for spending time with us in the Philippines and leading engaged and innovative discussions.

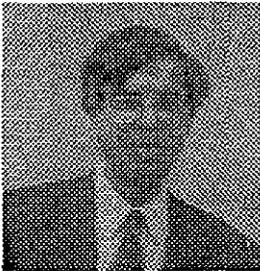
Patricia K. Buckles  
Mission Director, USAID



I have very much enjoyed my brief visit to the Philippines and I hope that I will have the opportunity to return soon and see more of your beautiful country. The Philippines is particularly vulnerable to environmental change, whether it arises as a result of natural forces such as the eruption of Mt. Pinatubo or as a consequence of a change in climate induced by emission of greenhouse gases. I am impressed at the diversity of the backgrounds represented by the participants of the workshop and by the skill and ingenuity they brought to our discussions. I hope that the efforts of the workshop will contribute to the formulation of a comprehensive global strategy to mitigate the serious anticipated consequences of climate change.

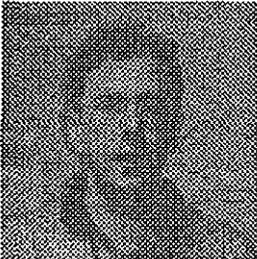
Prof. Michael McElroy  
JFK School of Government, Harvard University

## Messages



Whenever I use my new laser pointer in class at Harvard, I will think about all of you. It's been a delight working with and meeting you all. Thanks for your wonderful hospitality.

Prof. Robert Stavins  
John F. Kennedy School of Government, Harvard University



Prevention of the climate change is our common goal. Different countries have different opportunities to contribute to this process. The Kyoto Protocol to UNFCCC gives developing nations a chance to provide their own contribution and improve the main economic indicators. I believe that the Philippines can combine economic growth and GHG emission reduction. The Kyoto flexible mechanisms would help to implement its sustainable development strategy. According to my very preliminary estimations, participation in the flexible mechanisms can bring to the country up to \$100 million. But the Philippines has to elaborate an efficient plan of participation in the flexible mechanisms. I think you have enough of capacity to successfully implement the plan. During the workshop, I met very qualified specialists. I'm very optimistic about the ability of the Philippines to participate in elaborate and international cooperation to fight climate change

Alexander Golub, Ph.D.  
John F. Kennedy School of Government, Harvard University



I thank the workshop participants for the thoughtful and stimulating discussions that we have had over the past four days. I have learned much from you about the developing country perspective on climate change and the Philippines in particular. I hope I have been able to share some tools with you as well for your future work on the challenge of environmental protection.

Alix Peterson  
John F. Kennedy School of Government, Harvard University



I am very pleased to be a part of this HIID Workshop on Climate Change and Development. As a Teaching Fellow, it gave me the opportunity to work with a prestigious organization while at the same time learning more about the dynamics behind the climate change debate not only from the lecturers but also from the well-selected participants. I am also happy to have shared the DOE's efforts to address environmental concerns through the promotion of cleaner fuels and energy efficiency. I hope that it will help enhance understanding of the country's options for achieving its sustainable development objectives.

Flordeliza Andres  
Assistant Secretary for Policy and Programs, Department of Energy



We may not do "great" things, we may not change the world in one day. BUT, we can change SOME things in our own "small" ways (from some song whose title I don't know). Though let's not forget - There are no "great" deeds, only small acts done with great love (from Mother Teresa).

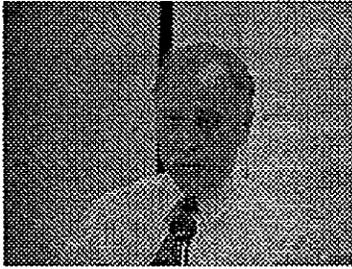
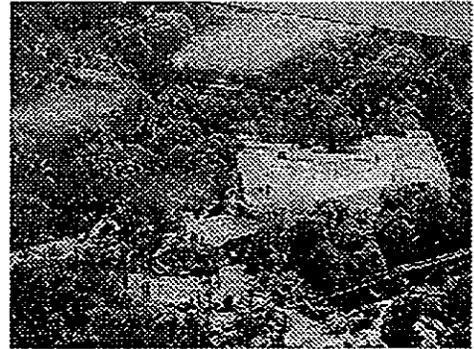
Cecile Dalupan  
Lawyer/Consultant, Environment, Energy and Natural Resources

