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ADAPTATION
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Synthesis Report

2nd asia-pacific climate change adaptation forum

mainstreaming adaptation in development: adaptation in action

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The Synthesis Report of the Second Asia-Pacific Climate Change Adaptation Forum - Mainstreaming Adaptation in Development: Adaptation in Action, can be electronically downloaded from the www.asiapacificadapt.net.

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Acronyms

ACCCRN	The Asian Cities Climate Change Resilience Network
ADB	Asian Development Bank
AECEN	The Asian Environmental Compliance and Enforcement Network
AKP	Adaptation Knowledge Platform
APAN	Asia Pacific Adaptation Network
APMEN	The Asia Pacific Migration and Environment Network
AusAID	Australian Government Overseas Aid Program
CANSA	The Climate Action Network South Asia
CCA	Climate Change Adaptation
CSR	Corporate Social Responsibility
EIA	Environmental Impact Assessment
ENSO	El Niño – Southern Oscillation
FAO	Food and Agriculture Organization
FIT	Finance Impact Tool, developed by JICA
GEF	Global Environment Facility
GLOFs	Glacial Lake Outburst Floods
GHG	Greenhouse Gases
ICIMOD	The International Centre for Integrated Mountain Development
ICLEI	Local Governments for Sustainability
ILO	International Labor Organization
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
LDCF	Least Developed Countries Fund
NPV	Net Present Value
PPCR	The Pilot Program for Climate Resilience
RICE	Regional Initiative for Climate Change Education
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SMEs	Small and Medium Enterprises
SCCF	The Special Climate Change Fund
SPA	Strategic Priority for Adaptation
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UN-HABITAT CCI	Cities and Climate Change Initiative
VCA	Vulnerability and Capacity Assessment
WIBI	Weather Index Based Insurance
WWF	World Wildlife Fund

Executive Summary

The Second Asia-Pacific Climate Change Adaptation Forum was held at the United Nations Conference Center in Bangkok on March 12 and 13, 2012. It brought together more than 800 policymakers, scientists, donors, youths and representatives of Asian and Pacific countries. The Forum was organized by the Adaptation Knowledge Platform (AKP) and the Asia Pacific Adaptation Network (APAN) along with several other partners.

The Forum focused on "Adaptation in Action", signifying a shift from deliberations to decisions, plans to policies, and from policies to practices. In particular, it sought to link knowledge to adaptation actions, and explore the challenges of governance underlying adaptation decision-making.

The two-day program was built around four plenary and 25 panel sessions. The main body of the report is organized according to the program with sections on each of these sessions summarizing key statements and arguments made by speakers and participants. In the executive summary, these have been synthesized and grouped into four clusters: practice, governance, knowledge and support.

Practice

Existing practices provide an important foundation for adaptation with insights into opportunities, barriers and capacities. Experiences with development planning and actions as well as past climate are relevant, but not always sufficient for dealing with uncertain and changing future risks.

The most effective ways to adapt are often not known with great certainty in specific places and sectors. But many experiments and initiatives are underway. For this reason, insight from practice, experiences in projects and with plans are crucial to learning how to improve future adaptation actions. Well-designed resilience strategies take into account the experience and knowledge of local experts. Resilience planning requires bringing stakeholders together to learn, while recognizing that there are large uncertainties and differences among places.

Building climate-resilient cities requires careful attention to local government planning both within and beyond municipal boundaries. Experiences from practice also suggest that both technical and social processes need to be taken into account. Peri-urban areas are among the most vulnerable parts of cities as they are far from key services and infrastructure with often most haphazard development. Building resilient cities is about transformational change. New visions for the future of the city, and multiple strategies to pursue those visions are needed.

With respect to managing water for agriculture and food, there is a need to move beyond narrow technical focus on improving water efficiency and productivity as solutions to climate change to include better consideration of real needs, which might also require improving management systems and infrastructure design and operations. Water resource planners, managers, and users often have substantial experience in dealing with climate-related flow variability, and new paradigms encourage more integrated perspectives.

Integration is also important with respect to dealing with the cause of anthropogenic climate change. Specific innovations using agricultural waste materials, and practical experiences in forestry and agroforestry illustrate the merits of closely integrating mitigation and adaptation actions in specific instances. There are undoubtedly many other opportunities for seeking multiple benefits from projects.

There are many potential synergies between disaster risk management and climate change adaptation, but because of distinct histories they still often look at problems and solutions in different ways. Local networks, capacities and initiatives are crucial to reducing disaster risks. Sustained sharing of information about risks, and ways to manage crisis is key to preparedness and must occur at all levels. Integrated approaches to disaster risk management need to move beyond reliance on public expenditure, and consider private and community resources.

Well-managed ecosystems support adaptation by providing services that increase community resilience to climate-related disturbances. Infrastructure built with steel and concrete gives an impression of a tangible adaptation measure, but natural or green infrastructure provided by ecosystems deserves much greater recognition. One issue arising from the complexity of ecosystems is that the replicability of specific ecosystem-based adaptations is not always clear.

Climate change adversely impacts the environmental foundations of good health. Key diseases are climate-sensitive. Health may be affected by climate change through several pathways. Apart from strengthening health systems, it is important that health concerns are integrated into development decisions.

The practices, interests and experiences of non-state actors are crucial to the success of adaptation, and are often under-appreciated. The private sector is much more important for adaptation than is typically recognized; climate change is more important to businesses than many firms realize. Firms engage when there is a clear incentive to do so. Regulations and compliance could also play a role in the private sector. There are significant differences between larger corporations and small and medium enterprises. Firms for the most part have not yet included adaptation to climate change into their core business strategies.

Communities are not idle. People are adapting to climate change. They are using drip irrigation, raising houses, changing crops, and collecting condensation. The strength of community-based adaptation is that it is need-based and takes into account local knowledge and experience. It also empowers communities, giving them a mandate to endorse or make decisions and explore alternative options. The challenge of up-scaling successful experiments in community-based adaptation deserves further analysis.

Governance

There is no governance blue-print for adaptation. In most cases, it will be about starting with existing institutions and policies in a world where there are both champions and spoilers. At the same time more attention must be given to longer-term policies, dealing with uncertainties, and the adaptive transformation of governance systems themselves.

Vertical and horizontal coordination are important for formulating national policies and strategies on adaptation. Adaptation is no longer a standalone project. Mainstreaming adaptation into national action plans and policies requires inter-ministerial coordination and collaboration as well as support from the highest levels.

How decisions are made about adaptation projects and plans influences the extent to which they are accepted, and ultimately their long-term sustainability. One key element is the meaningfulness of public participation. If decision procedures and outcomes are perceived as fair, it is much more likely that adaptation interventions will be supported and pursued. Social differences need to be taken into account, and one way to do so is through representation and meaningful deliberation.

Women and men, for instance, often vary and differ in vulnerabilities and the burdens or benefits received from climate change adaptation programs. One of the lessons from the last few years is that the body of work on climate change adaptation specifically for women was needed, but if practitioners work only with women, much of the effort will be marginalized. Another is that once women have the opportunity to take responsibility in new areas, they gain great respect from others, which in turn advances their representation in decision-making. Addressing gender issues in climate change adaptation provides an additional important opportunity for women empowerment and advancement.

