



Conference Summary
International
Conference on
Adaptation and
Loss and
Damage:
Integrating
Scientific
Aspects

*30-31st August 2013,
Bangkok, Thailand*

by

Institute for Global Environmental Strategies, Hayama, Japan
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PREFACE AND ACKNOWLEDGEMENTS

Addressing adaptation and loss and damage associated with climate change has emerged as the linchpin of our collective efforts for effective adaptation to climate change in both short and long-term. To address this concern, the Conference of Parties (COP) 18 that met at Durban have clearly stressed the need to establish institutional arrangements helping the most vulnerable countries develop the capacity and implement appropriate measures. Recognising the need for sharing information and to stimulate result-driven processes, the adaptation stakeholders comprising of the United Nations Environment Program, Asia Pacific Adaptation Network, Institute for Global Environmental Strategies and other network stakeholders, including Asian Development Bank, International Centre for Climate Change and Development, Korea Adaptation Centre for Climate Change, Ministry of Environment of Korea, Regional Resource Centre for Asia and the Pacific and Stockholm Environment Institute, have come together to organise an international conference on adaptation and loss and damage in Bangkok, Thailand during 30-31st August 2013. Funded by the Ministry of the Environment, Government of Japan, the conference has brought together several knowledge leaders consisting of scientists, practitioners and policy community who deliberated on adaptation and loss and damage for two days. The conference has identified several knowledge gaps by taking stock of current level of thinking, concepts and practices that need to be scaled up to make a difference in addressing adaptation and loss and damage. The conference has indicated an unfinished agenda in front of us and once again proved the need for collective action for addressing the challenges posed by climate change. The conference couldn't have been a success without proactive support received from the institutional stakeholders from within and outside the Asia and the Pacific region.

The Organisers

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SUMMARY

The international community has progressively reached a consensus that there will be residual impacts associated with climate change despite implementing adaptation and greenhouse gas mitigation and that there is a need to address these impacts in research and development efforts. Recognising the importance of adaptation and loss and damage (L&D), the 18th Conference of Parties that met in Doha has taken a decision to establish institutional arrangements to help vulnerable countries address the adaptation and loss and damage. In view of this, Japan Ministry of the Environment, Institute for Global Environmental Strategies, Asia Pacific Adaptation Network, United Nations Environment Program, Asian Development Bank, International Centre for Climate Change and Development, Korea Adaptation Centre for Climate Change, Korea Ministry of Environment, Regional Resource Centre for Asia and the Pacific and Stockholm Environment Institute have organised an international conference on adaptation and L&D on 30-31st August in Bangkok, Thailand, with support from Ministry of the Environment Japan, where science, policy and practice communities have gathered to discuss about the current understanding on the issue of adaptation and L&D and the actions required.

It became clear from the conference that the adaptation and L&D has partly been dealt by the disaster risk reduction community for decades in the past. The current debate on adaptation and L&D is about long time scales in the future (centuries and more) when GHG mitigation could start making perceivable differences in climate change impacts. In the short term, the efforts have to address the residual impacts due to inability to scale up adaptation and greenhouse gas mitigation to the extent needed and failure of adaptation actions due to social, scientific and institutional barriers. While doing so, necessity will arise where actors may have to debate about acceptable, tolerable and intolerable risks and policy implications for reaching a consensus on what risks to be tolerated and what risks to be addressed. Notwithstanding the variation in ethical values involved in the debate, as what is tolerable for some may not be tolerable to others, one has to approach the problem on rights ground and not on humanitarian grounds.

On the science front, the limited understanding on adaptation and L&D originates from structural and parametric uncertainties with the scientific tools. There has been very limited progress in projecting the extreme events with high certainty, at scales relevant for decision making, due to limitations with scale issues associated with global circulation models, limited data and understanding of physical processes and their interaction with social and biological systems as well as economic activities and issues with the long term climate records. Experiences suggest that addressing adaptation and L&D could be challenging

even when ample data is available because of issues associated with making available location specific future projections, the ability of scientific community to communicate to the policy community and differences in the understanding between the two. This entails that the interventions have the support of epistemic communities with required expertise and willingness to engage for conceptualising the complex issues, designing and sharing relevant solutions.

In terms of our readiness to address the adaptation and L&D, the picture is not that depressing too. The speakers in the conference opined that several existing adaptation practices, which include risk insurance and community based adaptation, could help in minimising the L&D if one takes the path of transformational adaptation as opposed to incremental adaptation. Transformational adaptation entails identifying innovative practices and implementing them at a scale and place unreached by the current experiences. Recognising synergies, there is a need for climate change adaptation (CCA) and disaster risk reduction (DRR) community to work closely and implement solutions addressing mutual co-benefits. For this to happen, the conference has called upon the international community to strengthen networks to initiate and share the findings of path-breaking research in adaptation and L&D.

For transformational adaptation to take place, making a difference on the ground, the epistemic community and networks engaged in CCA and DRR should converge through active cooperation and collaboration. The international frameworks including Hugo Framework of Action (and its future version) and the climate regime under UNFCCC should strive to strengthen the existing national systems engaged in CCA and DRR. There is a need to promote regional centres of excellence in the field of CCA and DRR with direct mandate to help develop capacities of the national systems. In summary, it was recognized that Climate Compatible Development is where the three areas of mitigation, adaptation and sustainable development intersect. It was also suggested that APAN's future work should include sharing experiences and applying good practices, such as those of Bangladesh and of other countries which were presented during the Conference to all participants. The need and importance of knowledge and data sharing among scientists and stakeholders, as well as cooperation among other knowledge networks were recognized as being significant.

INTRODUCTION

It is widely acknowledged that climate change is giving rise and exacerbating a wide range of negative impacts from floods, droughts and storms to sea level rise and salinization, which are inflicting L&D in communities worldwide. The discussion on adaptation and L&D originates from the growing agreement among scientists that there is high probability of global average temperature crossing 2 degree centigrade threshold beyond which climate change could have devastating impacts outweighing the mitigation and adaptation actions taken and planned thus far. At least two factors stand out clearly for the residual impacts; one is the inability of the global community to plan and implement sufficient adaptation measures at scale, place and time they are needed and secondly the failure of adaptation practices even if it is not universal suggesting that there is a limit to which adaptation can take place. Failure of some of the adaptation practices is not surprising and can be visualised even in the current climate, as in areas where farmers adapt new crop varieties to withstand a known climatic hazard and soon crops become vulnerable because the thresholds have shifted. This signifies that one should expect high possibilities of unavoidable damages despite planned mitigation and adaptation practices based on known climate change impacts. The IPCC 4th Assessment Report clearly indicate that limits to adaptation can happen both in developed and developing countries though problem in developing countries could be exacerbated due to underlying vulnerability factors. Much of the residual losses are also due to the fact that there is limited understanding on how climate change impacts will actually manifest on the ground and uncertainty in projecting the nature and degree of impacts. Recognising and considering adaptation and L&D into planning strategies is vital for making adaptation effective and sustainable. This entails greater understanding on the nature of adaptation and L&D emanating from climate change which has largely to do with methodologies adapted to measure and estimate climate change impacts and dealing with adaptation and L&D through building capacities at various levels which includes establishing support mechanisms such as networks and strengthening relief and response measures and risk spreading instruments.

A work programme on adaptation and L&D was established in 2010 at the 16th Conference of the Parties (COP) in Cancun to enhance understanding of adaptation and L&D and approaches to address it in developing countries. Further to these efforts, at COP 18 in Doha in 2012 Parties agreed to establish institutional arrangements to address adaptation and L&D under the UNFCCC at COP 19 later this year in Warsaw. Leading up to that decision the UNFCCC will commission technical papers on non-economic losses and institutional arrangements as well as an expert workshop on approaches to address slow onset events.

The preliminary review of current discussions on adaptation and L&D in several global workshops revealed a gap in perceptions between developed and developing countries on aspects related to financing and institutional arrangements to address adaptation and L&D. The adaptation and L&D debates argue that both mitigation and adaptation should be increased and scaled up (through more support for adaptation), to reduce the residual L&D. There are a lot of questions around where adaptation lie vis-a-vis L&D, which this conference aim to explore bringing latest understanding on this topic and identify a way forward.

OBJECTIVES AND EXPECTED OUTCOMES

Keeping the above background in view, the APAN organised an International Conference on “Adaptation and Loss and Damage associated with Climate Change in the Asia-Pacific Region: Integrating Scientific Aspects” with a view to share the scientific knowledge and information to enable policy makers to make informed decisions based on the available science and to provide a platform for discussion for scientists, policy makers, community organisations and the general public. The conference addressed the following questions related to the adaptation and L&D:

1. What are limits and barriers to adaptation?
2. What is the scientific understanding on adaptation and L&D?
3. What challenges and opportunities lie ahead in governing adaptation from the view point of risk management?
4. What adaptation and L&D related lessons can we learn from the recent major climatic events?
5. What are slow onset impacts of climate change and how to tackle with them?
6. What are the technical, institutional and capacity measures required to deal with adaptation and L&D?

The expected outcomes of the conference were: a) promoting shared understanding on the issue of adaptation and L&D among various stakeholders and b) identifying and addressing major stumbling blocks in the discourse of adaptation and L&D.

KEY QUESTIONS TO BE ADDRESSED

SESSION I: FRAMING PRESENTATION/WELCOMING REMARKS

- Why are we getting together here?
- What challenges do we face in terms of residual impacts of climate change?
- What do we want to take home by the end of this event?

SESSION II: LIMITS AND BARRIERS TO ADAPTATION

- What are the scientific, social, institutional and regulatory limitations for adapting to climate change?
- How these limits have been overcome so far and how they play a role in the future?
- What do these limits mean for effective adaptation and residual losses and damages attributed to climate change?

SESSION III: SCIENTIFIC UNDERSTANDING ON THE ISSUE OF ADAPTATION AND L&D

- What is the climate-science related origin of adaptation and L&D associated with climate change?
- What are the exact gaps in using the available climate information for future impact assessments and how these gaps can be overcome?
- How to address the uncertainty issue involved in climate projections so that the available climate information can be effectively used for decision making?
- Will designing and delivering climate information tailored to the end-users enhance the proper climate information use?
- What all the above means for designing and implementing effective adaptation strategies?

SESSION IV: IMPLICATIONS OF ADAPTATION AND L&D TO GOVERNING ADAPTATION

- What are the medium and long-term implications of accepting certain losses and damages for governing adaptation?
- Can existing climate risk management solutions be sufficient or new and innovative solutions need to be designed to bridge the gap of adaptation and L&D?
- What is the role of financial tools in managing adaptation and L&D?

SESSION V: ADAPTATION AND L&D LESSONS FROM RECENT EXTREME EVENTS

- How the recent extreme events have undermined the stringent mitigation, response and relief measures put in place on the ground?
- What DRR and adaptation measures have failed and why?
- How various governments and relief agencies have reconciled the surprise factor involved in these extreme events?
- What important lessons can we take forward from these events to prepare and respond to the losses and damages associated with climate change?

SESSION VI: UNDERSTANDING AND TACKLING SLOW ONSET IMPACTS OF CLIMATE CHANGE

- What are the slow onset impacts associated with climate change?
- What makes slow onset impacts difficult to manage compared to the rapid onset impacts?
- How small islands and developing states are particularly vulnerable to these slow onset impacts of climate change?
- What solutions do we know to address the slow onset impacts and how much more we need to know?