# Climate Change Trivia



Answers to Yesterday's Trivia:

- 1) 1990
- 2) 1995
- 3) 40%



## Opening Day



# Mini Workshops

Group 2

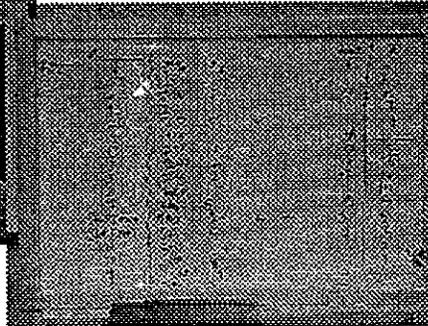
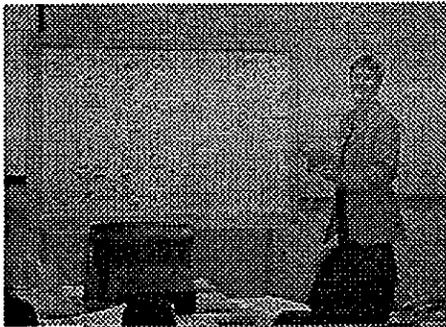


Group 1

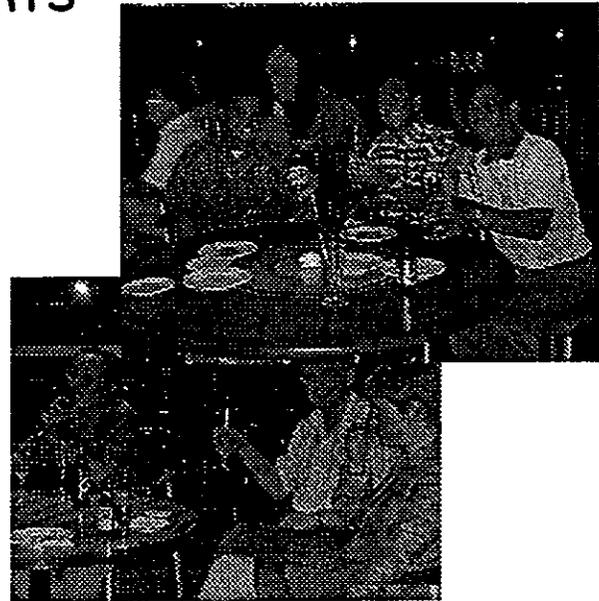


Group 3

# Simulation Game



# Light and Bubbly Moments



# A "Change in Climate"



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## Daily Recap, March 29

### I. Recap of previous day's activities and presentations: ASEC Lisa Andres

ASEC Andres gave a review of important points discussed during the previous day. Atty. Dalupan also made a clarification regarding the table presented previously on the potential projected accelerated sea level rise (ASLR), i.e. that there is no certainty as to if and when the country might be affected by this. Previous studies have identified only those areas which would be threatened in the event of ASLR. In this regard, it was noted that geological factors are relevant in determining whether there is really sea level rise or subsidence. Consequently, care should be taken when making projections and further studies are needed.

Others noted that there are areas where ASLR is already being experienced and that these should be documented. This would be necessary for emergency-preparedness programs and would allow us to prepare mechanisms for adaptation. Others noted that there have been many initiatives aimed at raising public awareness but more areas still need to be reached especially since all sectors stand to be affected. It was suggested that an action plan should be made by all sectors including the government and private sector.

### II. Benefits from GHG Mitigation Energy saving, Productivity of Agriculture, & Human Health Protection – Prof. M. McElroy

Prof. McElroy began by pointing out the difficulty in assessing sea level rise, but that the global rate of sea level rise is about 10 cm. He then proceeded with a review of the experience of developed countries during the industrial revolution, and the 'environmental mistakes' they made in the process. Thus, developing countries have the opportunity to learn from these mistakes in their own paths toward development.

By way of examples, he pointed out the experiences of the US with coal burning in the 1940's, acid rain and 'bad' ozone in more recent years. Negative environmental impacts of industrial activities were accepted as part of the 'price of progress' until a wake-up call occurred in the form of health problems and even fatalities. Government was then pressed to take corresponding measures by citizens themselves, particularly at the local levels. One of the challenges in addressing environmental problems is technological. When the sources of the problems have been identified, technological changes may be introduced to respond to these sources.