Small island states are not all alike; they vary widely in levels of development and capacity. Proposed adaptation measures for small island states include retreating inland to higher ground, building seawalls, coastal protection, and migration among islands within a country. A regional approach to supporting adaptation helps reduce costs of transactions for donors, brings more supporting resources, and allows sharing of lessons learnt. The limitation is that one size sometimes doesn't fit all.

Migrants and those who stay behind face different risks, and often vary in capacities. A complex set of factors lies behind climate-induced migration. Building resilience of at-risk communities is one way to reduce migration driven by environmental degradation. At the same time, it must be recognized that migration is an important way for people to cope, and in some cases, adapt. The needs and rights of those who cannot move should not be neglected as they are often the most vulnerable.

Knowledge

Major knowledge–action gaps remain with respect to adaptation. Past efforts at closing knowledge gaps have had mixed success. It is therefore very important to learn from the very diverse set of experiments now underway across the Asia-Pacific region. Asia has many lessons to share when it comes to adaptation.

The IPCC provides key information to decision-makers around the world; academics in the Asia-Pacific can play an important role in getting the understanding of good practices into peer-reviewed publications. There is a need for policy-relevant research. There is a need to look into the economic aspects. There is also a need to build capacity on framing adaptation challenges.

Lack of detailed climate change information does not prevent adaptation. Nevertheless, having climate data and scenario projections is certainly useful for adaptation planning. Communicating knowledge informed by detailed analysis of past changes in climate, or future modeled projections of climate change, is difficult. One of the key issues is to make sure that the variables used to describe climate reflect the concerns of the users of that information.

Toolkits vary widely with respect to purpose, spatial level, complexity and intended users. Toolkits to be used by local rural communities need to be simple and attractive. One very important early step is to clarify the objectives with the community.

People in Southeast Asia see the main role of media as educating and informing the public and lobbying with governments. It is important to know how to reach the public. Frequent use of technical terms complicates communication between journalists and their audience. One of the challenges with long-term issues is how to keep them in the news. Climate change should, therefore, not be looked at in isolation; climate crises make existing problems worse. Media is not only for journalists. New social media can turn the audience into speakers, or target specific interest groups. Overall, the media is not doing enough on climate change adaptation, but there are some good examples of what can be done.

The youth are important part of the civil society movements, and are increasingly concerned about climate change. One challenge for the youth is that they are not technical experts. Another is that they are a fast moving human resource. To engage youth effectively needs different media tools – those which link into social networks and other platforms where the youth are really active.

Generalizations about fostering fruitful South–South collaboration are difficult as a lot depends on issues, needs and countries involved. Commonalities and differences need to be noted. Some lessons learned include the importance of face-to-face interactions where people can share insights into both mistakes and successes. Facilitating or supporting organizations is also important.

Communities are responding to changes on their own by using traditional knowledge and coping practices. Facilitating autonomous adaptation is important, given the uncertainties surrounding climate change, the diversity of local environments, and the restricted knowledge about those environments. Sharing knowledge is vital to local climate change adaptation, and must take place between several different stakeholder combinations. Scientific knowledge about climate change is useful, but rarely sufficient for effective local adaptation. Experience-based, place-specific knowledge about past climate events as well as sources of resilience and effective responses is also needed.

Support

Notwithstanding impressive local practices, initiatives that engage multiple stakeholders and increased understanding of climate change, support for adaptation in terms of capacity building and financing is still needed in many countries.

International support is important for successful implementation of adaptation measures in developing countries. International negotiations on mitigation have made progress but not enough; adaptation is getting more and more challenging. A long-term commitment to adaptation is needed and underway, and must be pursued in parallel with mitigation efforts.

Asian countries need as much as USD 40 billion per year for the next four decades to adapt to climate change. The 2011 Bangkok floods underlined how disasters in one place can have large regional impacts. Supply chains of many key products were seriously disrupted. The recent flooding in Thailand and neighboring countries should act as a call to action for the Asia-Pacific region.

Analyses of ADB's investments suggest that it costs 5% to 15%, and sometimes as much as 20%, more to climate-proof investments in infrastructure such as roads, pipelines or bridges. That an infrastructure is projected to be adversely affected by climate change does not necessarily imply that it should be climate-proofed. The cost-effectiveness of climate-proofing infrastructure depends on the benefits. The economics of climate-proofing should not be confused with the financing of climate-proofing. If we don't get the money expected, the investment will not be climate proofed.

Sources of adaptation financing include capital markets, private financing, market rate loans, equity, concessional loans, carbon offset flows and others. Bonds, for example, are a way of attracting private finance if one can have some kind of index that shows reduction in vulnerability. The insurance industry has a stake, and thus an interest in funding research into minimizing the economic consequences of climate-related disasters.

Poor countries and poor people will be most affected by climate change. Adaptation planning must be context specific and often local. There are many useful existing practices upon which to build effective responses. Communities need support and technologies to increase abilities to manage risk, and build more resilient societies.

Introduction

This report is a synthesis of the key statements and arguments made by speakers and participants during the Second Asia-Pacific Climate Change Adaptation Forum held in Bangkok at the United Nations Conference Centre from March 12 to 13, 2012. In preparing the report, we drew on our participation in the sessions, the summaries provided by a team of rapporteurs, and the background briefing notes written by participants.

The report is organized thematically following the structure of the forum program. If a particular panel talk raised significant points about a theme beyond the one they were in, then these are reported under the theme rather than under the panel. Specific statements by speakers in plenary sessions are attributed within the text, whereas those made in panels are attributed in the endnotes.

Plenary 1 - Adaptation in Action

Anna Lindstedt
Ambassador for Climate Change at the Ministry of the Environment, Sweden

Anna Lindstedt underlined that adaptation planning must be context specific, and thus, often local. She noted that "poor countries and poor people everywhere will be hardest hit." It is important to recognize that people are affected by climate change – not just ecosystems and infrastructure. Communities need support and technologies to increase abilities to manage risk and build more resilient societies.

Shigemoto Kajihara
Deputy-Director General of Global Environment in the Ministry of Environment, Japan

Shigemoto Kajihara noted that climate change adaptation is in part about becoming more resilient to disasters, and in part about focusing on strategies to achieve sustainable development. Japan is also involved in and supports many regional adaptation activities in the Asia-Pacific.

Byungwook Lee
President of the Korea Environment Institute and former Vice Minister of Environment, Korea

Byungwook Lee saw the forum as being about exchanging life experiences in climate change adaptation. He emphasized the value of collaborative exchange and importance of networks to continue work beyond the forum. He underlined that adaptation is sustainable development.

Bindu Lohani
Vice-President of the Asian Development Bank (ADB)

Bindu Lohani said that Asian countries would need as much as USD 40 billion per year for the next four decades to adapt to climate change. The costs of improving infrastructure so that it can cope with floods and other extreme events are typically 5% to 15% of the investment costs. He exhorted governments to act immediately and build resilience and so reduce future vulnerabilities. Some of the ways by which societies can be made more resilient include improving knowledge to make better use of resources; accessing climate funds for specific projects; and designing financial structures that are supportive. He also called for a more integrative and transformational approach to climate change adaptation.