SESSION VII: COMMUNITY ORGANISATIONS FOR DEALING WITH ADAPTATION AND L&D

- What are the implications of residual impacts of climate change to various community organisations?
- Would L&D be a demotivating factor for community organisations or it calls for their renewed interest in their fight against climate change?
- What the information needs of community organisations are for better able to deal with the adaptation and L&D?
- How planning at various levels can handle the issues of adaptation and L&D?
- What are the current strengths and weaknesses in the existing institutional capacities at community level to deal with adaptation and L&D?

SESSION VIII: WAY FORWARD FOR DEALING WITH L&D

- How various stakeholders can closely collaborate to address the issues of adaptation and L&D?
- What are the take-home messages from the perspective of social resilience point of view?
- How national policies can facilitate addressing the issues of adaptation and L&D?
- How corporations can help address the issues of adaptation and L&D?
- How bi- and multi-lateral donor agencies can contribute to addressing the issues of adaptation and L&D?

SESSION IX: CLOSING REMARKS

- What did we learn here?
- Where do we want to go from here and what more to do?

AGENDA

Day I: 30th Aug 2013

Time	Session details
8:30-9:00	Registration
9:00-10:00	<p>Session I: Inaugural and framing session</p> <p><i>Chair: Mr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP</i></p> <ul style="list-style-type: none"> • Welcome address- Dr. Young-Woo Park, UNEP • Mr. Hiroshi Tsujihara- Ministry of The Environment, Government of Japan • Keynote speech-Overview on adaptation and L&D: Dr. Saleemul Huq, ICCCAD, Bangladesh
10:00-10:30	Tea break
10:30-12:30	<p>Panel session II: Limits and barriers to adaptation</p> <p><i>Chair: Dr. Nicholle Koko Warner, UNU</i></p> <ul style="list-style-type: none"> • Risk based analytic framing for limits to societal adaptation: Prof. Kirsten Dow, University of South Carolina • Why adaptation may fail (or barriers to adaptation or lessons from maladaptation)? Mr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP • Humanitarian aspects of limits to adaptation: Prof. Doreen Stabinsky, College of the Atlantic • Limits in urban adaptation: Dr. Gorden Kemmery Lowry, East West Centre
12:30-13:30	Lunch Break
13:30-15:00	<p>Session III: Scientific understanding on the issues of adaptation and L&D</p> <p><i>Chair: Dr. A. Subbiah, Regional Integrated Multi-Hazard Early Warning System (RIMES)</i></p>

Time	Session details
	<ul style="list-style-type: none"> • Methodological gaps related to climate change impact assessments at global, national and sub-national levels: Dr. Koji Dairaku, NRIESDP • Limitations in assessing economic and non-economic damages from L&D: Dr. Sitanon Jesdapipat, Rangsit University • How can climate services help to estimate losses, damages and adaptation costs? Prof. Dr. Kropp Peter Jurgen, Potsdam Institute for Climate Impact • What makes it difficult to predict extreme climate events in the long time scales? Prof. Monirul Mirza, University of Toronto • APN activities on Climate Change Adaptation, Disaster Risk Reduction and Loss & Damage, Dr. Linda Anne Stevenson, APN
15:00-15:30	Tea break
15:30-17:00	<p>Session IV: Implications of L&D to climate risk management: What challenges and opportunities lie ahead in governing adaptation</p> <p style="text-align: right;"><i>Chair: Dr. Saleemul Huq, ICCCAD</i></p> <ul style="list-style-type: none"> • Implications of L&D for adaptation planning: Dr. Soojeong Myeong, KACCC, KEI • Innovative risk financing approaches: Prof. M.A. Baqui Khalily, Institute for Microfinance • Disaster inventories and their role in damage and loss assessment: Mr. Rajesh Sharma, UNDP AP Regional Center • Climate risk management approaches for reducing L&D: Dr. A Subbiah, Regional Integrated Multi-Hazard Early Warning System (RIMES) • Role of catastrophic risk insurance in reducing L&D: Dr. Nicholle Koko Warner, UNU
17:00- 17:30	Wrap up

Day II: 31st Aug 2013

Time	Session details
9:00-10:30	Session V: What adaptation and L&D related lessons can we learn from recent extreme events?

Time	Session details
	<p style="text-align: right;"><i>Chair: Dr. Bhichit Rattakul, ADPC, Bangkok</i></p> <ul style="list-style-type: none"> • What can we learn from past adaptations to extreme events? Dr. Adriana Keating, IIASA • Lessons from Thailand 2011 floods: Specific implications for response and relief. Dr. Apichart Anukulampai, President, TWRA • Lessons from Philippines 2012 typhoon Bopha: Specific implications for early warning): Ms. Rosalina de Guzman, PAGASA • Lessons from Bangladesh 2012 floods: Specific implications for livelihood restoration, Prof. Ainun Nishat, BRAC • Lessons from Japan Earthquake and Tsunami 2012: Specific implications for financing relief and reconstruction: Dr. Yoshio Kajitani, Central Research Institute of Electric Power Industry
10:30-11:00	Tea break
11:00-12:30	<p>Session VI: Understanding and tackling slow onset impacts of climate change</p> <p style="text-align: right;"><i>Chair: Prof. Poh Poh Wang, University of Adelaide</i></p> <ul style="list-style-type: none"> • Characterising and addressing slow onset climate change impacts on biodiversity: Ms. Isabel Kreisler Moreno, ROLAC • Learning adaptation and L&D related lessons from the past extreme droughts in Africa: Prof. Emeritus Richard Samson Odingo, University of Nairobi • Slow onset events and small island states: Mr. Terieta Tekiera Mwemwenikeaki, Republic of Kiribati • Range of approaches currently being practiced that can address adaptation and L&D in SIDS: Mr. Soenke Kreft, Germanwatch • Climate change induced sea level rise and coastal salinisation: Dr. Ahsan Uddin Ahmed, Centre for Global Change
12:30-13:30	Lunch break
13:30-15:00	<p>Session VII: Community organisations for dealing with adaptation and L&D</p> <p style="text-align: right;"><i>Chair: Dr. Charles Rodgers, ADB</i></p> <ul style="list-style-type: none"> • Key note speech: Implications of L&D to planning and implementing community based adaptation: Dr. Saleemul Huq, ICCCAD • Follow up discussion: <ul style="list-style-type: none"> ○ Experiences of community organisations from humanitarian point of view: Mr. Harjeet Singh, Action Aid Int.

Time	Session details
	<ul style="list-style-type: none"> ○ Implications of adaptation and L&D to natural resource management and eco-system based adaptation: Mr. Sanjay Vashisht, CANSA ○ Information needs for decision making at the local level and current gaps: Mr. Aarjan Dixit, CARE ○ Role of local adaptation plan of actions in dealing with L&D: Mr. Mihir Bhatt, AIDMI
15:00-15:30	Tea Break
15:30-17:00	<p>Panel session VIII: Way forward for dealing with the adaptation and L&D: Specific stakeholder messages</p> <p style="text-align: right;"><i>Chair: Prof. M. Watanabe, Keio University</i></p> <ul style="list-style-type: none"> ● Way forward from the science perspective, Prof. YAN Wanglin, Keio University ● Role of donor agencies in promoting the work on adaptation and L&D, Dr. Charles Rodgers, ADB ● Way forward from the perspective of governments, Dr. Monthip Sriratana, Royal Institute of Thailand ● Private sector perspectives, Dr. Michinori Kutami, Fujitsu Ltd. ● Knowledge networks and information sharing, Mr. Ali Tauqeer Sheikh, CDKN/ LEAD ● Role of research community to address adaptation and L&D associated with climate change, Dr. Akio Takemoto, APN
17:00-17:30	<p>Session IX:</p> <p>Closing remarks, IGES</p> <p style="text-align: center;">Mr. Hideyuki Mori, Executive Director and President, IGES</p> <p>Closing remarks, UNEP</p> <p style="text-align: center;">Mr. Mozaharul Alam, Regional Climate Change Coordinator, UNEP</p>

PROCEEDINGS: DAY I

SESSION I: THE KEY NOTE SPEECH

- 1) **Keynote Speech:** Dr. Saleemul Huq set the overall context and concepts related to adaptation and L&D with clear distinction between loss and damage, how they may differ between different countries, what experiences we have in dealing with them and what it means for negotiations under the UNFCCC. He made three distinct points: L&D is nothing new, something we are used to, explained how the L&D is new and what it means to take forward the debate under UNFCCC, and that there is much to be done on L&D in terms of knowledge generation based on experiences from DRR and CCA.

SESSION II: LIMITS TO ADAPTATION

- a) **Risk based analytic framing for limits to societal adaptation:** Dr. Kirstin Dow introduced the concepts related to acceptable risks, tolerable risks, and intolerable risks¹ and hypothesised that what is tolerable and intolerable varies between cultures and communities. She emphasised that limits to adaptation is reached when an actor is no longer able to / unable to secure benefits from adaptive actions to deal with intolerable risks.
- b) **Why adaptation may fail:** Mr. Mozaharul Alam emphasised the dynamic nature with which different factors and actors interact and hence it is very difficult to pin point when and where a limit to adaptation is reached. He explained his hypothesis using a baseball analogy. He stressed that constraints and opportunities determine when a limit to adaptation is reached and that they have tendency to balance each other. He opined that the limits to adaptation tend to be reached much faster at the local level than at higher levels due to capacity limitations at the local level.
- c) **Humanitarian aspects of L&D:** Prof. Doreen Stabinsky concentrated her intervention on the humanitarian and human rights perspectives and stressed the need for a shift in debate from a humanitarian perspective to a human rights perspective in addressing the adaptation and L&D. She reiterated the need to forecast reaching limits to adaptation and the need for all stakeholders to understand the concept of limits to adaptation. As a way forward, she asked researchers to make progress in identifying and

¹ According to Dr. Dow, the tolerable risks are those risks deemed so low that additional risk reduction efforts (adaptations) are not seen as necessary. Tolerable risks relate to activities seen as worth pursuing for their benefits, but where additional efforts (adaptations) are required for risk reduction within reasonable levels. Intolerable risks are those which exceed a socially-negotiated norm (e.g., the availability of clean drinking water) or value (e.g. a persistence of a way of life) despite adaptive action.

anticipating limits to adaptation and for policy makers to understand these limits. She reiterated four entry points to address adaptation and L&D: understanding and addressing the risk of slow onset events, non-economic L&D, how L&D associated with CC effects people that are already vulnerable and how CC is impacting the human migration.

- d) **Limits to urban adaptation:** Dr. Kem Lowry made his intervention based around the experience he had in designing the adaptation plan in Hawaii. He opined that despite presence of vast amount of data and technical knowhow, the scientific communities had difficulty to pinpoint future climate impacts with the certainty that policy makers need for informed decision making. He stressed the need for formation of epistemic communities that help translate scientific information and help policy makers take decisions with best possible information at their disposal.