Developing countries may have the opportunity to do better by not committing the same mistakes as the those made by western countries. The challenge is to analyze what can be done differently, so that the price of progress is not air quality, health or other environmental concerns.

Environmental problems are not all local, however, but can have transboundary effects. Pollution emitted in one area is not contained therein but can affect other areas and even countries. Consequently, these are not only domestic issues but international issues calling for international responses.

Climate change issues affect the world as a whole. The attitude that one is only responsible for the problem in one's own country will not help. With respect to CO2 reduction, there are a number of ways of going about this. Conservation and more efficient use of energy is the first thing to do. Next step is to switch from coal or oil to natural gas. Natural gas is the cleanest in emission. He noted that the Philippines is the second largest producer of geothermal energy.

### *Comments and Questions*

In response to some questions raised, Prof. McElroy stated that assuming CO2 emission is completely eliminated by the USA, the problem will be repeated by China and other developing countries. So, there is a need to involve the other countries, especially the developing ones. Rich countries should limit their use of energy. A comment was then made that the Philippines' energy plan shows that we are aware of the issue but that we need to see equitable distribution of responsibilities. We can discuss options but we can't draft Philippine decisions. We can only identify ways to avoid emissions. We want transfer of technology to address the issue.

It was also pointed out that the Philippines is aware of the issues but we don't have the resources for mitigation plans. There should be good coordination because we have so many think tanks. We should have a practical approach and better relationships among the entities concerned. Concern was raised over how developing countries can level the playing field in terms of addressing the climate problem.

Finally, it was suggested that instead of debating the effectiveness of the Kyoto protocol, we should ask what other countries are doing and what we can do. Prof. McElroy pointed out that creative measures can be sought as in the case of companies which take on Kyoto standards in its internal operations.

## Daily Recap, March 29 (continued)

### III. Mini-Workshops / Break-Out Groups

After receiving general instructions from Dr. Golub, the participants were divided into 3 groups to discuss 'next steps' on the following:

- Adaptation
- Role of the Phil in the international arena
- GHG avoidance/reduction

Each of these groups selected their 'leader' and recorder while the HIID faculty, teaching fellows and workshop staff joined them as observers.

### IV. Emissions Trading Simulation Exercise

The participants were divided into teams after which Ms. Alix Peterson gave a briefing on the objectives and mechanics of this exercise. The teams represented companies which were now tasked to design their operating strategies in the light of emissions trading regulations which required their industry to reduce SO<sub>2</sub> emissions by 40%. With 2 free permits representing 200 tons each of SO<sub>2</sub> emission allowances, they then had to decide how they would 'play' in the market with the goal of making as much profit for their company. After studying their options, a government auction was held, followed by an auction of permits which some of the companies wanted to sell.

The big winner in the emission trading simulation game was the Faraday firm with 17 M in profit. Some firms shut down, some had modest profits, while others suffered huge losses. Ms. Alix Peterson then discussed the results with the whole group. She pointed out that the trading system allows companies to take advantage of their differences in abatement costs, whereas under a command-and-control scenario, all companies are made to comply with the same standard regardless of their appropriateness to their specific circumstances. She also pointed out the following important issues with respect to emissions trading:

- Transactions Costs
- Learning
- Market Power
- Information Requirements

#### Comments/Questions:

- Perhaps the Philippines can draw lessons from its experience with independent power producers (IPPS) in order to benefit from international emissions trading if it happens. The IPP program had to contend with the same issues as Alix pointed out, e.g. range firms with considerable market power to such concessions and get the 'best deal', and transaction costs

arising from the numerous contracts and arrangements resorted to in order to secure market and political risks.

- Emission monitoring is costly.
- The standard is set by Congress or some other entity, and may not always be the 'right' one.
- For an international trading situation under the FCCC, trading would be through governments

### V. Presentation of Group Report

The leaders of the 3 different groups which participated in the Mini-workshop in the morning then presented the output of their sessions. The major areas of discussion were adaptation, the role of the Philippines in the international arena, and GHG avoidance/mitigation.