Johan Kuylenstierna
Executive Director, Stockholm Environment Institute (SEI)

Johan Kuylenstierna said that the recent flooding in Thailand should act as a call to action for the Asia-Pacific region: "Nature sent us a strong reminder last year, forcing this Forum to be postponed due to the devastating floods just outside these doors…It was a stark reminder of the vulnerability of our modern societies, and clearly spurs us to focus on both immediate actions and long-term strategies to build resilience to current and future shocks in a world with 9 billion people." He also underlined that while it is possible to learn a lot from historical experiences, such lessons are not infallible. "The future is not what it used to be," he declared, adding that we are now in the Anthropocene era in which humans are the main drivers of global change. To address adaptation effectively, it is important that all key stakeholder are engaged. Kuylenstierna observed that this forum, for instance, would have benefitted from greater participation from the private sector, city planners, energy and health sector, and farmers' groups.

Pithaya Pookaman
Vice-Minister of Natural Resources and Environment, Thailand

Pithaya Pookaman argued that floods like those which ravaged Bangkok and other parts of Thailand in 2011, would not be repeated if the country were to follow a path of more sustainable development. On the other hand, if key infrastructure and land-use planning issues are not addressed, large areas of Bangkok could be submerged. "Climate change presents a clear and present danger to our lifestyle and existence." He also reiterated the importance of green economy, echoing the sentiments expressed on video by the Executive Director of UNEP, Achim Steiner. Pookaman shared that the climate change policy board chaired by Thai Prime Minister Yingluck Shinawatra was preparing a 10-year master plan. At the same time "The successful implementation of these plans and policies depends on… all levels of government and requires better linkage between research and action," said Pookaman.

Keith Alverson
Head of Climate Change Adaptation and Terrestrial Ecosystems Branch, Division on Environmental Policy Implementation, UNEP, Nairobi

Keith Alverson emphasized the importance of local information. In an interview at the forum, he noted that it is important to integrate engineering, community and ecosystem-based solutions.[1] He also reiterated the importance of linking bottom-up approaches to national and regional plans. UNEP Executive Director Achim Steiner, in a video statement, explained the importance of supporting regional knowledge platforms, ecosystem management, and financing.

Youssef Nassef
UNFCCC Secretariat

Youssef Nassef asked the participants at the 2012 Bangkok forum to specifically consider how *The Cancun Adaptation Framework* might be made to better serve regional actions. Under the Nairobi work program, there are opportunities to work with many partner organizations both in the public and private sector. He also asserted that there is a long-term commitment towards adaptation.

Dipesh Chapagain
Youth representative, Nepal

Dipesh Chapagain ended the plenary with a speech that often returned to the theme of social justice in adaptation. *"Those countries who have not contributed to the causes are suffering the most and have the largest need for adaptation. We, the young people, are finding our future more uncertain and unpredictable. The future generation may not find this earth livable. Therefore, based on the principal of equity and justice, developed countries must compensate the countries whose contributions to climate change is negligible, the young who inherit these problems and the next generation which has not even been born."* [2] He also quoted from the Asia Pacific Youth Declaration on Climate Change and Sustainable Development arising from a meeting in Kathmandu in August 2011, reiterating the need for financial support, and arguing that this should be in the form of grants rather than loans.

P1 - International Agreements and Initiatives

The Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) has an Adaptation Program to support developing country Parties in assessing, developing and implementing adaptation plans, policies and actions.[3] The program also supports strengthening of the scientific basis for international climate change policy, and the activities of various Convention bodies. Activities of adaptation program of the UNFCCC cover four areas: science and review; impacts, vulnerability and risks; national adaptation plans and policies; and cross-cutting support and outreach.

The way governments are tackling climate change adaptation is changing. This is reflected in the various ministries such as finance[4] getting and not just ministries of environment. A more coherent fiscal framework is appearing and politically powerful agencies are getting involved. Indonesia, for example, has been proactive in embedding climate change adaptation in ongoing development priorities. A programmatic approach rather than stand-alone projects is crucial. Ensuring that funds reach local level is also important. Here, community organizations and local governments have key roles and responsibilities. With international climate financing becoming available, those countries with effective national systems in place will be able to benefit. It should be underlined that these external finances top up and add value to domestic budgets, they do not replace them.

The Pilot Program for Climate Resilience (PPCR) was approved in late 2008 and operates under the Strategic Climate Fund. It aims to demonstrate ways in which climate risk and resilience may be integrated into development planning and implementation. Comparison of the PPCR and the Adaptation Fund identified some important differences.[5] For example, the PPCR has more funds spread more evenly across regions, but it does not emphasize additionality or newness as clearly as the Adaptation Fund. A mixture of different funding systems is needed to support the diverse adaptation needs.

International support is important for successful implementation of adaptation in developing countries.[6] Needs assessments, funding and technology transfer are all important. One of the challenges for international funding mechanisms is how to prioritize which countries are most vulnerable, and thus should be given priority for funding. In Mongolia, the government has established an adaptation fund, but needs more international contributions and support. There has not yet been, for example, an assessment of technology needs. The government has also approved a 10-year program on adaptation and mitigation, but needs assistance to implement it.

The Asian Environmental Compliance and Enforcement Network (AECEN) was set up in 2005 with 19 members from 16 countries.[7] Since 2008, it has been working with UNEP to evaluate climate change law and policy frameworks and enforcement in Asia. AECEN has also been building capacity for environmental impact assessment (EIA). EIA for projects could take into account climate change by ensuring that developments are resilient, and do not contribute to or exacerbate the adverse effects of climate change.

A long-term commitment to adaptation is needed, and is underway internationally as part of a stronger climate change regime.[8] A key strategy will be to ensure synergy with other long-term processes such as the pursuit of the Millennium Development Goals.

Young-Woo Park, Regional Director, UNEP Regional Office for Asia and the Pacific, summarizing the first day of the forum at the start of the 2nd day, noted that international negotiations on mitigation have made progress but not enough. One consequence is that adaptation is getting more and more challenging.[9] Long-term adaptation needs must be pursued in parallel.

P2 - National Policies, Strategies and Programs

Vertical and horizontal coordination are important to national policies and strategies on adaptation. The details of integration vary with the level of governance. At the national level, it is important for integration of strategies across ministries. At more local levels, integration is across programs or projects with opportunities and challenges in sub-national jurisdictions.[10]

Vietnam's National Target program (2008-15) has been harder to implement than it appears on paper. [11] Key barriers identified include lack of guidelines from central government to line ministries on how to mainstream adaptation; difficulties and lack of capacity for planning under uncertainty; lack of focus on long-term objectives, and sectoral fragmentation. It was also found that the top-down approach sometimes does not work. For this reason, the government has also tried more bottom-up approaches, for example, in a pilot fisheries project in Binh Dinh. This involved building awareness and capacity of local stakeholders and community participation in vulnerability assessments. There were three key findings from this experience. First, that mainstreaming is not only a technical exercise, but also needs participation of multiple stakeholders. Second, that climate change coordination offices at the local government level can play a crucial role in connecting stakeholders. Finally, having an action plan is not enough; you also need budget, trained people, and good coordination and communication. The findings from this pilot project are being taken into account in updating the master plan for the fishery sector.