SESSION III: SCIENTIFIC UNDERSTANDING OF ADAPTATION AND L&D

- a) **Methodological gaps in impact assessments:** Dr. Koji Dairaku explained the possibility of using both top down and bottom up approaches of climate change impact assessments. He explained that Research Program on Climate Change Adaptation project was able to develop regional climate simulation using LULUC scenarios and this information was in turn used to develop adaptation model on water related vulnerability. He further explained the structural and parametric uncertainties in models and the possible consequences of the same for adaptation decision making. He stressed the need for developing robust socio-economic models consistent with the CC models.
- b) **Limitations in assessing economic impacts:** Dr. Sitanon Jesdapipat reasoned that the adaptation and L&D has its origin within the principles of UNFCCC such as precautionary and polluter pays principle. He stressed that there exists a gap between time scales in which development decisions are made and time scales at which CC impacts appear. He opined that there is a lot that can be done using the knowledge with certainty and that the debate on uncertainty shouldn't hijack the process.
- c) **Role of climate services:** Dr. Kropp Peter Jurgen explained the research on economic incentives of adaptation and L&D as it could help in designing effective policies and prioritise actions and that climate services can effectively contribute in achieving these benefits. He stressed that the major limitation with the quantitative methods is the difficulty in assessing the damage function. He showed that every system has certain amount of unresolvable uncertainty and explained how Reconciling Adaptation, Mitigation and Sustainable Development for Cities (RAMSES) project is helping in combining different models to reduce the uncertainty in risk assessments.
- d) **Why projecting extreme events is difficult:** Dr. Monirul Mirza made a case of why it is difficult to predict extreme events by taking the example of extreme rainfall event of

Toronto in July 2013 that broke the 60-year record. When the probability function of rainfall was fitted using historical data, it revealed that this event has changed the return period from 154 years to 87 years with double the probability with which an event of similar magnitude could occur. He explained that the climate models are based on complex interaction between different parameters on which there is limited understanding leading to uncertainty in projections. The current models are good in predicting temperatures more than precipitation since precipitation is influenced by local factors as well. He also emphasised that part of the problem is with the gaps in the historical data, and limited resolution at which global climate models operate.

- e) **Asia Pacific Network for Global Change Research (APN) Science Agenda:** The session ended with Dr. Linda Anne Stevenson presenting the work by the APN over the decade. The Network has successfully funded and produced valuable outputs in the field of CCA and DRR. The work streams included such as CaPaBle program, work related to UNFCCC SBSTA, and vulnerability assessments and science-policy dialogues. She invited the participants to submit proposals to a stream of funding that APN has initiated specifically addressing adaptation and L&D.

SESSION IV: IMPLICATIONS FOR RISK MANAGEMENT

- a) **L&D Implications for adaptation:** Dr. Soojeong Myeong laid out five stages in which adaptation planning takes place and explained major limitations and barriers at each stage. Most common barriers along the continuum of adaptation decision making include lack of scientific information and awareness for making appropriate decisions, capacity limitations, limited adaptation practices, technological limitations, financial limitations, institutional barriers and difficulty in developing M&E indicators. She opined that many of these limitations could be overcome by identifying synergies between CCA and DRR. She gave several examples that have similar synergies including green roofs and porous pavements.
- b) **Role of microfinance:** Dr. Baqui Khalily explained how microfinance could help communities build resilience and address the issues of adaptation and L&D in Bangladesh. He presented the results of a recent survey conducted on how communities look at the value of microfinance (MF). The survey revealed that those who enrolled in microfinance programs were able to recover while those who have not enrolled in any kind of microfinance are yet to recover from the recent disaster. He explained that the microfinance institutions in Bangladesh have diversified their portfolio of products and are now able to issue insurance coverage to livestock, liability insurance and index based insurance. He concluded by saying that the field of microfinance is continuously innovating and growing and hence is dynamic in nature, one can look forward to innovative MF products in the years to come that could address the potential losses and damages associated with climate change.

- c) **Role of disaster Loss and Damage inventories:** Mr. Rajesh Sharma stressed the need for systematic recording of disaster losses for proper analysis and inference. In the absence of this, there has been a gap in our understanding of how disasters impact lives and livelihoods historically. Recognising the need, UNDP has embarked upon establishing the Disaster Loss and Damage database in 50 countries and 57 sub-regional and regional databases with a common framework, he explained. These databases are now helping ascertain the interaction between disasters and poverty, long term trends and policy effectiveness. He stressed the need for institutionalising the databases through developing ownership within the government and avoiding duplicity.
- d) **Climate risk management approaches:** Dr. Arjunapermal Subbiah pointed out that the climate risk management approach considers synergies between CCA and DRR. He showed that a one USD investment in early warning by 3-4 days will return 12 USD in terms of benefits. Returns per investment in case of early warning by 5-10 days is 44 USD per dollar invested. He stressed the need for assessing losses from both the episodic high impact events and non-episodic events.
- e) **Risk insurance:** Dr. Nicholle Koko Warner urged to look at the insurance mechanisms not as a way of payment mechanism but as those that drive transformation in risk reduction. She explained five important benefits that risk insurance could provide including addressing barriers to adaptation through a mix of approaches to manage and reduce risks, incentivise loss reduction and resilience building, assess adaptation and L&D potential, reduce financial repercussions of volatility and create more space for certainty in decision making, and provide timely finance to cover adaptation and L&D. She identified various means through which these functions could be achieved with examples from the community level.

PROCEEDINGS: DAY II

SESSION V: LESSONS FROM PAST EXTREME EVENTS

- a. **Lessons from past extreme events:** Ms. Adriana Keating stated that the economic methods can influence the outcomes of CCA and DRR. Only recently that the improved understanding on human dimensions of disasters has led to thinking about reducing the exposure leading to structural measures such as use of dykes etc. acting as a barrier between the sea and the people. As a result, issues like ‘the levee effect’ exemplified the maladaptation as it increased the false sense of security leading to building up of the structures behind the levees. She stated that there is lot of significant and intangible impacts from catastrophes that are not captured by the traditional analytical procedures. She informed that the resilience thinking provides interconnections between CC and other challenges, and helps in evaluating trade-offs. In terms of economic tools, the optimisation tools may have room but need robust methods beyond these. In a scenario of large solution uncertainty, innovative and adaptive management works well along with the portfolio management. Under low problem uncertainty, optimisation methods work and at high problem uncertainty the robust methods work well, she hypothesised.
- b. **Thailand floods, 2011:** Dr. Apichart Anukularmphai stated that the floods of 2011 took a big toll on Thailand, several human lives were lost and trillions of dollars in economic damage. During 2011 floods 18 industrial estates were flooded as they were located in the flood plain. The unusual rainfall, poor management and infrastructure made the disaster an extreme one. On top of CC, these impacts have exaggerated the problem, he opined. He reported that the new urban development has undermined many nature principles including occupying the flood plain that led to the disaster. He outlined the following for better DRR: more observation stations to monitor, comprehensive information system and decision making, need for responsive and well prepared institutional mechanisms, increase the resilience of human and infrastructure systems, change of mind set among planners and policy makers, educating the public on aspects of irrigation and flood management, erecting flood protection walls and moving towards integrated basin approaches, and supplementing engineering approaches with social approaches.
- c. **Typhoon Bopha, Philippines:** Talking about the Philippines experience with typhoons, Dr. Rosalina Guzman informed that the repeated disasters have resulted in diversion of resources, meant for development, for reconstruction and rehabilitation. Explaining the case of typhoon that hit Philippines in 2012, she informed that the high impacts were due to Mindanao being rarely visited by tropical cyclone as it is near the equator and that the local administration were not well verse in dealing with such disasters. For the 2012 cyclone, the early warning was given by the meteorological agency as early as in Nov 20

2012 and it was forecasted to move in a particular direction and to make landfall on 4th Dec. Typhoon Bopha turn out to be the strongest in the last 60-100 years. The post-disaster consultations found that local communities did not respond to early warning due to lack of understanding/awareness as they had never experienced a typhoon of the scale of Bopha. She found the need for preparing the local government units as the first line of response by improving their capacities and for establishing improved communication channels including early warning equipment.

- d. **Bangladesh floods 2012:** Prof. Ainun Nishat stated that intense floods and low rainfall has been the perennial situation in Bangladesh and informed the audience about changing patterns of rainfall and hailstorms over the years. Explaining about the 2012 floods, he indicated that the river management authorities on the Indian side have not made efforts to communicate the flood management decisions taken to the authorities on Bangladesh side. In addition to the floods, he indicated that the coastline is moving inland so is the salinity which has been making the drinking water saline. He has outlined various measures that local people are taking including switching the cultivation from rice to maize, irrigating the crops in the peak of monsoon, introduction of new varieties that are salt and flood tolerant. He opined that there is very less support given to farmers to adapt to climate change as a result of which farmers are left on their own.
- e. **Lessons from Japan earthquake:** Dr. Yoshio Kajitani opined that the great East Japan earthquake though happened in 2011 is still an ongoing disaster. According to him, the lessons from this disaster have several implications for the adaptation community. He explained that the multiple impacts from earthquake, tsunami and nuclear emergency have made the situation worst and has led to large scale socio-economic damage. Explaining the financial losses from the disaster, he informed that the amount required exceeds the financial resources available and most of the money has been raised from bonds which need to be repaid for a long time in the future. He identified the lack of capacity with the local governments to spend the entire money and especially the case with the heavily damaged prefectures where large proportion of budget remain unspent. He explained issues with the public procurement process and lack of locally available skilled labour including construction workers which has led to increased cost of reconstruction. He informed about a situation where people who wanted to abandon low-lying areas and move to higher areas while the government wanted to retain them by building dikes.

SESSION VI: SLOW ONSET EVENTS (SOE)

- a. **Impacts on biodiversity:** Ms. Isabel Moreno explained the cumulative impacts of slow onset events (SOEs) on biodiversity, structure and function of ecosystem, and ecosystem services which could lead to reduction of ecosystem resilience and capacity to bounce back. Further, she stressed that the less biodiversity means increased

vulnerability due to reduced gene pool. Ms. Isabel felt that what is being lost is unknown and that there is a scope to address this gap through research. She opined that non-economic losses make it even more difficult to manage as biodiversity and ecosystem values cannot be monetised and market mechanism doesn't work well due to lack of monetisation. She stressed that Small Island Developing States (SIDS) and developing countries are particularly vulnerable to biodiversity loss due to ecological factors including degree of adaptability of ecosystems, endemic species in SIDS, and the already disturbed ecosystems. She concluded highlighting the need to develop biodiversity inventory and databases, adaptation baseline and indicators, ecological thresholds and ecosystem resilience and potential opportunities to restore resilience.

b. Droughts in Africa: Prof. Richard Samson Odingo started his speech by saying “I don't know what is lost and what is damaged when so many people die!” He outlined the climate change vulnerability in Africa and indicated that the CC is not well studied in Africa. He opined that the climate change adaptation practices being talked about in the forum have been in existence for several decades. He stressed that tools such as insurance may not work well when the whole country and the entire continent is facing the drought and that there is no easy route to adaptation for these countries. He invited the scientific community to understand the complex patterns such as droughts and their association with the mass movement of population. Talking about the need for improving early warning, he indicated that it has only limited influence in dealing with particular season and drought types and to prepare the farmers well in advance. He indicated that bad governance and internal conflict could undermine the adaptation efforts as in the case of Somalia drought where absence of government made the distribution of relief material a challenge.

c. Climate change and Small Island Developing States (SIDS): Mr. Terieta Mwemwenikeaki informed the audience that the climate change is a problem to everybody but the question relevant for the Small Island Developing States (SIDS) is the availability of alternative options. He opined that, for a small island such as Kiribati, the issue of CC is how to sustain life on the island for as long as possible, while addressing the question of sovereignty. Though the impacts of climate change may come in 15-20 years, people are living with CC impacts even today which will only increase in the future, he stressed. He outlined several policy provisions by the government focusing on adaptation. Indicating that the issue of lack of knowledge on extreme SOEs pose challenges in planning policy and decision making, he called for support from the global governance of adaptation under UNFCCC. He explained that the government of Kiribati has started working on the *whole of island approach* so that interventions from different donors can have impact on reducing the impact.

d. Sea level rise: Prof. Ahsan Udding Ahmed listed several indicators related to assessing the impacts of sea level rise (SLR) and related adaptation practices. He indicated that the

movement of isohaline, soil salinity up to the crop root zone, and drinking water unsuitable for human and animal consumption are important ones for assessing the impacts of salinisation. Listing several adaptation practices, he indicated that they all have financial implications. The presentation lists many infrastructure options but limited social and biological options. Prof. Ahmed reiterated that there is still scope to adapt and that not all opportunities are lost. While agreeing on the need for incremental adaptation, he stressed that the issues such as sovereign rights on land cannot be easily addressed.