#### A. Group 1's Output

##### *Adaptation*

1. Executive Order on Climate Change
  - IEC
  - Build baseline information for monitoring geogenic and anthropogenic CC effects
  - Conduct vulnerability assessments to determine appropriate adaptation measures esp. for most critical sites/sectors
  - Study factors complicating CC effects assessment such as subsidence due to groundwater extraction and rising sea level.
  - so that CC concerns are integrated into the national development plans and programs
2. Climate Change Act

##### *Country's Role*

1. To continue participation in the development of mechanisms and institutions for the eventual entry into force of the Kyoto Protocol taking into consideration equity, transparency, efficiency, ...
2. Minimize GHG emissions
3. Lead by example: thru legislation, IEC, etc.
4. Aim for SD: for equitable distribution of resources and opportunities.

##### *Emissions Reduction/Avoidance*

1. Prioritize CC concerns re the Transport sector
  - development and use of an efficient mass transport system
  - compressed natural gas
  - Political will – phaseout of jeepneys and tricycles
  - Philippine Clean Air Act implementation
2. Regulation/incentives to encourage devt. and use of RE sources

## Daily Recap, March 29 (continued)

3. Research on low methane-emitting rice varieties; address agri contribution
4. IEC to increase public awareness
5. Review Power Development Plan to minimize CO2 emissions.
6. Quantify costs of CC actions vs. "business as usual" scenario for possible funding.

B. Group 2's Output*Adaptation*

- Enhance IEC activities
- IACC to spearhead activities using the Pangasinan experience as model
- Get resources/necessary funding
- Tap concerned agencies (national government, NGOs, LGUs, etc) to ensure 100% (nationwide) coverage
- Identify projects that could be implemented through the leagues (League of Municipalities, League of Cities, etc.) and the timetable for project implementation
- Determine funding sources and mechanisms
- Set-up monitoring body/group that will evaluate projects

*Philippine Role In The International Arena*

- Strongly advocate the immediate ratification of the Kyoto Protocol; it could be insisted that the Kyoto Protocol be ratified soon even if there is no definition yet of the nature of participation of the developing countries considering that it is the developed countries which contribute the most in GHG emissions.
- Long-term involvement of the Philippines in international climate change for a
- International advocacy role on the adverse effects of climate change
- Examination of barriers (implications and loop holes) to using forests for carbon sequestration
- Develop projects and programs for reducing emission using leverage from developed countries
- Participate in international audits and inspection of effects of climate change

*Local Ghg Emission Reduction/Avoidance*

Develop new and renewable energy (NRE), and clean and indigenous power projects

- Energy efficiency
- Promotion of mass transport, non-motorized and energy efficient modes of transportation