As part of a recently concluded technical assistance to the Government of Sri Lanka, ADB supported the Ministry of Environment (MoE) in developing a National Climate Change Adaptation Strategy (NCCAS).[12, 13] The NCCAS outlines a comprehensive strategy on climate change adaptation for Sri Lanka. It lays out a prioritized framework for action and investment for 2011–2016, aimed at systematically moving Sri Lanka and its people toward a climate change resilient future. The NCCAS mirrors and supports Sri Lanka's national development agenda as articulated in the Mahinda Chintana (Mahinda vision), and is aimed at ensuring its success and sustainability. Thematic areas identified under this NCCAS include: (i) Strengthening national-level climate-adaptation planning and implementation capacity; (ii) ensuring that future investments and economic plans are climate resilient; (iii) systematically researching climate change adaptation options and disseminating knowledge; (iv) increasing financing for climate change adaptation, and (v) informing and mobilizing stakeholders at multiple levels in support of climate adaptation impacts. To prepare people and economic interests, it is vital to consider climate change as an emerging threat to all sectors and human endeavors. An integrated approach is needed to mainstream climate change adaptation into national planning and development, and improve the climate resilience of Sri Lanka's economy and its people. Such an approach should include cross-cutting interventions that impact across multiple strategic thrusts and sectors in the economy. Given the scale and significance of potential impacts, climate change adaptation must be considered from the early stages of development planning to the implementation of major projects and programs.

China has several important national adaptation programs and strategies.[14] These deal with a complex range of issues, from desertification due to higher evaporation in the northwest to increases in floods and spread of disease vectors in southern China. The "*Adapting to Climate Change in China*" project is exploring ways to improve cross-sectoral integration in three provinces: Inner Mongolia, Ning Xia and Guangdong. The project envisages developing regional climate models and carrying out improved impact, vulnerability and risk assessments in several sectors. The aim is to incorporate adaptation into national and provincial development processes.

Adaptation is no longer a standalone project. Mainstreaming it into national action plans and policies, however, requires inter-ministerial coordination and collaboration as well as support from the highest levels.[15]

P3 - Local Government Planning

Global climate change needs to be taken into account in planning local development. Development strategies need to be climate-proofed or made climate-resilient. *"There should be no development if it is not climate resilient."* [16]

Decentralization is important to enable local governments to act on adaptation strategies. New institutions should not be set up; instead pick up existing ones and build their capacity.[17] Local governments could be given incentives to consider CCA. For example, they could receive additional funds, perhaps initially through donors, if they perform certain tasks well against certain criteria.[18] There is, however, a major gap in knowledge of exactly how to take climate change into account in local government programs and practices.

In Bhutan and Cambodia, the United Nations Capital Development Fund (UNCDF) found several immediate challenges in sub-national level planning.[19] Among these were difficulties that local governments face in dealing with ambiguities and uncertainties shrouding the CC science. As a consequence, most immediate actions are short term and focus on disaster risk response. For longer-term planning to become possible, research knowledge and credible information need to be exchanged with local government bodies and communities. Adaptation should be oriented toward long-term livelihood security and efficient use of resources. In Bhutan, pilot projects have focused on ecosystems, whereas in Cambodia there was more emphasis on projects. The ecosystem-based approach appears to fit local contexts and fares better, especially where projects do not have funds to cover all the communities with needs.

An example of good local government practice is the case of Sai Na Wang, Kalasin Province, Thailand.[20] They established a CCA community learning platform for exchange of environmental knowledge and concerns. Local government funded the facilitation of farmer groups, identified farming strategies, and provided training. Field demonstrations were conducted on the concept of 'sufficiency economy', drawing on local knowledge in soil and water conservation. Farmers were encouraged to undertake mixed cropping, and shift away from monoculture.

Climate-proofing of rural development in India is an enormous task for local governments, requiring finance and knowledge.[21] Safeguarding investments under changing climate conditions is important because it could protect livelihoods and local economies. When evaluating government schemes on climate proofing or adaptation to assess if they reduce vulnerabilities and enhance community resilience, it is important to consider adverse side-effects and duplication as well. There are examples of good practices. One specific area with potential is the Watershed Development Fund where improvement of water management also results in better agricultural yields. Overall, the key challenges in climate-proofing are mandate, technical capacities, knowledge about adaptation, coordination among various levels, and representation.

There has been a significant increase in the expected roles of local governments in planning. There is clearly a need for informed, deliberative, public debate as well as cross-sectoral coordination and integration when it comes to dealing with adaptation at the local level.[22] An immediate and pressing concern is the need to improve the quality and amount of information available to local governments on climate change adaptation. Planned adaptation is preferable to just coping.

P4 - Private Sector Strategies, Responsibilities and Contributions

The private sector is much more important for adaptation than is typically recognized; climate change is more important to businesses than many firms realize.[23] Recent studies show that some sectors are vulnerable directly to rises in temperatures, or changes in rainfall and frequency of extreme events, whereas others are more vulnerable to changing demand and other indirect impacts such as risks to reputation or of litigation. Some leading firms are beginning to take into account climate change in their business strategies, and are examining threats and opportunities. Governments, communities and non-governmental organizations are also beginning to look for opportunities to build partnerships with businesses. Responding adaptively to climate change is partly about taking responsibility in development. Firms that reduce the adverse social and environmental impacts of their core businesses reduce vulnerabilities in affected communities in ways that may contribute to adaptive capacities.

Firms engage when there is a clear incentive to do so, for instance when a flood crisis forces them to rethink risks to their supply chains.[24] Profits are the bottom line – they will engage only when it is profitable for them to do so.[25] Private sector strategies cannot discard these rationales. Regulations and compliance could also play a role in the private sector. The key is to make sure that such actions raise the bar, and do not just create unnecessary red tape.[26]

Competitiveness will always determine just how willing firms would be to share their successful experiences in adaptation. Insurance companies are off-loading assets under risk from climate change.[27] They are also raising premiums because governments are not responding to social needs. The extent to which private sector can be relied on for risk transfer is more debatable; it is likely that government will need to act as backstop.[28]

There are significant differences between larger corporations and SMEs in what they can do with respect to CSR in general, and to engage in climate change adaptation in particular.[29] It is difficult to motivate SMEs without any direct interest as they do not want to bear any additional costs. They are, however, a big segment and could contribute a lot. More attention needs to be given to SMEs.[30] Better documentation of examples where community, government and private sector have come together successfully for adaptation is needed. Chambers of Commerce could be a useful venue for engagement.[31] Large firms may be another way to reach SMEs, at least those which are part of their supply chains.

Universities have an important role to play in supporting private-public interaction for adaptation.[32] Universities educate future decision-makers. They can practice what they teach by making campuses sustainable and climate resilient. They are a source of innovative technologies and policies. They disseminate knowledge through teaching, publications, and training of teachers. They ask questions about long-term trends and objectives. In business schools, the understanding of CSR has improved greatly. There is a younger generation of students keen to use their business skills for the betterment of the planet.