- e. **Range of approaches for SIDS:** Mr. Sonke Kreft started his presentation by defining SOE as events that evolve gradually from incremental changes occurring over many years or from an increased frequency or intensity of recurring events. In this context, he explained that the limit to adaptation is related to managing tipping elements of social, economic and policy uncertainty of un-avoided climate change. He stressed the need for moving to transformational responses which could differ with incremental adaptation actions by scope, location and type/newness of the action. Referring to the adaptation markers project database with 3139 projects, he stressed that the ocean acidification could be a significant threat as there are no adaptation actions to address ocean acidification. As reflected from the policy documents, he thought that there are indications for early transformatory adaptation in the form of population resettlement, economic diversification, survivability and self-reliance. He quoted Kiribati proposal to buy acres of land in Fiji to grow food products for Kiribati as a transformatory option for SIDS. He concluded by saying that there is very little evidence for addressing policy uncertainty of un-avoided climate change and that there is a need for research, policy and implementation agenda to address SOE of adaptation and L&D.

SESSION VII: COMMUNITY ORGANISATIONS

- a. **Keynote speech:** Dr. Saleemul Huq characterised the communities as the most vulnerable people on the planet and that they don't have voice in UNFCCC in proportion to the number they represent in most countries. He stressed that some poor doesn't need to be vulnerable and all vulnerable may not be poor. Further elaborating on the characteristics of poor and vulnerable people, he reiterated that they are not the ones who causing the climate problem. He debated that there is a moral issue as for who these people are and how they are responsible for climate change problems. Further, he informed the audience that the poor live in fragile ecosystems such as low lying coasts, many poor accept the intolerable and live in places they know they will die when cyclone comes, and they don't have lot of choices and giving them more choices is important so they have a positive future. He concluded by stressing that the L&D community has not yet grasped the issues of these communities for addressing the adaptation and L&D.
- b. **Vulnerability assessment:** Mr. Harjeet Singh informed that the Action Aid is an anti-poverty agency located in Johannesburg and that it has been engaged in vulnerability

analysis at the ground level for several years. He informed that the community engagement involves reflection action process, which assumes that communities have knowledge and that there is a need for knowledge exchange between communities and intervening agencies. He stressed that such exchange is possible only by putting people at the centre and then by trying to understand what is making them vulnerable. He stressed that issue such as social exclusion from decision making process at home and outside made communities vulnerable. Lack of skills, lack of economic opportunities and lack of access to natural resources made them even more vulnerable. He opined that unequal and unjust power (power to participate, power to skills etc.) is the reason behind social exclusion and that the outcome of any engagement process with communities has to be empowerment such that communities manage risks using the capacities gained.

- c. **Natural resources and L&D:** Mr. Sanjay Vashist found that adaptation and L&D implications on natural resource could be very fearsome. He questioned about the implications of permanent loss of natural resources as natural resources provide ecosystem services and drive local economy by supporting livelihoods. He identified that permanent losses are happening in terms of growing desertification in south Asia and elsewhere. Identifying the linkages between depleting natural resource base and communities, he warned that permanent losses could lead to conflicts within communities. As a way forward, he called for prioritising the role of natural resources in terms of products and services and stressed the need for conservation as a best option for ecological services.
- d. **Information needs at local level:** Mr. Aarjan Dixit informed that CARE's recent work in Africa has helped in increasing resilience and adaptive capacity. Informing that CARE follows the rights based approach and addresses adaptation and L&D as a question of fundamental climate justice. He opined that lack of information itself is not the barrier and that there are host of issues that determines whether lack of information increases the vulnerability or not. Characteristics such as accuracy, accessibility, regular update and target oriented etc. determine its contribution to vulnerability. Given the large information requirement for adaptation decision making, he opined that it is a challenge to integrate the information to provide solutions. Explaining about Climate Vulnerability and Capacity Assessment (CVCA) tool that has been applied in CBA projects in 20 countries, he informed that the tool has helped in addressing local impacts and allowed to work with communities to understand local and context specific information needs. Enlisting the lessons learned, he stressed the fundamental importance to address local issues and that there is a need for a nuanced approach as poor may not always be vulnerable and vulnerable may not be poor.
- e. **Role of local adaptation plans:** Mr. Mihir Bhatt reviewed several local disaster risk reduction plans and provided pertinent implications for addressing adaptation and L&D. Explaining the role of local adaptation plan of actions in dealing with adaptation and

L&D, he elaborated on the review of state and district level disaster management plans in India. He explained that the action plans were drawn at 4 level: Family level, area plans at district and projects for adaptation and for integrating DRR into CCA. He informed that out of plans of 22 district disaster management plans reviewed, L&D to growth of domestic/household economy was found to be far more important than the L&D to assets.

SESSION VIII: WAY FORWARD

- a. **Science perspective for resilience:** Prof. Wanglin Yan, as a way forward, explained about the early warning system in Mongolia for herders to adapt to climate change. He explained that the data is only in the books but people who need it doesn't have it and that there is a need to bridge the gap. For doing so, he thought that integrated information system can be important and tools such as mobile phones etc. could be useful depending on how the message is delivered and used. He stressed that only context specific information can be used by local people. Observing that communities can autonomously adapt to annual changes but can't adapt to extreme cases, he explained the importance of social resilience in adapting to extremes. He stressed that the local communities could be tolerant to disasters due to their access to indigenous knowledge when compared to urban people. Stressing that adaptation and L&D are issues of equity, he called for transform mind sets and to move to green economy with natural capitalism.
- b. **Multi-lateral development finance:** Dr. Charles Rodgers informed the audience that ADB has not yet formally adopted a position on the issue of L&D and hence the presentation is his own perspective. He laid out three choices: adapt, mitigate and suffer and opined that we are already committed to some level of suffering as inevitable. Indicating that mitigation and adaptation are our primarily lever to influence adaptation and L&D associated with slow onset impacts, he explained how Climate Policy Initiative can provide data on finance. Further, he explained about the current situation of climate finance and how they are insufficient, unpredictable and fragmented. Stressing the need for risk retention, transfer and mitigation, he indicated that the primary role of financial institutions is to support adaptation and resilience building to minimise L&D and keep balance with development agenda which is an unfinished agenda. He called for using cost effective options such as using local resources. The big problem, he found, is still lack of knowhow to put a portfolio that makes use of all the resources in an effective manner.
- c. **Government perspective:** Dr. Monthip Sriratana explained how the Thailand government is dealing with the CC and DRR. She explained about the National Committee that was established to form national disaster prevention and mitigation mechanism. Explaining that Thailand is in the process of developing DRR approach as a strategy for dealing with adaptation and L&D, she called for systematic integration of

disaster risk reduction into development which remained a challenge and to strengthen early warning and preparedness. Explaining that the Thai government has started offering insurance since 2013 and that all the farmers are encouraged to join due to disaster losses; she raised the question of sustainability of the insurance program due to the costs to be incurred by the government. She indicated that the government is coming up with climate change research program with funding under research strategy to avoid duplication and to work on climate change research and to convert research into action.

- d. **Role of private sector:** Dr. Michinori Kutami felt that at least three key innovations are needed for adaptation: advanced technologies, new market mechanisms and social/financial systems. Explaining about Information Communication Technologies (ICTs), he stressed that the essence of technology is efficiency improvement, dematerialisation, analysis and simulation, prediction, warning and sharing of information. He explained that ICT can be used for information collection, monitoring, ecosystem surveys, wildlife surveys etc. which are required in adaptation planning and L&D as well as for evacuation as shown in case of Bangladesh and Thailand. He explained about the green ICT project, named “Green Policy Innovation,” launched by the Fujitsu group, for reducing society environmental burden and reducing society impacts of CC. Indicating that the prediction of tsunami can help prevent loss of lives, he explained about collaboration between Tohoku University and Fujitsu in developing a 3D simulation using super computers (K Super Computer). He elaborated on a host of other technologies employed for decision making including disaster simulation for resilient society, flood reduction by weather forecasting and simulation, reducing productivity decrease of rice using the harvest and protein maps, and sensors for sensing temperature and humidity for keeping the quality of grapes.
- e. **Role of networks and information sharing:** Mr. Ali Tauqeer Sheikh summarised what he had learned in the event. He talked about the little experience of addressing slow onset disasters and opined that non-economic costs are tangible and that one doesn't have a catalogue of what they are. He explained that environmental degradation is irreversible, baselines are indicative where they exist, opportunity costs are far from understood, science is not from policy and policy processes are happening independent of practices on the ground, practices on the ground are happening autonomous and in most instances are not feeding into policy processes. Talking about communities, he indicated that migration may be happening in Asia at rapid rate due to heavy depletion of natural resources leaving behind the most vulnerable. As a way forward, he stressed the need for downscaling knowledge for L&D and CCA to varied audience and simplification of knowledge on L&D.
- f. **Role of research communities:** Dr. Akio Takemoto informed the audience regarding the vital role that APN has been playing in providing a link between science and policy. He outlined the outcomes of the workshop that the Network had conducted in Kobe in

August 2013 and announced the call for proposals for expanding the mandate on adaptation and L&D.

- g. **Closing Remarks:** Concluding the session, Prof. Masataka Watanabe called for climate compatible development with adaptation, mitigation and development integrated into it. He observed that Bangladesh has emerged as a key case study country with several cases presented in the conference and expressed the need for these experiences be shared widely. He outlined four ways that emerged out of the adaptation and L&D conference: Disseminating the emerging research findings from Bangladesh which has become a ‘department store’ of exercise and research in DRR and slow onset events, expanding good cases of adaptation practices into sub-regions and sub-sectors, sharing knowledge and data among stakeholders and greater support to adaptation and L&D research in the form of APN-led adaptation activities.

SPEAKER PROFILES

Aarjan Dixit (Mr.)