C. Group 3's Output*Adaptation to Climate Change*

## Macro Level

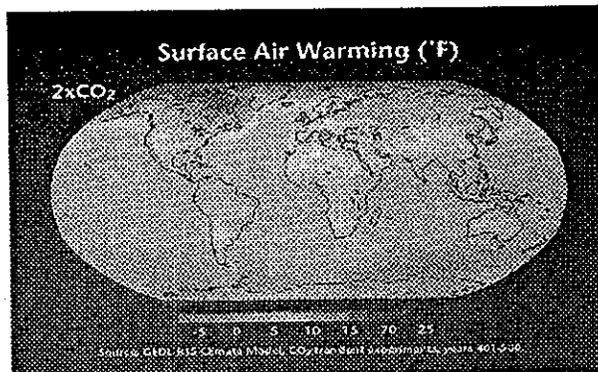
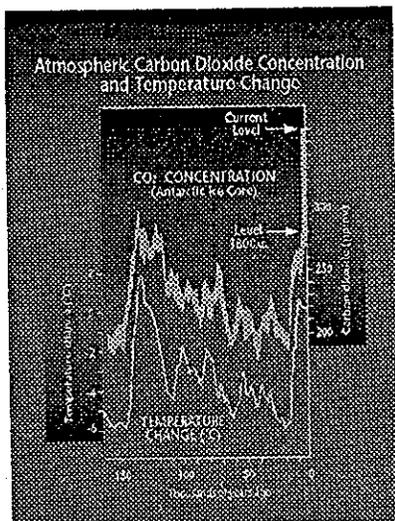
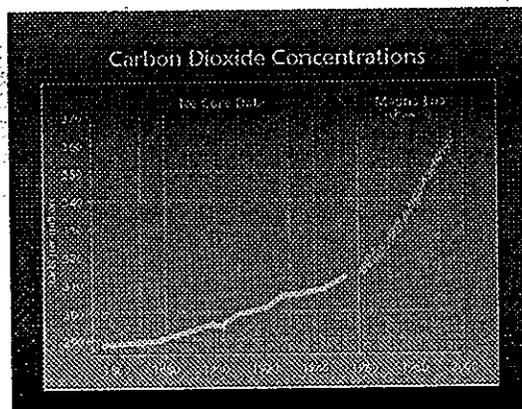
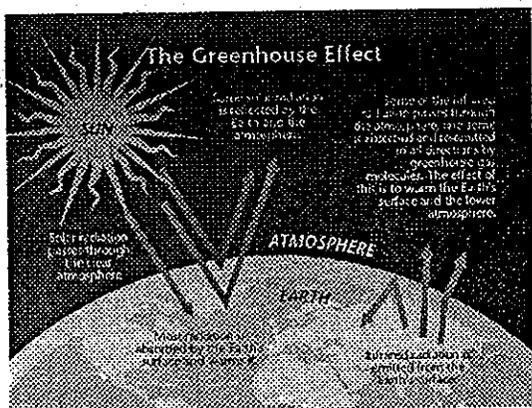
What	Who
1. Vulnerability Assessment to climate change (site specific)	Inter-agency Committee on Climate Change (IACCC) expert scientists Local government Civil Society National Agencies Academe
2. LAP model for response to vulnerability	FPE Sectoral experts academe
3. Information dissemination on vulnerability and response to climate change	Church Climate Change Information Center (CCIC) Non-government organizations (NGOs) Local government Media
4. Coordinating mechanism among concerned agencies	CCIC National Disaster Coordinating Council (NDCC) Phil. Council for Sustainable Development (PCSD) IACCC
5. Use El Niño phenomena as jump off point for action	Strategy for 1 & 2

Daily Recap, March 29 (continued)

Micro Level

What	Who	When	Resource
1. Information dissemination			
a. Conference fora	CCIC	Monthly	donors
b. Printed materials -bill inserts -primers -handouts -video/slides	Utilities(VECO, MERALCO) Foundation for Phil. Environment (FPE) FPE	Monthly April April-May monthly	IACC, GF FPE, USAID FPE, USAID National Gov't
c. Advocacy seminars on energy-efficiency & safety, power patrol, & transport patrol	Department of Energy (DOE)		

The group then discussed and made clarification on various points raised about the outputs. These would be consolidated by the group leaders together with the HIID team for presentation to all the participants the next day.



**APPENDIX F**  
**Workshop Directory**



Philippines Climate Change Mitigation Program

*A Joint Program of the*



Philippines Department of Energy



US Agency for International Development

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# WORKSHOP DIRECTORY

Climate Change and  
Development Workshop

March 27-30, 2000

Manuel M. Lopez Development Center, Antipolo City

conducted by the



Harvard Institute for International Development

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Prime Contractor -  Hagler Bally Services, Inc.

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Phone: (032) 761-9422; Fax: (032) 761-9420; E-Mail: haglerbally@pccmp.com.ph