Firms for the most part are not yet including adaptation to climate change in their core business strategies. This is in sharp contrast to the initiatives with respect to mitigation. Nevertheless, it is clear that business has an important role to play in adaptation, and in developing resilience.[33] The private sector, for instance, may be more efficient in carrying out some tasks and providing some services important to adaptation.[34] An important and unresolved issue is how to increase the participation of the private sector.[35] It is clear that more needs to be done to articulate the business case for adaptation, and to share examples of best practices.[36] Venues must be chosen that are attractive to a business audience. Business leadership, once engaged, would attract others. The private sector is important in climate change adaptation, and climate change adaptation is important for the private sector.

P5 - Multi-level Coordination

Adaptation is a multi-level challenge with recurrent problems at each level. At the national level, the typical problems are inter-ministerial competition for resources and lack of communication.[37] At the local level, the challenge is heterogeneity among places. Poor coordination across levels might result in maladaptation. There are also the challenges of ensuring that the top-down decisions or policies and bottom-up initiatives meet.[38] Despite the many challenges, some countries such as Bhutan and Nepal, have been able to allocate most of their adaptation budget to the local level.[39]

The Korean National Strategic Plan for Climate Change Adaptation had three important features: it was legal, it was set up with the participation of 13 ministers, and it was specifically tasked with guiding local government action planning.[40] A second initiative focused more on implementation, however, illustrates the practical challenges involved. The Korea Adaptation Center for Climate Change was set up by the Ministry of Environment under the 2008 plan. It aims to support policy-makers, adaptation institutes and vulnerable people. Its work is focused on national and international cooperation; development of adaptation options and policies; and, dissemination of adaptation information. It raises awareness through web portals and facilitates networking. It also helps to coordinate among stakeholders from different sectors at different levels, including the local level. So far, key institutional barriers have been lack of communication among ministries arising from unclear legal mandate, and lack of both information and capacity to act on adaptation at the local level.

Social protection has four dimensions: *preventive,* (insurance), *protective* (particularly of vulnerable groups), *promotive* (micro-credit) and *transformative* (to reduce discrimination or marginalization). The integration of social protection, climate change adaptation and disaster risk reduction is expected to provide better policy coherence, and improve the effectiveness of adaptation.[41] In most countries, these services are administratively separate. The full integration of these domains, however, is technically possible, with many programs already able to integrate two out of three dimensions.

Regional coordination in the Asia-Pacific is becoming increasingly important—recent disasters with transboundary impacts underline this clearly.[42] But there is also a need for linking top-down and bottom-up approaches, or else important local knowledge will be lost.

Adaptation programs that take a multi-level approach, even if they primarily focus on one level, must manage the challenge of working with different key individuals and organizations at each level. Many questions remain about the most effective ways to do this in practice, institutionally.

P6 - Integrating Adaptation and Mitigation Actions

Many speakers in different sessions as well as participant briefing notes argued about the merits of integrating mitigation and adaptation actions in specific instances.[43] In the panel, several specific innovations and practical experiences were explored to illustrate larger issues in integration.

One of the innovations discussed was that of compressed straw bricks that were developed as a renewable substitute for cement and clay bricks. These were also safer in the event of an earthquake.[44] The straw bricks provide much better insulation than clay bricks, and are not a fire hazard. Moreover, these bricks are made of cheaper local materials.

Another study combining efficient stoves with community-based reforestation of mangroves identified learning as key to integration.[45] Linkages have to be identified and demonstrated. Mistakes happen. Recognizing that is an important strategy for motivating local residents to engage in participatory monitoring and evaluation of mitigation and adaptation projects. The high uncertainty surrounding climate change means adaptation projects should be made more flexible even if they are entirely successful.[46]

A project in Sa Kaeo, one of the poorest provinces in Thailand, attempted to integrate adaptation and mitigation actions in the agricultural sector.[47] It involved provincial government officials, representatives of the private sector and non-governmental organizations, academics and local farmers. A vulnerability assessment improved understanding of climate sensitivities of local cropping and livelihood systems as well as the existing coping practices. Follow-up actions have focused on supporting sustainable farming models such as organic sugarcane, organic rice and agro-forestry. Preliminary research suggests that such systems have a high potential to deal with climate variability and reduce GHG emissions.

In the Philippines, attention has also been given to Good Management Practices in agriculture as a sustainable way to contribute to both adaptation and mitigation objectives.[48] Organic agriculture is viewed as a strategy with high potential as recognized under the Philippine Organic Agricultural Act of 2000. Integrated farming systems, vermicomposting, pasture management and utilization of agricultural by-products, and rearing more resilient livestock and poultry breeds are among some of the other strategies being explored.

Community forestry is another area where there is a clear potential to link mitigation (as in REDD+ initiatives) with building capacities to adapt to climate change.[49] Agro-forests and forests are important sources of income for poor households, and also provide many valued ecosystem services to local residents in addition to carbon sequestration.

A project in Sumatra, Indonesia, for example, aimed at improving the resilience of coastal settlements by strengthening mangrove management.[50] The project involved rehabilitating degraded mangroves, and developing alternative livelihoods to reduce harvesting pressures on mangroves as sources of firewood and charcoal.

P6B - Building Climate Resilient Cities

Building climate resilient cities requires careful attention to local government planning both within and beyond municipal boundaries. Experiences from practice also suggest both technical and social processes need to be taken into account.

Globally, cities contribute 80% of the GDP and are home to 42% of the population. Half a billion are slum dwellers. Integration of climate change concerns into planning is critical to making cities climate resilient.[51] In a pilot project on enhancing climate resiliency, a few lessons were gathered: there has to be increased awareness of climate change issues, strong political leadership, strengthened local government capacity and inter-city learning.

All adaptation is in a sense local. In cities, a key question is whether local practitioners can perform their tasks adequately so that adaptation measures are locally sensible.[52] It is important to know the dynamics of climate, its extremes, its uncertainties, and how such factors influence planning decisions. Building resilient cities is about transformational change. The key elements that contribute to climate resilience are ecosystems and infrastructure besides agents that include organizations, households and individuals, and institutions that comprise rules, regulations and practices. Well-designed resilience strategies take into account the experience and knowledge of local experts.

Multiple strategies are needed: *"It is important to look at the intersection between climate change and urbanization. We need to work on a strategy for building resilience to climate change in the cities. And there are no silver bullet solutions; we have to combine a host of 5 per cent solutions."* [53]

Peri-urban areas are among the most vulnerable parts of cities as they are far from key services and infrastructure, and development there is often the most haphazard: *"Populations residing in peri-urban areas are most vulnerable to climate change because they have neither the modern infrastructure, clean water, and sanitation available in urban areas nor the ecosystems that rural folks fall back on".* [54] Administrative responsibilities in peri-urban areas are fragmented.[55] This was particularly obvious during the floods around Bangkok in 2011 when certain business districts got priority flood protection, and peri-urban residential areas consequently suffered the most.[56]

Urban resilience planning and actions should move out beyond the city boundaries and into watersheds.[57] City land use planning has to be integrated with rural development planning. Flooding is caused by some factors that are within our control, such as drainage capacity, water management decisions, land-use planning and development choice. Is resilient development building on swamplands?