Mr. Dixit is the Climate Change Regional Coordinator for Asia for CARE-International's Poverty Environment and Climate Change Network (PEECN). Mr. Dixit's work includes increasing and improving the quality of climate change programming in CARE-International members and country offices in Asia, increasing learning from on-going climate change projects for CARE, and engaging in national and international advocacy. CARE is one of the world's leading non-governmental relief and international development organisations working in 84 countries. CARE puts social justice and gender equality at the forefront of its work toward resilience for the poorest and most vulnerable women, men, boys and girls, with particular focus on integrating community-based adaptation into risk reduction, food and agriculture programming, and linking this with policy and advocacy for climate justice at national and international levels.

Adriana Keating (Ms.)

Ms. Keating is a Research Scholar with the Risk, Policy and Vulnerability (RPV) program at the International Institute of Applied System Analysis (IIASA). Her academic career has focused on development economics as well as political science and human geography. She joins IIASA from the position of Research Economist at the Centre for Risk and Community Safety at RMIT University, Melbourne Australia. Previous to this Ms. Keating was an economist at the Australian Agency for International Development (AusAID), specialising in gender in development assistance. Ms. Keating's main research focuses on the economics of disasters and climate change adaptation, with particular reference to valuing intangible impacts, the risk of maladaptation and decision-support methodologies. Her skills include incorporating socio-ecological dimensions into economic analysis and vice versa, especially in regards to questions of resilience and vulnerabilities. Ms. Keating has a special interest in the research needs of policy-makers and other end-users, and the mechanisms by which research informs decision-making. Her research has included food security, traditional knowledge for disaster risk management, issues in disaster impact assessment, climate change adaptation economics under deep uncertainty and rapid change (obtained from staff profiles at iiasa.ac.at).

Ainun Nishat (Prof.)

Prof. Nishat is the Vice Chancel/or, BRAC University, Dhaka, Bangladesh: He was Country Representative of International Union for Conservation of Nature and Natural Resources

(IUCN) in Bangladesh from 1998-2009 and its Regional Advisor on Climate Change in 2009-2010 period. Earlier, Dr. Nishat worked as a Professor, Department of Water Resources Engineering, Bangladesh University of Engineering and Technology (BUET). He has been working as a catalyst, advocate, educator and facilitator, championing the wise use of natural resources and sustainable development in Bangladesh for decades. His arena of work and interests include water resource development and management, environment management, biodiversity conservation, coastal zone and wetland conservation and management, disaster management, adaptation to climate change and climate variability and related policy advocacy. Prof. Nishat has been a member of the Bangladesh National Water Council, Indo-Bangladesh Joint River Commission, Bangladesh National Agricultural Commission and the National Council on Science and Technology. As an expert on management of trans-boundary water resources, Prof. Nishat had played an important role in the Ganges Water Treaty negotiations. He had contributed in water sector policy formulation, and agriculture sector policy revision and strategy formulation. Prof. Nishat is actively involved in global climate change negotiations and is a key member for Bangladesh negotiation team. He is also member of the Compliance Committee of Kyoto Protocol of UN Framework Convention on Climate Change (UNFCCC). He is a Fellow, Institution of Engineers Bangladesh.

Akio Takemoto (Dr.)

Dr. Takemoto is the Director for the Asia-Pacific Network for Global Change Research (APN). From July 2010 to July 2011, he was Project Researcher at the Integrated Research System for Sustainability Science (IR3S), the University of Tokyo. From April 2010 to Jun 2010, Dr. Takemoto served as Director of the Groundwater Office as well as the International Cooperation Office at the Ministry of the Environment, Japan (MOEJ) after serving as Deputy Division Director for international affairs and environmental impact assessment (August 2003 – March 2010). He served as the first and second Secretary of the Permanent Delegation of Japan to the OECD based in Paris (August 2000 – August 2003). Dr. Takemoto began his career on Environment Administration (Environment Agency and Ministry of the Environment, Japan) in April 1992. He obtained a Doctorate of Engineering (Ibaraki University) Degree in 2010 and Master's Degree of Science (Hokkaido University) in 1992. His main research field is sustainable development in developing countries, including climate change adaptation and mitigation.

Ali Tauqeer SHEIKH (Mr.)

Mr. Sheikh is CEO of Leadership for Environment and Development (LEAD) Pakistan (www.lead.org.pk). LEAD is a non-for-profit, non-partisan organisation that specialises in sustainable development. Mr. Sheikh is also the Asia Director for Climate and Development

Knowledge Network (CDKN). Led by Pricewaterhouse, CDKN (www.cdkn.org) is a global alliance of five organisations ODI, Intrack, FuturoLatinamerico, South South North, and LEAD. Mr. Sheikh has vast experience in training and facilitating multi-sectoral and multi-disciplinary expert groups on policy planning, leadership development and consensus building. In the context of Climate Change, he is involved in several regional and international dialogues and consultations to bring concerns relevant to Asia at the forefront. Presently, he is involved in helping design and plan the Climate Change Roadmap for the Government of Pakistan, and the Work Programme on Climate Change Migration as well as the Loss and Damage Program for the Government of Bangladesh. Mr. Sheikh has led work on various facets of climate change in Pakistan and across Asia, especially mainstreaming climate change with the development concerns. He has spearheaded the establishment of several climate change forums including the Knowledge Network on Climate Change (KNCC), Climate Leaders Action Network (CLAN) and National Alliance for Climate Action (NACA). As an expert he also serves on the advisory boards or steering committees of various international and national forums and networks, including Asia LEADS Partnership (ALP), Climate Action Network South Asia (ANSA), and Asia Pacific Migration and Environment Network (APMEN). He has served on several boards and is a member of national commissions and committees including the apex environmental body in the country, Pakistan Environment Protection Council (PEPC) chaired by the Prime Minister of Pakistan, the Taskforce on Climate Change set up by the Planning Commission of Pakistan, and the Core Group constituted by the Ministry of Climate Change charged to advise the Government of Pakistan on climate negotiations. Mr. Sheikh has represented Pakistan in several negotiating rounds since the 2001 World Summit on Sustainable Development. Mr. Sheikh has studied at Quaid-e-Azam University Islamabad, Australian National University, Canberra, and University of Miami, Florida, from where he obtained Master's degrees in International Relations and Strategic Studies. Mr. Sheikh has been a Fellow at the Institute of Soviet and East European Studies (ISEES) Miami; the International Institute of Strategic Studies (IISS) in London, and the Rockefeller Foundation in New York.

Apichart Anukularmphai (Dr.)

Dr. Anukularmphai is the Chairman of Technical and Project Appraisal Sub-committee and other water related important committees in Thailand. Educated in Israel and the United States and with over thirty years of experience in research, development, policy and institutional development, and management in the field of integrated water resources management, agricultural and rural development, and environmental impact assessment, in the Asian region; has served on a number of national, high-level policy making committees (e.g., National Water Resources Committee; National Rural Employment Generation Committee; Sub-committee for Co-ordination of Provincial and Central Plans for Rural

Development; Committee for Co-ordination and Acceleration of Water Resource Development); has extensive international experience in development cooperation, networking and institutional development, and has strong linkages with international research, development, and funding organisations; has demonstrated exceptional qualities for international and intercultural relations.

Arjunapermal Subbiah (Dr.)

As the Director, Dr. Subbiah, has operational responsibility for the RIMES Regional Early Warning Centre. He provides strategic direction and leadership for translation of policies, established by the RIMES council, into programs. With 25 years of experience assisting countries in developing multi-institutional and multi-disciplinary mechanisms to manage natural hazards, Subbiah held senior positions with the Government of India and was involved in policy formulation and implementation of development and disaster risk reduction programs till the late 1990's. Subsequently, Subbiah held the post of Director, Climate Risk Management and Team Leader for Early Warning Systems at Asian Disaster Preparedness Centre and evolved and implemented a multi-country Climate Risk Management program and regional multi-hazard project that eventually transformed into RIMES as an inter-governmental and international institution in 2009. Subbiah has been one of the main reviewers of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX).

Baqi M.A. Khalily (Prof.)

Dr. Khalily was a Professor of Rural Finance at the University of Dhaka. He had his MS. and Ph.D from the Ohio State University, USA. After teaching for 37 years at the University of Dhaka, he joined Institute of Microfinance (InM) as its Executive Director on October 1, 2012. He was also the Founder Executive Director of the Institute from September 2006 to January 2010. He has devoted his research in the areas of micro finance, enterprise development, impact assessment and sustainability analysis. In recent years, Dr. Khalily has ventured into the area of climate change and adaptation through micro finance. He is co-leader of the joint research project on Climate Change, Adaptation and Micro Finance undertaken by IGES and InM. In addition, Prof. Khalily has been working on coping strategies of the Poor Households affected by covariate shocks in the Northern Part of Bangladesh. He is leading several longitudinal studies: one on Access to Financial Services in Bangladesh, and Impact Assessment of multi-dimensional interventions (PRIME) of PKSF for alleviating state of famine caused by covariate shocks in North-Western Bangladesh. The project is now in the sixth year. He has also keen interest in corporate governance. He is the Chairman of the Center for Corporate Governance and

Finance Studies at the University of Dhaka. In the past, he has conducted research studies in the area of insurance as a risk-minimising strategy. With his understanding of risk minimising role of insurance and micro finance, Prof. Khalily possesses wider perspective on sustainable development for the poor households. He has published in national and international journals.

Bhichit Rattakul (Dr.)

Dr. Bhichit is the Special Advisor to ADPC and President of the University of Bangkok Metropolis. Dr. Rattakul is a scientist with over 20 years of experience in Industrial Science and Technology Research in policy and management as well as Disaster Management, Environmental Education and Research and has been a key supporter of multi-cultural Natural Resources Management programs. He is a key advocate and promoter of community – based disaster risk reduction activities. With a doctorate in Biotechnology from USA, he taught fulltime at Faculty of Science for Chulalongkorn University until ‘80s. His work has encompassed both academic and political arenas, and was elected three times as a Member of Parliament and served as Science and Technology Portfolio Cabinet member of Royal Thai Government. In the year of 1997 he was elected as Governor of Bangkok and served until 2001. Again, he was an elected as Senator from Bangkok in his last political assignment. Dr. Bhichit initially joined the Asian Disaster Preparedness Center (ADPC) in 2005. In 2006, he took on the role of Executive Director a. i. and served as Executive Director from 2007 until 2012.

Charles Rodgers (Dr.)

Dr. Rodgers is a Senior Environment Specialist with the Asian Development Bank, Regional and Sustainable Development Department, where he leads ADB's climate change adaptation program. The current focus of ADB's adaptation program is on developing and enabling a comprehensive framework for managing climate-related risks to infrastructure investments aligned with and embedded within the ADB project cycle, comprising: (1) comprehensive, context-sensitive climate risk screening; (2) impact and vulnerability assessment for projects at-risk; (3) evaluation of adaptation options (including economic analysis); (4) securing of adaptation co-financing as required; and (5) on-going monitoring, evaluation and knowledge management to ensure delivery of benefits and to improve the design of subsequent projects. This risk management framework will be fully aligned with efforts to establish integrated disaster risk management, as these frameworks share an overall emphasis on building resilience. Dr. Rodgers' training and professional expertise encompass three complementary disciplines: agriculture, water resources and global climate change. He has led projects at the International Food Policy Research Institute, the Center for Development Research (ZEF) at Bonn University, and has served as a consultant on a

wide range of international projects emphasising climate change, water resources and irrigated agricultural production. Dr. Rodgers holds a PhD in Civil Engineering (Hydrology) from the University of Wisconsin, where he was a U.S. Department of Energy Global Change Fellow; and an MS. in Agricultural and Natural Resources Economics from the University of Minnesota.