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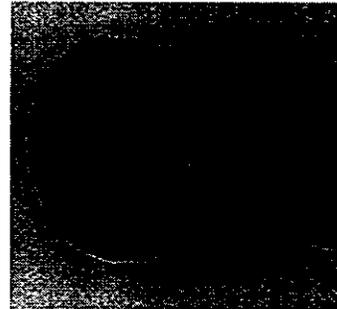
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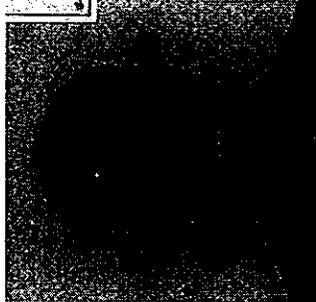
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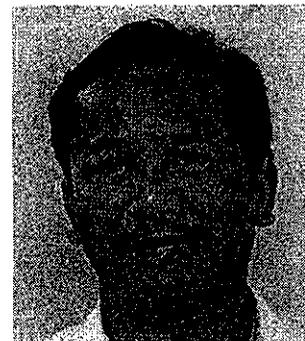
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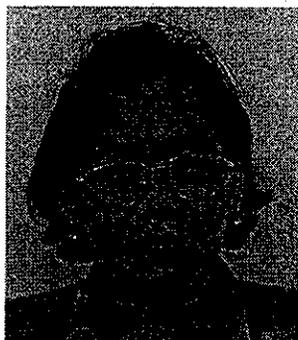
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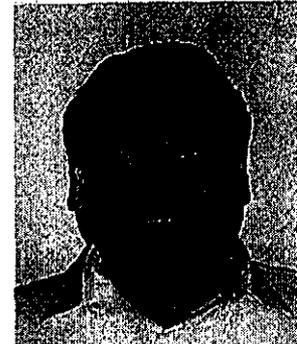
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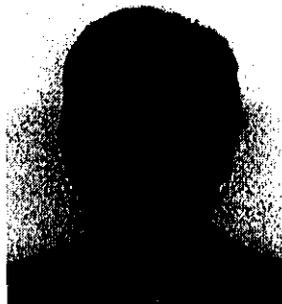
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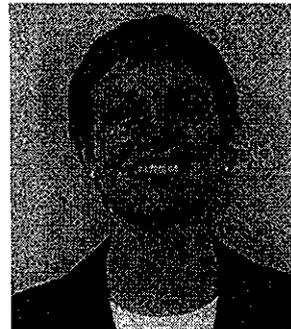


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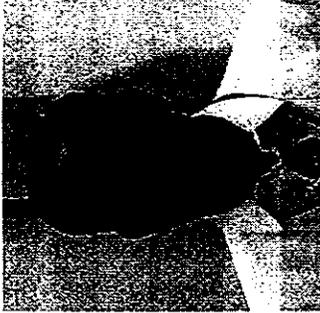


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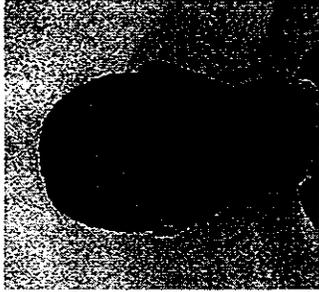


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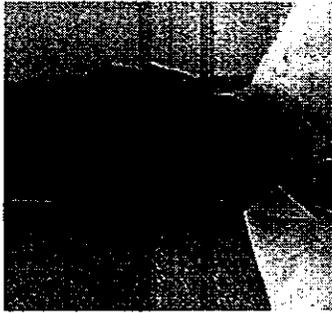
# Workshop Organizers



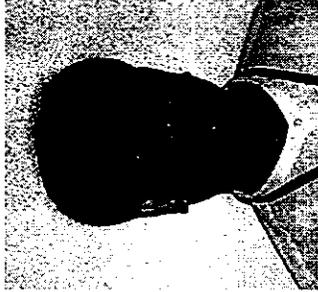
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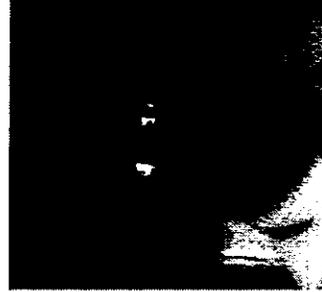
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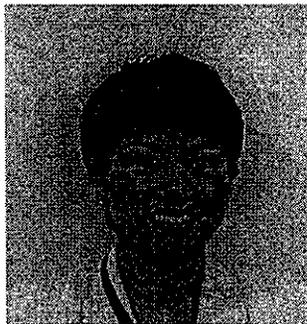
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# Philippines Climate Change Mitigation Program

*A Joint Program of the*



Philippines Department of Energy



US Agency for International Development

## SUMMARY REPORT

### EXECUTIVE BREAKFAST FORUM "FACING THE CHALLENGES OF CLIMATE CHANGE" March 27-30, 2000

Prepared by the:  
**National Engineering Center  
University of the Philippines  
Diliman, Quezon City  
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*This report was prepared under the terms and conditions of Sub-Contract No. AD 201-8S-006. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the USAID and Hagler Bailly Services, Inc.*

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## 1.0 INTRODUCTION

This activity is funded by the United States Agency for International Development (USAID) and organized by Hagler Bailly Services, Inc. through its Philippines Climate Change Mitigation Program (PCCMP), with the assistance of the University of the Philippines – National Engineering Center (UP-NEC).