Issues of resilience are also important in Europe, and some of the experiences may be useful for cities in the Asia-Pacific.[58] Portugal has a long coastline and its adaptation options are influenced a lot by European-level actions and initiatives. Knowledge sharing around green urban infrastructure is one area with potential benefits for both mitigation and adaptation. A climate change adaptation plan for Copenhagen was launched in 2011.[59] A key part of the plan is to take a green approach to storm water and flood risk management.

The UN-HABITAT Cities and Climate Change Initiative (CCI) is working with developing countries to address climate change preparedness and mitigation.[60] The program emphasizes good governance and practical actions for local governments and communities. Tools are being prepared to support city leaders and practitioners.

Soft measures are as important as hard infrastructure in planning for climate resilient cities. Urban resilience strategies should go beyond urban boundaries to consider peri-urban, surrounding rural and watershed areas. City land-use plans should be integrated more with rural planning, recognizing the high significance of peri-urban areas. At the same time we need new visions for the future: *"Much of the urban planning is all about mapping and zoning, instead of envisioning the future of a city."* [61]

Plenary 2 - Insights from Practice

The best ways to adapt are rarely known with much certainty. Research offers many suggestions, but there is little systematic evaluation of interventions from which to draw lessons. For this reason insight from practice, experiences in projects and with plans are crucial to improving future adaptation actions.

Charles Rodgers
Senior Environment Specialist, Asian Development Bank (ADB)

Charles Rodgers emphasized that timeliness of information is a key issue for many projects. Detailed assessments take too long to conduct to be part of all projects. Thus, we need effective screening tools that can help identify those situations where more detailed analysis is necessary, and where it is not. There are possibilities for adaptation-related interventions at various stages of the project or planning cycle.

Rajib Shaw
Associated Professor, Kyoto University, Japan

Rajib Shaw noted that local perception of risks is important for improving risk reduction practices. Local residents sometimes are able to detect trends in rainfall but often cannot. He raised a set of questions about practices that need further exploration, including: What are the key constraints in linking field practices to policies? How can adaptation field practices be sustained, evaluated and disseminated?

Ugyen Tshewant
Secretary of the National Environment Commission, Royal Government of Bhutan

Ugyen Tshewang identified the level of socio-economic development as a key constraint in linking field practice to policies. He called for field practices to be better documented, evaluated and scaled up.

Marcus Moensch
President of the Institute for Social and Environmental Transition, USA

Marcus Moench emphasized the importance of resilience planning of key systems like transport and communications in cities. Such a planning requires bringing stakeholders together to learn from the large number of uncertainties and differences among places. Ultimately, much planning should be there to enable self-organization or enhance autonomous adaptation.[62] The Asian Cities Climate Change Resilience Network (ACCCRN) has introduced urban climate resilience planning in 10 cities of India, Thailand, Vietnam and Indonesia.[63]

Kyosuke Inada
Climate Change Advisor , Japan International Cooperation Agency (JICA)

Kyosuke Inada has been tasked with mainstreaming climate change adaptation into practices, policies and strategy development. JICA provided a loan for a water supply project in the city of Khulna, Bangladesh, where many households spend an average of 90 minutes per day fetching water from shared public taps. The development objective was to increase reliable access to safe water. As the city is on the coast, and water sources are affected by salinity intrusion, which may worsen under a changed climate, salinity control features were needed for both short and longer term.

To mainstream adaptation into development, JICA has developed a screening tool called FIT (Finance Impact Tool) recognizing that there is a continuum from projects designed to reduce vulnerability to climate change of an existing system, to projects which are part of business as usual, but to which some adaptation options might be added.[64] The experiences at JICA raised several questions: How is adaptation different from good development? What are the consequences of integrating climate impact considerations into development planning – does it lead to substantial changes in planned actions?

Linking insights from practice to policy, and then back to practices in other locations is an issue of governance, education and technology. Education and research in dialogue with practitioners may be able to scale up key insights. In many cases, simple solutions may be sufficient.

P7 - Managing Water for Food and Agriculture

Competition among different water users, and efforts to maximize productivity and benefits from available water is the normal situation.[65] In Japan, Satoyama landscapes are a complex mosaic of secondary forests, agricultural lands and irrigation ponds interspersed among human settlements. Managing water in these settings requires collaboration and consideration of the multiple uses and ecosystem services derived from the landscape. Studies have documented, for instance, that regulating services have much higher economic value than the more commonly noticed provisioning services like crop or tree production. Paying residents for their stewardship of the landscape to maintain key regulating services appears to be a promising way to increase resilience in the community to a range of disturbances, including those related to climate change.[66]

Comprehensive water management strategies should be developed through multi-stakeholder participation. In South Asia, there is a need for much stronger interaction between water system managers and researchers as well as between local communities of water users and researchers.[67] Mainstreaming climate change adaptation concerns into water management requires special attention to changes in water demand and supply over the longer term, and the often large associated uncertainties.[68]

Improving irrigation efficiency is an important leverage point in many locations in South Asia.[69] In rainfed agriculture, a lot of attention is already being paid to water efficiency, but crop water requirements should also be considered. Improving water productivity is important to adaptation as it provides room for dealing with variability in supply, growth in demand, and differences in water use among crops.

Groundwater is an important resource that needs to be studied more carefully in the context of climate change. In the dry season, farmers in Northeast Thailand use groundwater as well as water stored in farm ponds to cope with seasonal shortages. One of the challenges observed by experts from China, however, was that once groundwater resources start being used, it is hard to stop. Thus, some of the resilience-enhancing features can disappear over time.

Floods and droughts already have a huge impact on human development and well-being. Adaptation to the existing climate variability to reduce water

insecurities is already a pressing need. National water agencies and laws, water user associations and river basin or watershed organizations, and commitments to integrated water resource management frameworks are among many types of reforms in the water sector that have been proposed as a way to deal with the complexities of planning for change.

Integrated water resources management is another promising entry point for introducing climate change adaptation into development. Water resource planners, managers, and users often have substantial experience in dealing with climate-related flow variability, and new paradigms encourage more integrated perspectives. In most countries in the Asia-Pacific region, mainstreaming adaptation into water resources development and management can be enabled by a shift toward more adaptive, inclusive and deliberative forms of governance.[70]

There is a need to move beyond the narrow technical focus on improving water efficiency and productivity as solutions to climate change to include better consideration of real needs, which might also require improving management systems and infrastructure design and operations. Local water users need to be involved in these endeavors, but unfortunately funding for community-oriented water resources management initiatives is often limited.[71]

P8 - Disaster Management and Climate Change Adaptation

There are clear synergies between disaster risk management and climate change adaptation, but because of distinct histories, they still often look at problems and solutions in different ways.[72] Understanding climate variability is crucial, and a good strategy is to build resilience for all kinds of hazards.[73]

A key lesson from the triple disaster in Japan in 2011 is the importance of local capacity and initiative.[74] Inter-municipality relief-aid was timely, flexible and worked well. Neighborhoods helped each other. Community-based action is informed by local knowledge. The central government should build on these capacities by facilitating and supporting these local networks and processes in disaster management. Another lesson is that despite high investments in physical infrastructure such as coastal levees and well-developed emergency warning and evacuation procedures, it is impossible to completely eliminate risks or damages caused by disaster. Sustained sharing of information about risks and crisis management is the key to preparedness, and must occur at all levels, not just at the national level.