Doreen Frances Stabinsky (Prof.)

Dr. Stabinsky is Professor of Global Environmental Politics at College of the Atlantic in Bar Harbor, Maine, joining the faculty in 2001. She actively researches and writes about the impacts of climate change on agriculture and food security, and on the emerging issue of L&D from slow onset impacts of climate change. She also serves as advisor to a number of governments and international NGOs on issues related to agriculture and L&D in on-going negotiations under the UN Framework Convention on Climate Change. Her recent publications on L&D include a series of briefs co-authored with Juan Hoffmaister, published by the Third World Network, and a draft framework for an international mechanism on L&D in the report “Tackling the limits to adaptation: an international framework to address ‘L&D’ from climate change impacts,” published by ActionAid, CARE International, and WWF. Recent publications on agriculture include “Agriculture and climate change – state of play in the UNFCCC negotiations” and “Ecological agriculture, climate resilience, and a roadmap to get there,” co-authored by Lim Li Ching, both published by the Third World Network. Dr. Stabinsky also closely follows international negotiations on biosafety and is a current member of the Ad Hoc Technical Expert Group on Risk Assessment and Risk Management under the Cartagena Protocol on Biosafety. She is co-editor, with Stephen Brush, of the book *Valuing local knowledge: indigenous people and intellectual property rights*. Her Ph.D. is in genetics from the University of California at Davis.

Gorden Kemmery Lowry (Dr.)

Dr. Lowry is Adjunct Senior Fellow in the Research Program, East-West Center, where he is working on climate change adaptation projects in Hawaii and Asia. He is Emeritus Professor and former chair of the Department of Urban and Regional Planning, and former director of the Program on Conflict Resolution, University of Hawaii. He has worked with several government agencies, non-profit organisations and foundations in Hawaii and with the UN Development Program, US Agency for International Development, UNICEF, International Maritime Organisation, Packard Foundation and Asia Foundation in Sri Lanka, Thailand, Indonesia, Philippines and China. He was a Fellow in the Marine Policy Program, Woods Hole Oceanographic Institution in 1985-86. He has published articles on coastal management, conflict resolution and evaluation in journals including *American*

Planning Association Journal, Urban Law Annual, Publius, Environmental Impact Assessment Review, Ocean Yearbook, Coastal Management, Ocean and Coastal Management, Policy Studies Review, and the Journal of Planning Education and Research. From 1966-69, he was a Peace Corps Volunteer in Sarawak, Malaysia. He is recipient of both the Robert Clopton and Hung Wo and Elizabeth Lau Ching awards for community service at the University of Hawaii.

Harjeet Singh (Mr.)

Mr. Singh is the International Coordinator – Disaster Risk Reduction & Climate Adaptation for ActionAid. He is based in New Delhi, India and supports countries across the globe on the programme and policy advocacy work related to disasters and climate change. He represents ActionAid in various international forums and has conducted sessions and trainings on emergency response, Disaster Risk Reduction and Climate Change Adaptation in over 20 countries for government and non-government agencies. Prior to this, he led the Tsunami Response Programme in the Andaman and Nicobar Islands for ActionAid India.

Hideyuki Mori (Mr.)

Mr. Mori is currently serving as the President of Institute for Global Environmental Strategies, Hayama, Japan. He is a graduate of the School of Engineering, Kyoto University. He joined IGES in 2003 prior to which he served as Environment Specialist at the Asian Development Bank, Senior Environmental Coordinator of the United Nations High Commissioner of Refugees, Director of the Office of Research and Information at the Global Environment Issues Division of the Environment Agency of Japan (present Ministry of the Environment), and as Portfolio Manager of the Division of GEF at the United Nations Environment Programme. He is the president of IGES since 2010.

Hiroshi Tsujihara (Mr.)

Mr. Tsujihara currently serves as Director of Research and Information Office, Global Environment Bureau of Ministry of the Environment of Japan. He joined the Government of Japan in 1991. He worked in the fields of water environment, international cooperation, and global environment. He was dispatched to the Ministry of Natural resources and Environment of the Socialist Republic of Vietnam as a JICA expert before taking up his current position in August 2012.

Isabel Kreisler Moreno (Ms.)

Ms. Kreisler passed MSc. with Distinction in Environment and Development, from the London School of Economics and Political Science. She is an independent international consultant, policy advisor on climate change policy. She has over 10 years work experience

with for international institutions (IIED, AECID, Oxfam, UNDP, WB etc.) on sustainable development programming and policy. She is providing technical assistance to the Central America Integration System (SICA) and UNEP-ROLAC (Regional Office in Latin America and the Caribbean) on L&D in the framework of UNFCCC negotiations.

Kirstin Dow (Prof.)

Prof. Dow is a Professor in the Department of Geography in the University of South Carolina, USA. Her current research interests are climate risks, decision-making and adaptation, environmental change and hazards and vulnerability. Her major research projects address vulnerability, adaptation and decision-making with respect to climate variability, climate change. She has been teaching courses on Human Dimensions of Global Environmental Change, Human Impact on the Environment and graduate Seminars on topics in Environmental Geography. She is a lead author in the research chapter in the Third US National Climate Assessment (expected 2014), and contributing to the Working Group II of the IPCC 5th Assessment Report as a lead author to Chapter 16 on Adaptation Opportunities, Constraints, and Limitations. She currently serves as an editor for *Weather, Climate, and Society*, a journal of the American Meteorological Society, and on the editorial board of *Climate Risk Management*.

Koji Dairaku (Dr.)

Koji Dairaku is a hydrometeorologist who studies regional climate change using a regional climate model. He has been dedicated to the regional climate study focusing on the downscaling of global climate scenarios for over 10 years. His areas of interests include key terrestrial feedback processes responsible for the maintenance and variability of regional hydrological/biogeochemical cycles using a regional climate model, vulnerability and adaptation to climate change in water hazard, influence of anthropogenic activities and biogeochemical responses on climate change and variability in the Asian monsoon region, and impact of climate change and variability on the risks of water disaster.

As a senior researcher in the Social System Research Department in the National Research Institute for Earth Science and Disaster Prevention, he continues to participate in the important regional climate research projects and develops new ways to investigate the potential impacts of human activities at the regional scale. He currently serves as a representative (PI) of the research project "Vulnerability and Adaptation to Climate Change in Water Hazard Assessed Using Regional Climate Scenarios in the Tokyo Region" of Research Program on Climate Change Adaptation (RECCA), and as the group leader of the important research of probabilistic climate scenarios for risk assessment in the SOUSEI Program, supported by Ministry of Education, Culture, Sports, Science and Technology, Government of Japan.

He has served as Visiting Researcher of National Institute for Environmental Studies, MAHASRI (Monsoon Asian Hydro-Atmosphere Scientific Research and Prediction Initiative) committee member of IGBP-WCRP joint subcommittee in Science Council of Japan, member of Climate Scenario Task group of Japan, committee member of Hydrology group in Japan Society of Civil Engineers (JSCE), committee member on Editorial and Publication Affairs of Journal of Japan Society of Hydrology and Water Resources, committee member of training course working group in IHP (International Hydrological Programme) subcommittee.

Kropp Peter Jurgen (Prof.)

Prof. Kropp studied chemistry and physics at the University of Oldenburg and finished a PhD in theoretical physics at the University of Potsdam. At Potsdam Institute for Climate Impact Research (PIK) he heads the Research Area on Climate Change & Development (CCD) comprising the flagship groups on Climate Proof Cities and Sustainable Transitions. Since 2010 he is a Professor for climate change and sustainable development at the University of Potsdam/Dept. Geo- and Environmental Sciences. His research interests are devoted to the analysis of man environment interactions, complex systems analysis and on the development of concepts allowing an assessment of national transition pathways to sustainability. For these aims, he makes use of different formal concepts, i.e. qualitative reasoning, neural networks, viability concepts, fuzzy diagnosis, or other statistical methods. Currently he is coordinating two European Framework 7th research projects on societal transitions to sustainability and standardised damage cost assessments for cities. Jürgen Kropp provided active service as an expert on national and international panels for policy advice on Climate and Global Change issues, e.g. for the Council of Europe, German Technical Cooperation, or European Union. In 2006 he received the Amber Tree Award by the European Union INTERREG office for realisation of a visionary project bringing together economic, social and natural scientists, policy-makers and planners. In 2012 he was awarded by the renowned CleanTechMedia award for the co-foundation of the Climate Media Factory Potsdam, an innovative media lab supported by Potsdam Institute for Climate Impact Research and Potsdam Film University. Jürgen was Visiting Professor at the Mahidol University Bangkok/Thailand (2008-2010) and declined an offer for a full Professorship at Griffith University, Brisbane/Australia (2010) and being coincidentally Deputy Director of the National Climate Change Adaptation Research Facility of Australia. He is a member of the Geogovernance Network Berlin/Potsdam (www.geogovernance.de) which is dealing with georisks in particular and appointed editor in chief of the Sustainability Challenges and member of the editorial board of the Regional Environmental Change Journal.

Linda Anne Stevenson (Dr.)

As Head of the Communication and Scientific affairs Division of the APN, Dr. Stevenson manages the APN's research and capacity building programmes and oversees up to fifty national/regional projects across a broad range of global change disciplines. She ensures that the short, medium and long-term strategies of the APN's science plan are within reach and coordinates the timely evaluation of science-based project activities according to their original objectives.

Dr. Stevenson also manages three new frameworks established in 2012 and 2013 under the APN: Climate Adaptation Framework, that incorporates Loss+Damage; Biodiversity & Ecosystems Services; and Low Carbon Initiatives. She plays a key role in transferring technical skills through a series of Proposal Development Training Workshops undertaken bi-annually to allow challenged, early-career scientists, to compete effectively in APN calls for funding research and capacity development projects in the global and climate change arenas. In terms of Adaptation, Dr. Stevenson has managed over 60 projects related to climate adaptation since the launch of the APN's capacity development programme, CAPaBLE which celebrates its 10th anniversary this year.

As a key member of the APN Climate Committee, who published a synthesis report for scientists and decision-makers in 2011, she has co-edited a book that is being published in Springer's Series "Advances in Global Change Research" entitled Climate in Asia and the Pacific: Security, Society and Sustainability, end September 2013 and with 31 authors. The book provides a wealth of knowledge and perspectives on how to manage the complexity of climate-related global change <http://www.springer.com/environment/global+change+-+climate+change/book/978-94-007-7337-0>.