The lead Government of the Philippines (GOP) agencies, the Department of Energy (DOE) and the Department of Environment and Natural Resources (DENR), jointly undertook the Executive Breakfast Forum entitled "*Facing the Challenges of Climate Change*" on March 27, 2000. The forum was held from 7:00 to 9:00 AM at the Santan 1 & 2 function rooms of the EDSA Plaza Shangri-La Hotel in Mandaluyong City.

## 2.0 OBJECTIVES AND TARGET AUDIENCE

The affair was conducted with the end in view of promoting awareness on climate change issues among key decision-makers in the country. Climate change effects have become evident in the Philippines and other parts of the world. The forum was envisioned to provide a venue for discussion and exchange of information among the participants regarding climate change issues and challenges.

People invited to participate in the forum included high-level government officials from the executive and legislative departments, executives from the power generation and distribution sectors and representatives from the academe and non-government organization which are involved in environmental and climate change issues. These are individuals who have the capability to influence and shape the policy decisions of the country.

### 3.0 PROMOTION AND DISSEMINATION

Invitations signed by the DOE Secretary Mario Tiaoqui and DENR Secretary Antonio Cerilles were sent to the forum guests directly to their offices by a messenger and/or through fax. A copy invitation (Appendix A1) and the list of invitees (Appendix B) are included with this report as attachments. As a follow-up, a thank you card confirming their attendance was likewise sent (Appendix A2).

### 4.0 GUESTS AND PARTICIPANTS

In attendance were forty-two (42) key Cabinet officials and Congressmen from the Philippine government, business executives, and representatives from the academe, non-government organizations (NGOs), officials from the US Embassy and the USAID, and representatives from Hagler Bailly Services, Inc. and UP-National Engineering Center. Present were the following sectors:

<b>Resource Persons</b>	<b>No. of Representatives</b>
Harvard University	2
 <b>Government</b>	
Department of Energy	3
Department of Environment and Natural Resources	3
Department of Interior and Local Government	1
National Economic Development Authority	1
Department of Trade and Industry-Board of Investment	1
Energy Regulatory Board	1
National Electrification Administration	1
Philippine National Oil Company	1
National Power Corporation	1
House of Representatives	4

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**Private Companies**

Manila Electric Company (MERALCO)	1
Cagayan Electric Power and Light Co. (CEPALCO)	2
Davao Light and Power Co.	1

**Professional Organizations**

Philippine Chamber of Commerce and Industry	1
Philippine Electric Plant Owners Association	1

**Non-Government Organizations**

World Energy Council	1
Foundation for Philippine Development	1
Climate Change Information Center	1
Philippine Network on Climate Change	1

**Academe**

University of the Philippines	1
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**US Agencies**

United States Agency for International Development	4
United States Embassy	2

**Organizers**

Hagler Bailly Services, Inc.	2
UP – National Engineering Center	3

**Total Attendance** 42

Dr. Michael B. McElroy and Dr. Robert Stavins, experts from the Harvard Institute for International Development (HIID) were present to discuss key climate change issues and current policy directions to mitigate factors responsible for this phenomenon. Dr. McElroy is the Chair of the Committee on the Environment of the HIID while Dr. Stavins is the Albert Pratt Professor of Business and Government and Faculty Chair of the Environment and Natural Resources Program at the John F. Kennedy School of Government at Harvard University.

A detailed listing of participants is attached as Appendix C. The guest book used in the forum is included with this report as Appendix F.

## 5.0 SYNTHESIS

Secretary Mario Tiaoqui of the DOE welcomed the guests and signaled the start of the forum. Undersecretary Cyrill del Callar of DOE acted as moderator.

Dr. McElroy, gave a brief discussion on the Science of Climate Change – the topic he would be discussing in the Climate Change and Development Workshop which was to be held later that morning at the Manuel M. Lopez Development Center in Antipolo City. Dr. Robert Stavins talked about the economics of climate change.