Floods in Pakistan in 2011 were unusual.[75] Peaks of water were not the highest observed, but the volumes were unprecedented. The design margins of dams and other structures were exceeded and there was lot of damage. The event underlined the need for better climate change risk assessment. Such analysis should inform the rehabilitation of damaged and lost infrastructure. It is not clear, however, whether there is enough knowledge to effectively climate-proof infrastructure.

The impacts of floods on livelihoods in urban areas vary according to class. Research in four districts in eastern Bangkok in 2006 found that that higher-income households were more likely to be absent from work during floods, whereas the poor have no alternative but to try to get to work anyway.[76] Those with more resources recover more quickly. Investments in health, education and communication can improve the resilience of the poor and vulnerable groups, perhaps even more than the conventional focus on infrastructure.

At the ADB, integrated approaches to disaster risk management combine disaster risk reduction, climate change adaptation and disaster risk financing to increase resilience.[77] The first two pillars help eliminate and manage risks, whereas the third helps transfer risks. Strengthened capacities to govern risks, in turn, depend on policy frameworks, development investment and planning, knowledge and technical inputs, financing and stakeholder engagement. In considering such integrated approaches to risk management, there is a need to move beyond reliance on public expenditure, and consider private and community resources.

P9 - Community-Based Adaptation

Half of the farmers that feed the planet are not literate—you can't talk to them about global climate change.[78] But ask them about their lives, and the answers you will get are: *"Something isn't right; my rain is not coming at the right time; I cannot sow my seeds at the right time; my water is not available in the right quality or quantity either."* At the same time, the communities are not idle. People are adapting to climate change. They are using drip irrigation, raising houses, changing crops, and collecting condensation.

Local vulnerability assessment of residents was carried out in Nepal under a program of assistance from ADB. The work was piloted in four zones, using various participatory tools like seasonal calendar, hazard prioritization, historical timelines, resource mapping and cause-effect mapping.[79]

Around 87% of the rice in Cambodia is rainfed. As much as 40% of the population is below or near poverty line. Cambodia is very vulnerable to climate change. A project in Cambodia that aims to increase resilience through improving agricultural water practices is now underway.[80] It is helping farmers understand climate variability and change. Communities have set up early-warning systems and are exploring alternative farming practices, including diversification of crops and cropping techniques. Improvements are being made to household water use as well.

In areas behind mangroves in Bangladesh, soil mounding techniques were used to make it possible to grow fruits and vegetables in places that otherwise were very difficult to till because of periodical inundation by seawater.[81] The project also identified some salt-tolerant food plants and encouraged the harvesting of rainwater for drinking. It was suggested that some of these interventions might be useful in small island developing states with scarce land resources.

The strength of community-based adaptation is that it is need-based and takes into account local knowledge and experience.[82] It also empowers communities, giving them a mandate to endorse or make decisions and explore alternative options. Many community-based actions are related to management of natural and other resources, or the sharing of risks. With a community-focus, it is often difficult to clearly separate climate change impacts, risks and responses from many other stressors and threats. In practice, such separation may in any case be counter-productive. Access to information and knowledge-sharing about best practices, uncertainties and techniques is very important.

Ways to up-scale successful experiments in community-based adaptation need further analysis.[83] In longer-term programs, there is the possibility of replicating and sustaining promising approaches and abandoning or refining those which are less satisfactory. But in many cases, it seems that continuity of donor support is the key, thus underlining the need for suggesting other pathways for upscaling.

P9B - Gender and Adaptation Mainstreaming

Not all women (or men) are alike. They differ in vulnerabilities and the burdens or benefits received from climate change adaptation programs.

In the Panj region of Tajikistan, many households are female-headed, mainly because of widespread labor migration of men, especially to Russia.[84] Agricultural labor is highly feminized. Women have to bear multiple burdens. In the Soviet era, there was a very high rate of employment for women, but 40% or more of the lands were cotton farms so there was little diversity and other negative impacts on indigenous knowledge in agriculture. Climate change and variability are now causing major problems in Tajikistan with widespread crop failure due to lack of water, unpredictable weather, and increased temperature, leading to pestilence and disease, both among crops and humans besides shortage of water for drinking and domestic use.[85] Levels of knowledge of the likely impacts of climate change, and particularly the options for resilience and adaptation, are low. Making information available to women in ways they can access is particularly important. This can be achieved by providing them training at a time and place that suits them; fits with their other responsibilities; and respects their concerns and roles.

The Ministry of Women's Affairs in Cambodia established a Gender and Climate Change Committee.[86] Its purpose is to coordinate and cooperate with other institutions to mainstream gender in climate change in national policies and development programs. One of their activities is to support the NAPA projects. There are 39 NAPA projects of which only three are being implemented so far. In the initial NAPA projects of Cambodia, very few considered the issue of gender. The UNDP Asia-Pacific Regional Centre supported the country office in obtaining funding from the Global Gender and Climate Change Alliance to look deeper into the issue.[87] They used the basic processes of mainstreaming gender (identifying the needs and priorities of women, and different attitude of men and women toward water resources management) in a water resources management project.

From the perspective of UNDP that works on projects in many countries, it is important to consider various contextual issues like ethnicity, and post-conflict settings to strategize how to introduce gender into climate change adaptation.[88] It is also important for the 'gender team' to interact with those focused on poverty reduction, energy or environment as different technical perspectives pose different challenges for incorporating gender. Within countries, the gender team has found it useful to form partnership with counterparts within government that may be able to influence ministries or particular technical staff who are not yet enthusiastic about working on gender issues.

One of the lessons from the last few years is that the body of work on climate change adaptation specifically for women was needed, but if practitioners work only with women, much of the effort will be marginalized.[89] In order to influence the mainstream, they really need to look at how they influence the larger programs of national governments and multilateral agencies.

Should we not also be looking at climate change impacts on men?[90] For example, foreign income makes it harder for them to marry or to achieve culturally-determined roles expected of them in providing for their households.
They may also suffer from a loss of self-esteem. Lastly, can the kind of action we are talking about achieve transformation or change? Not just in women's immediate circumstances, but in terms of real empowerment.