M. A. Baqui Khalily (Prof.)

Professor Khalily is the Executive Director of the Institute of Microfinance (InM) since October 2012. He was the founding Executive Director of the Institute from November 2006 to January 2010. He retired as Professor from the Department of Finance, University of Dhaka on 30 September 2012 after working there for 37 years. He was the Chairman of the Department of Finance, University of Dhaka during 2000–2003. He did his Master's and Ph.D. from the Ohio State University, USA. Professor Khalily has keen interest in corporate governance and is the current Chairman of the 'Center for Corporate Governance and Finance Studies' at the University of Dhaka. Besides, he was the Director of Dhaka Stock Exchange for the period 2000 – 2009. He was also the Pro-Vice Chancellor and the Acting Vice Chancellor of Presidency University from July 2004 to September 2005. He was Visiting Scholar in the Department of Agricultural Economics and Rural Sociology of the Ohio State University during December 1993 – January 1994. He is renowned nationally and internationally for his vast knowledge and expertise in rural finance,

particularly in microfinance. His current research interest areas are: Rural Credit Market, Sustainability and Regulation of Microfinance Institutions, Impact Assessment and Micro Enterprise Development. Professor Khalily led a number of significant research projects from InM namely “Access to Financial Services”, “Impact of PRIME interventions on Monga Mitigation in Greater Rangpur Region in Bangladesh”, “Monga in North-Western Bangladesh – An Analysis of Benchmark Data of Five Districts in Greater Rangpur”, “Multiple Membership (Overlapping) in Microcredit Markets of Bangladesh”, “Impact of MRA Regulations on Efficiency and Sustainability of Microfinance Institutions”, etc. He is the co-editor of the book entitled “Readings in Microfinance: Reach and Impact” published jointly by InM and the University Press Limited (UPL).

Masataka Watanabe (Prof.)

Dr. Watanabe is Professor at the Graduate School of Media and Governance, Keio University, Japan. He was a chairman of UNEP Asia Pacific Adaptation Network (APAN) since October 2009 and now he serves as a co-chairman of APAN. Prior to joining Keio University, he was a director in the Division of Water and Soil Environment at the National Institute for Environmental Studies, Japan (1991-2005) and also he was appointed as a Professor, graduate school of agricultural and life sciences at the University of Tokyo (2000-2005). He participated to UN Millennium Ecosystem Assessment from 2000 to 2004 as a coordinating lead author in the sub-global assessment. He is a member of numerous national councils and committees in Japanese Government. He received his Ph.D. degree in Civil and Environmental Engineering from Massachusetts Institute of Technology. He has received several awards and prizes for his scientific contributions including the Tien Shan Prize from China in 2003. He has authored more than 120 peer-reviewed international journal articles and two books. His main research interests concern in ecosystem modelling, management of ecosystem services, science for sustainability. He is currently working on development of innovative adaptation systems in China and Mongolia.

Michinori Kutami (Dr.)

Dr. Kutami is leading Green ICT and Environmental Strategy of whole Fujitsu Group as a Principal Technologist in Corporate Environmental Strategy Unit, Fujitsu Ltd. He entered Fujitsu Laboratories Ltd., in 1978. Since then, he had been engaged in the research and development of the environmentally conscious technology. In 2007 he received Doctor of Engineering from Tohoku University. From 2007 to 2011, he had been General Manager of the Fujitsu Corporate Environmental Strategy Unit. He had been Chairperson of Survey and Evaluation Committee of Green IT Promotion Council of Japan from 2008 to 2012.

Mihir Bhatt (Mr.)

Mr. Bhatt is the head of All India Disaster Mitigation Institute (AIDMI), founded in 1989. AIDMI is a community based action research, action planning and action advocacy organisation. It works towards bridging the gap between policy, practice, and research related to disaster mitigation, in an effort to link the community to the (inter)national level humanitarian scenario. Mr. Bhatt holds a master's degree, city planning for developing areas Massachusetts Institute of Technology a in 1987 and a master's degree in urban and regional planning in India in 1989.

Monirul Mirza (Dr.)

Dr. Mirza is Physical Scientist at the University of Toronto. He is contributing to Environment Canada's mandate to develop and evaluate strategies to adapt to the impacts of weather, climate, and climate change, assessment of impacts, vulnerability and adaptation of the Canadian Energy Sector to future climate change, climate change and agriculture scenarios, extreme hazards in developed and developing countries, adaptation baseline and accounting and environmental security and sustainable development. Dr. Mirza is also coordinating Lead Author (CLA): Fourth Assessment Report of the IPCC (AR4), CLA to the Policy Responses Working Group of the Millennium Ecosystem Assessment (MA), CLA to the Sub-global (South and South East Asia) and Lead Author to the Global Scenarios Chapters of the International Assessment of Agricultural Science and Technology for Development (IASTD) and Teach under-graduate and graduate courses on natural hazards, trans-boundary waters, India and South Asia and Environmental Security at University of Toronto. Dr. Mirza has several key publications touching different fields of expertise he has (Based on the profile at <http://www.utoronto.ca/~physsci/menvsci/faculty.html>).

Monthip Sriratana (Dr.)

Dr. Monthip Sriratana Tabucanon is currently Senior Adviser to the Senate and House of Representatives Commissions on Natural Resources and Environment, Office of the Parliament of Thailand; and Director of Climate Change Research Strategy Center, National Research Council of Thailand. She is leading the formulation of the strategy on climate change research in Thailand. She previously held key positions at the Ministry of Natural Resources and Environment of Thailand (MNRE) including the posts of Principal Inspector General, Director General of the Department of Environmental Quality Promotion (DEQP), Deputy Permanent Secretary, and Director General of the Pollution Control Department. She serves as a Board Member of Prince of Songkhla University, Member of the Royal Institute of Thailand, and Board Member of the Sirindhorn International Environmental Park Foundation under the Patronage of HRH Princess Maha Chakri Sirindhorn. She was

leader of several environmental cooperation projects in Thailand including in the establishment of the Environmental Research and Training Center (ERTC) of DEQP.

Dr. Monthip served on the Boards of the following organisations : Stockholm Environment Institute (SEI), Sweden ; Institute of Global Environment Strategies (IGES), Japan ; United Nations Centre for Regional Development (UNCRD), Japan ; United Nations University (UNU) Institute of Water, Environment and Health, Canada ; and as Regional Councillor for South and East Asia of the International Union for Conservation of Nature- IUCN. She is currently the President of the Asia-Pacific Regional Council of the International Council of Women (ICW). She obtained her Doctorate in Urban Engineering from The University of Tokyo. She was conferred the Honorary Doctor of Philosophy degree from Prince of Songkhla University. She received a Royal Decoration from King Carl Gustaf (XVI) of Sweden – The First Class of the Royal Order of the Polar Star. She was recipient of the 2009 AECEN Award for Outstanding Service and Commitment by a Woman in Asian Environmental Compliance and Enforcement.

Mozaharul Alam (Mr.)

Mr. Mozaharul, known as Babu, is responsible for overseeing and facilitating development and implementation of all climate change related projects in Asia and the Pacific Region while ensuring overall consistency with the UNEP Programme of Work (PoW). He also acts as the main link between Regional Office and DTIE as the lead Division on Climate Change and other Divisions working on implementing the climate change sub-programme. He supervises climate change team in the regional office and provides political guidance to the team during start-up and implementation of climate change projects. Mr. Mozaharul has over 18 years' experience in global environmental change with special focus on climate change adaptation and mitigation at national and international levels. His specialisation is particularly on adaptation to climate change and integrating adaptation into development policies and strategies, designing adaptation and mitigation projects, and providing training. Working with multidisciplinary team of experts at national, regional and international levels including technical support to United Nations Framework Conventions on Climate Change (UNFCCC) and negotiations are of his interest and strength. He is working as Lead Author for Working Group II, Chapter 16: Adaptation Opportunities, Constraints and Limits, IPCC Fifth Assessment Report which is recognition of his contribution to scientific work.

Mr. Mozaharul joined Bangladesh Centre for Advanced Studies (BCAS), a renowned policy and action research institute, in 1992 as a young researcher and gradually started managing and coordinating several climate change studies of the organisation. In 2004, he joined the Ministry of Environment and Forests, Government of Bangladesh as a National Project Coordinator to formulate National Adaptation Programme of Action (NAPA) and served for

more than a year. He returned to BCAS in 2005, after successful completion of Bangladesh NAPA, and continued to perform his duties as the leader of the climate change team and programme. While serving BCAS, he worked for a number of international research institutes including International Institute for Environment and Development (IIED), London, UK, and Institute of Development Studies (IDS), University of Sussex, UK. In 2009, he took up new responsibilities at United Nations Environment Programme (UNEP) as Regional Climate Change Coordinator for Asia and the Pacific Region.

Nicholle Koko Warner (Dr.)

Dr. Warner is the Head of the Environmental Migration, Social Vulnerability and Adaptation Section at the United Nations University Institute for Environment and Human Security (UNU-EHS). Dr. Warner researches the risk management strategies used by low-income people and communities to adapt to changing environmental and climatic conditions. She directs three research tracks at UNU related to adaptation: the use of risk management and risk transfer measures, social resilience and environmental change, and environmentally induced migration. Dr. Warner is a Lead Author for the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report. She has been published in Nature talks Climate Change, Scientific American, Climate Policy, Global Environmental Change, Disasters, Environmental Hazards, Natural Hazards, Population and Environment, The Geneva Papers on Risk and Insurance - Issues and Practice, and other journals. She serves on the editorial board of the International Journal of Global Warming. Dr. Warner served on the management board of the EACH-FOR project, a first-time global survey of environmentally induced migration in 23 countries. She was Co-Chair of the German Marshall Fund project on Climate Change and Migration. She helped found and is on the Steering Committee of the Climate Change, Environment, and Migration Alliance (CCEMA) and works with delegates of the UNFCCC climate negotiations on adaptation (particularly in risk management and migration). She oversees the work of the Munich Re Foundation Chair on Social Vulnerability project at UNU-EHS, a network of seven endowed professors and a community of scholars working on related topics. Koko is the UNU focal point to the UNFCCC, focal point for climate adaptation and the Nairobi Work Programme. She is currently UNU focal point to the HLCP. She is a member of the UN's Interagency Standing Committee, Task force on Climate Change, Migration and Displacement. Koko studied development and environmental economics at George Washington University, and the University of Vienna where she received her PhD in economics as Fulbright Scholar. Previously she worked at IIASA, and the Swiss Federal Institute for Snow and Avalanche Research (SLF) at the Swiss Federal Institute of Technology (ETH Zurich).

Poh Poh Wong (Prof.)

Retired from National University of Singapore, Prof. Wong is currently affiliated with University of Adelaide as Visiting Associate Professor. Trained as coastal geomorphologist with field experience on coasts in more than 30 countries, particularly in Asia, especially of small islands. Completed professional courses on tourism (Surrey University), ecotourism (International Ecotourism Society), coastal zone management (UNESCO-IHE), disaster management (ADPC), and tsunami and earthquake warnings (UNESCO-IOC-ITIC). Life Member, Geological Society of Malaysia. Published widely with more than 130 publications on geomorphology, tourism, management, climate change, sea-level rise and tsunami impacts dealing with coasts and small islands. Involved in several international/regional programmes/projects: International Geographical Union (Commission on Coastal Systems), IPCC (3rd to 5th assessment reports), Millennium Ecosystem Assessment (small islands), Asia-Pacific Network for Global Change Research (global change coastal research), IGBP-LOICZ (megacities and urban regions on the coasts), Assessment and Impacts and Adaptation to Climate Change (Seychelles and Comoros), ASEAN-USAID (coastal resources management).