Dr. McElroy explained the issues about climate change and global warming. He cited the greenhouse effect phenomenon, explaining that greenhouse gases (which include carbon dioxide, methane, water and nitrous oxide) act as an insulator to the planet earth, trapping some of the energy that reaches the earth from the sun. The increasing human activities have resulted in increased concentration of greenhouse gases in the atmosphere, thus increasing the atmosphere's capability in trapping infrared radiation, and therefore results to global warming.

Two conditions were identified to prove that climate change is indeed occurring around the world. First, the rising global temperatures that have been recorded in the past decades. Second, the characteristics of the El Niño occurrences in the tropics, its frequency and intensity. Dr. McElroy made mention of a damage model which indicated that a significant amount of forest in the tropics would be lost as a result of climate change.

Dr. Robert Stavins dealt with the economics and policy challenge involved in climate change. He emphasized that damages that can be caused by climate change could be

so severe that it would be very costly to do remedial actions. He emphasized the link between human activities and climate change and that it is therefore necessary to work through the economy to do something about the problem.

The Kyoto Protocol laid out a means for dealing with the challenge of climate change. Climate change is a challenge since the cost of mitigating it is high and its impacts global. The Protocol specifies greenhouse gas emission targets for the industrial countries. It allows for flexibility to achieve these targets through what are known as Kyoto mechanisms. Dr. Stavins cited two examples. One such mechanism is the Bubble that allows a group of countries to achieve emission targets on a cumulative basis through the reallocation of responsibilities. The other, which Dr. Stavins cited as a more workable mechanism, was that of emissions trading. He said that schemes similar to emissions trading have been used in the US to deal with leaded gasoline and acid rain through the adoption of a tradable permit program. The US was successful in achieving its aimed effect and saved billions of dollars through the program.

During the forum, the participants raised three (3) major concerns: (1) giving of credits to developed countries for undertakings or programs that will reduce emissions in developing countries; (2) the question of equity in the cost of mitigation; (3) third was the conduct of research for alternative fuels and development of potential sources of energy.

Secretary Felipe Medalla raised the first issue when he asked if Japan would be given credits for the mass transportation system program that is currently being implemented in the Philippines which results in fewer emissions. This is related to the Clean Development Mechanism (CDM), a mechanism to reduce emissions where developed countries will be given credits for involvement in projects reducing emissions in developing countries. Dr. Stavins replied said that there are problems in implementing such a mechanism since there are no established baseline data regarding financial and environmental conditions in the developing countries.

Cong. Florencio Abad asked how equity could be promoted in the distribution and cost of mitigation. As follow-up, Ms. Amelia Supetran asked how developing countries, especially island countries, could join in the emissions trading when they do not have emissions to trade.

On the question of equity, Dr. Stavins cited that the emissions trading program could address such concerns. A developing country however would have greater difficulty addressing the climate change problem because of the costs involved in the mitigation as compared to developed or industrialized countries.

Cong. Heherson Alvarez of Isabela offered his comments on the climate change initiatives of the Philippines. He identified recent policy actions that indirectly address greenhouse emissions, including the Oil Industry Deregulation, the Clean Air Act and the Power Industry Bill. He said that the Philippines should be given emission credits for such initiatives.

Cong. Alvarez also stated that developed countries could deploy more of its resources on the conduct o research on potential sources of alternative fuels and specific programs like developing sources of renewable energy. He added that funds could be deployed to conduct experimentation in the tropical areas where there is abundance of joint implementation. Research funds can be pooled together.

Sec. Tiaoqui in his closing remarks thanked the participants for attending the forum and reiterated the challenges that we are facing in view of the climate change.

## **6.0 FORUM KIT**

Before leaving, the guests and participants were given a Forum Kit (Appendix D) containing the following:

- The Philippines' Initial National Communication on Climate Change

- Philippine Climate Change Information Center (brochure)
- Harvard Institute for International Development (HIID) brochure on the 3rd Annual Climate Change & Development Training Program
- Primer on Philippines Climate Change Mitigation Program

## **7.0 APPENDICES**

**A – 1) Letter of Invitation  
2) "Thank You" Card**

**B – List of Invitees**

**C – List of Participants**

**D – Forum Kit**

**E – Pictures**

**F – Guest Book**

## APPENDIX B List of Invitees

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**Hon. Loren Legarda**

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