Currently Coordinating Lead Author in IPCC Fifth Assessment Report for the coasts chapter (also CLA for coasts in Fourth Assessment Report and Lead Author for small islands in Third Assessment Report); International Technical Advisor for the UNEP/COBSEA-YEOSU project on addressing coastal erosion in East Asian Seas; External supervisor to Ph.D. student, University of Adelaide; Consultant to new Secondary School geography syllabus, Singapore. Conducts field research on extreme high tides and mangroves for coastal adaptation to sea-level rise. Part of IPCC which won the joint-award of 2007 Nobel Peace Prize and Millennium Ecosystem Assessment which won the Zayed Prize for the Environment in 2005. Awarded Special Commendation from the National University of Singapore, 2008. Received Lifetime Achievement Award from Geography Teachers' Association, Singapore, 2010.

Rajesh Sharma (Mr.)

Mr. Sharma is the Regional Information Systems Specialist, at UNDP Asia-Pacific Regional Centre in Bangkok and is responsible for implementing regional programmes on disaster risk reduction and recovery. He provide policy and technical advisory services in the area of disaster risk reduction and recovery and support to the implementation of initiatives on reducing disaster risks in the countries of the Asian region. At UNDP, his focus is on establishing and strengthening information management capacities of the countries, tsunami risk assessment and mitigation initiatives, and early warning systems. On behalf of UNDP, he has been involved in supporting regional efforts on development of regional tsunami warning system which became fully functional in October 2011. For the

last several years, Mr. Sharma has been leading the establishment and institutionalisation of disaster L&D databases in several countries in the Asian region. UNDP supported disaster L&D databases exist in Indonesia, Sri Lanka, Cambodia, Nepal, Iran, Tamil Nadu and Orissa states of India, Timor Leste. Several other countries such as Cambodia, Myanmar, Lao PDR, Vietnam, Philippines are at various stages of establishing national disaster L&D databases. Some of these databases are available online in public domain. In addition to providing support to disaster risk reduction in countries, these databases have also been used in United Nations Global Assessment Reports of 2009, 2011 and 2013 to derive support for policy advocacy on disaster risk reduction. In addition, Mr. Sharma is also providing technical support and advice to the strengthening of weather forecasting capacities for extreme weather events in Cambodia and Timor Leste to improve early warning system for extreme weather events. Mr. Sharma has been working in the Asian region for more than 15 years on developing capacities for disaster risk reduction and has worked with national and local governments, specialised technical institutions, NGOs, UN agencies and other key stakeholders.

Richard Samson Odingo (Prof.)

Dr. Odingo is Emeritus Professor of Geography with specialisation on climatology and Agriculture. Prof. Odingo has worked on drought and desertification problems in Africa for over 30 years, and for 20 years he was a Bureau Member of the UN intergovernmental Panel on Climate Change (IPCC). At the time of the award of the Nobel Peace Prize to the IPCC on 10th December 2007 he was one of the three Vice Presidents of the IPCC having been Vice President for 11 years. He was also a member of the IPCC Task Force Bureau on Greenhouse Gas Inventories for over 5 years.

Rosalina de Guzman (Ms.)

Ms. Guzman is currently the Chief of the Climate Data Section and in-charge of the archiving and analysis of all meteorological data. She also involves in climate modelling and has done initial work to come up with the Climate Change Scenario in the Philippines using the PRECIS Regional Climate Model developed by the UK Hadley Centre. She has done assessment of climate statistics, trends of extreme climate events including analysis on the observed climate trends in the Philippines in terms of tropical cyclone, rainfall and temperature. She has written papers in relation to the impact of ENSO in the Philippines and has been involved in research related to climate variability and change. She has also been involved in various climate change project and has served as assistant project manager for the UNDP-MDGF 1656 project entitled “Strengthening the Philippine Capacity to Adapt to Climate Change and the Philippine Climate Change Adaptation Program (PhilCCAP) supported by the World Bank. PAGASA’s role in both projects is the provision of climate information for vulnerability and risk assessment of the different climate sensitive sectors such as agriculture, water resources, coastal and the health sector.

Saleemul Huq (Dr.)

Dr. Huq is the director of the International Centre for Climate Change & Development (ICCCAD) since 2009 and intends to support growing capacity of Bangladesh stakeholders, while enabling people and organisations from outside to benefit from training in Bangladesh. ICCCAD runs regular short courses as well as an M. Sc. in Climate Change and Development. Dr. Huq is also a senior fellow at the International Institute for Environment & Development (IIED), where he is involved in building negotiating capacity and supporting the engagement of the Least Developed Countries (LDCs) in UNFCCC including negotiator training workshops for LDCs, policy briefings and support for the Adaptation Fund Board, as well as research into vulnerability and adaptation to climate change in the least developed countries. Dr. Huq has published numerous articles in scientific and popular journals, was a lead author of the chapter on Adaptation and Sustainable Development in the third assessment report of the Intergovernmental Panel on Climate Change (IPCC), and was one of the coordinating lead authors of 'Inter-relationships between adaptation and mitigation' in the IPCC's Fourth Assessment Report (2007). Prior to this he was at BCAS where he was in charge of management and strategy of the organisation which is the leading independent research and policy think tank in Bangladesh. Before that he taught plant sciences both to under-graduate and post-graduates at Dhaka University. In 2000 he became an Academic Visitor at the Huxley School of Environment at Imperial College in London where he teaches a course on global environmental policies. He completed his BSc (with Honours) in 1975 from Imperial College, London, United Kingdom and his PhD in plant sciences also from Imperial College in 1978.

Sanjay Vashist (Mr.)

Mr. Vashist is currently the Regional Director of Climate Action Network South Asia and has been actively working towards mobilised civil society action on Climate policies in South Asian Countries and Region. Under his leadership, CAN South Asia have increased its membership base from 20 to 100 NGOs spread in South Asian Countries. The network has successfully consolidated Climate Actions of NGOs in the region and has built bridges with Government as partners. The combined approach of implementation-networking-advocacy-training has scaled up the outcomes from Climate Actions through implementation and policy. The network has successfully documented the sectoral information in context with Climate impacts / responses in South Asia. The initiative has yielded desired results through informed climate policies in South Asian Countries. In his earlier role, Sanjay has worked as International Coordinator for Climate Action Network International (CANI) in Bonn, Germany coordinating the activities of ENGOs network also acting as focal point for ENGOs constituency of observers under UNFCCC. Prior to

pursuing career in climate change science and action, he worked as Natural Resource Scientist among rural communities of Central India implementing community based projects objectives towards strengthening sustainable livelihoods. Academically he is a 'Forester' with Graduation and Post-Graduation in Forestry from India. He completed his Master in Agro Forestry from Gujarat Agriculture University and Graduation in Forestry from Konkan Krishi Vidhyapeeth, Maharashtra. He has 14 years of experience in natural resource management, implementation of adaptation in key sectors and following international climate change discussions on various platforms for future climate change regime.

Sitanon Jesdapipat (Dr.)

Dr. Jesdapipat is currently working as Associate Professor and Vice Dean for International Affairs, College of Social Innovation, Rangsit University. He has done work on climate change policies, economic instruments and now doing research on climate change and Thai economy for ADB. He was also Vice Dean for International Affairs, College of Social Innovation, exploring innovative ways for communication and agriculture.

Sonke Kreft (Mr.)

Mr. Kreft, Policy Officer at the NGO Germanwatch, focuses on adaptation and L&D in the UNFCCC negotiations. He acts as a project lead for the L&D in Vulnerable Country Initiative. He holds a Research Associate position with the United Nations University - Institute for Environment and Human Security. Prior working for UNU, he participated in setting up an insurance project to adapt to climate change in the Caribbean, and in various research projects for example Munich Re as well as GTZ. Mr. Sonke Kreft holds a BSc in Agriculture and an MSc in Global Change Management.

Soojeong Myeong (Dr.)

Dr. Myeong received her Ph. D in Environmental and Resource Engineering from the State University of New York. Currently, she is a research fellow at the Korea Adaptation Center for Climate Change, Korea Environment Institute, mainly focusing on developing measures and policies for climate change adaptation and climate change vulnerability assessment. Lately she has conducted climate change vulnerability assessment of the Korean peninsula. She was one of the lead authors of the IPCC special report on extreme events and adaptation (SREX). She is also a delegate for the United Nations Framework Convention on Climate Change (UNFCCC) on adaptation.

Terieta Tekiera Mwemwenikeaki (Mr.)

Mr. Mwemwenikeaki is currently working as the Senior Administrator (Deputy Secretary) in the Office of Te Beretitenti dealing with the administration and implementation of Government's policies and Office of Te Beretitenti Portfolios including climate change policy coordination. He obtained his Bachelor of Arts and Post-graduate Diploma on Political Science from the University of the South Pacific. Other than the administrative role, he is also overseeing the following: a. Formulation of Kiribati Joint Implementation Plan for Kiribati National Framework on Climate change and Climate change adaptation; b. Formulation of National Policy on Unexploded Ordinances Management ; c. Formulation of the National Anti-Corruption Policy; and d. Chairing the Kiribati National Expert Group on Climate Change.

Wanglin Yan (Prof.)

Dr. Yan is currently Professor at Keio University, Japan, Leader of the Environmental Innovators Program at Keio University Director of Center for Climate Change Adaptation. Prof. Yan graduated at Wuhan Technical University of Surveying and Mapping in 1982 with a bachelor degree of Engineering and earned his Master Degree in 1989 and Doctor Degree in 1992 at the Department of Civil Engineering, the Graduate School of Engineering, the University of Tokyo. He is a specialist in Geographic Information System and Science and contributed to the design and re-construction plan for Sichuan in China after the city was strike by a massive earthquake in 2008. His research work includes examining the degradation and conservation of the grasslands, making adaptation plans on the Tibetan Plateau and Mongolian Plateau in China, and building resilience with communities through post-disaster reconstruction.

Yoshio Kajitani (Dr.)

Dr. Kajitani is a research scientist at the Central Research Institute of the Electric Power Industry in Tokyo, Japan. He received his Ph.D. in Civil Engineering from Kyoto University in 2004. He also obtained a master's degree in Statistics from the University of Western Ontario in 1999. His major is disaster risk management, especially focusing on socio-economic impacts of natural disasters. His interests are mainly in the applications of Statistics, Economics and Transportation and Utility Engineering to the field of disaster prevention, reduction and recovery.

Young-Woo Park (Dr.)

Dr. Young-Woo Park, a national of the Republic of Korea, joined UNEP as the Regional Director of UNEP Regional Office for Asia and the Pacific (ROAP) in October 2008. Dr.

Park brings with him an extensive and vast experience working in environmental management and international cooperation both with governments and the private sector. Before joining UNEP, Dr. Park was the President of the Business Institute of Sustainable Development of the Korean Chamber of Commerce and Industry where he actively promoted sustainable development concepts and practices to businesses in South Korea. He was Director General of International Cooperation in the Ministry of Environment of Korea. During his time there, Dr. Park played an active role in global environmental issues such as climate change and led the Korean delegation during bilateral and multilateral negotiations. Dr. Park was also a member of a number of environmental committees related to environment including the Presidential Commission on Sustainable Development, the Green Citizens Committee of Seoul City and the Nuclear Power Evaluation Committee. In addition, he headed the Department of Cleaner Production Technology Development and Dissemination at the Korean National Cleaner Production Center and the Industrial Environment Department at Hyundai Institute of Eco-Management. Dr. Park has a PhD in Natural Resource and Environmental Economics from Iowa State University and a Master's Degree in Economics from Southern Illinois University.

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