The evidence suggests that once women get the opportunity to take responsibility in new areas, they gain great respect from others. This in turn advances their representation in decision-making and control of their own life. Addressing gender issues in climate change adaptation provides an important additional opportunity in women empowerment and advancement.[91]

If you want to help build community resilience in adaptation to climate change for vulnerable people, this can only be achieved if we work closely with those people who have to take up and implement adaptation to changes. More than ever, that means working with women.[92]

Key issues to examine in community-based adaptation projects that consider gender are women's time use. Many projects make an effort to increase women's participation and count that as an achievement, but is it really an achievement when we ask women to do more work? One project in India that reduced the drudgery associated with collecting fuel wood had political ramifications—women became more involved in the local politics because they had more free time, and because they were encouraged to voice their needs and concerns.[93]

In mainstreaming gender, the humanitarian organization CARE has found that they often need to find short-term hooks or leverage to address real practical immediate needs, and try to leverage gender into that.[94] Conflicts and tensions need to be managed, not ignored or stifled. There is also a need to move beyond the select few, be it women or men. Many programs return to the same individual leaders, occupational groups and micro-credit schemes. Food and livelihoods security are the underlying causes of poverty programming, and are really good entry points for working on gender. Projects need to start with realistic expectations. Understanding where you are on the gender continuum—it can be harmful, neutral, sensitive, responsive to transformative—is helpful. Transformative change depends on long-term programs. This requires long-term funding.

P10 - Ecosystem Management and Ecosystem-Based Adaptation

Well-managed ecosystems support adaptation by providing services that increase community resilience to climate-related disturbances. Some adaptation challenges may thus be best approached by considering the contribution of ecosystems.

Ecosystem-based adaptation actions are of several types.[95] First are ecosystem management activities to enhance benefits under a changing climate, for example, by maintaining boulders in a river bed. Second are activities such as managing fires or invasive species etc, for reducing risks from climate change. Third is restoring or rehabilitating ecosystems such as mangroves, coral reefs or wetlands,[96] et al, in anticipation of climate change impacts. Fourth is using features of animals or plants to address specific climate change-related problems, like maintaining coastal vegetation to reduce sea water spray on crops, or planting rooftop gardens to reduce temperatures.

Infrastructure built with steel and concrete gives an impression of a tangible adaptation measure. Natural or green infrastructure provided by ecosystems deserves much greater recognition. It can increase the lifespan and reduce the cost of built infrastructure.[97] More investment is needed for protecting green infrastructure.[98] Future risk management capacity will depend on the ability to maintain natural resources base. The importance of ecosystem services for building resilience in communities also needs to be acknowledged. Community-based and ecosystem-based management share many characteristics, especially when the focus is on local ecosystems and community actions are natural-resource oriented.

One issue arising from the complexity of ecosystems is that the replicability or transferability of specific ecosystem-based adaptation measures is not always clear.[99] Principles like maintaining long-term capacity of ecosystem to continue to provide services are easier to transfer. Biodiversity confers natural resilience to climate. At the same time, it is important to consider the multiple threats to ecosystems, for instance, in coastal zones from acidification, agricultural run-off, fishing, warming and tourism.[100] Another issue is that ecosystem-based strategies have limits. There are thresholds, for example, of wave height above which a mangrove ecosystem may no longer be effective in providing protection.[101]

P12 - Mainstreaming and Alternative Media

According to a market research, people in Southeast Asia are very or somewhat concerned about climate change: Philippines (82%), Vietnam (72%) and Thailand (64%).[102] They see extreme weather and spread of diseases as the main dangers of climate change. Overall, 62% believe that climate change impacts in their country will be reduced most by changed behavior of ordinary citizens . People see the main role of media as educating and informing the public (79%) and lobbying with governments (48%). Among those who believe climate is changing, television is perceived as a good source of information about climate change, better than newspapers, radio or websites.

It is important to know how to reach the public. Jargon confuses. Frequent use of technical terms complicates communication between journalists and their audience.[103] Media norms are also a problem. Spectacular deaths and survivor testimony are used again and again to sell news. Climate change as a long-term issue does not fit in easily. Flood disasters capture attention, but still require careful thinking to turn into opportunities to inform the public about climate change in terms of slow sea-level rise. Integrating adaptation with issues of governance, injustice, poverty and unsustainability are other possible ways.

One of the challenges with long-term issues is how to keep them in the news. Audiences tire.[104] One tactic is to mainstream and not even use the word 'adaptation'.[105] *"Don't pay journalists to write about climate change; they should do it naturally."*[106] Climate change should not be looked at in isolation; climate crises make existing problems worse.

Media is not only for journalists. New social media can turn the audience into speakers or target specific interest groups.[107] Often these are people who are already engaged on climate change and other issues. Thus, while new social media has

tremendous potential, mainstream media continues to be important in reaching many vulnerable groups in developing countries as well as those who have not engaged at all with climate change issues.

In Jamaica in 2005, climate change was a controversial subject due to its complex technical terminology and the controversy surrounding its existence. Moreover, the media coverage of climate change issues was low because journalists were focusing on attractive news.[108] Since 2009, there has been a significant increase in the media coverage of climate change though the quality of the productions remains poor. Now, Jamaicans want to know more about climate change and they expect a stronger role and involvement of the government in adaptation. The Panos Caribbean project took off after it trained community members to collect oral testimonies and establish a youth journalist group. Programs were presented on Youth Radio. Reggae songs performed by local singers helped disseminate climate change adaptation messages throughout the country. High media outreach was achieved through a diverse media package that included songs, videos, schools tours, community meetings, tree planting, and sectoral workshops.[109] In the end, the Jamaican Government developed and implemented a national communication strategy on climate change adaptation.

Local media has a special role because many of the climate change impacts and adaptive actions are local.[110] But local reporting is often very limited and uneven in quality. Using media for climate change adaptation requires attention to the audience. Images and graphics can be more powerful than complex explanations. The local media has to be shown that adaptation is newsworthy. This requires some help, for example, in explaining the basics of climate change and how it is affecting their audiences. Networks of journalists are an important resource for building this capacity, and generating ideas.

Overall, the media is not doing enough on climate change adaptation, but there are some good examples of what can be done.

Adaptation Film Festival and Reporting Competition

The winners in the film competition were:

DevTV and United Nations Delopment Programme (UNDP)
Hard Rain

Juan Miguel Ocampo, University of the Philippines, Diliman
Habol Hinga (Catch a Breath)

Atiq Rahman, Bangladesh Center for Advance Studies **Building Resilience of the Coastal Communities in Bangladesh**

The winners for the best reports on adaptation to climate change were

- Tashi Dorji, Three deaths challenge Bhutan's commitment to climate change, Business Bhutan
- Hoem Seiha, Green Farming: New mindset for tackling climate change boosts farmers' livelihoods, Economics Today Magazine
- Manipadma Jena. Indian farmers pool groundwater to protect against drought, Thomson Reuters Foundation, Climate AlertNet
- Dewi Safitri, Lost in Translation: Islam for conservation and adaptation, the story of villagers in Gaguak Malalo, West Sumatra, BBC Indonesia
- Syed Zain Al-Mahmood, At Water's Edge, Dhaka Courier

Plenary 3 - Governance of Adaptation

The quality of governance is increasingly recognized as crucial to successful adaptation. The legitimacy of adaptation interventions depends in part on whether the actors responsible are accountable, whether or not information about the project and decisions is transparent, and whether it is relevant to the stakeholders and their interests.

Thomas Beloe
Aid Effectiveness Specialist
United Nations Development Programme (UNDP)

Thomas Beloe noted that most adaption finance comes from government budgets. But governments are not tracking climate-related expenditures. There are no performance indicators, so accountability is low. Apart from accountability or transparency, other key issues are ownership and participation. Who owns the adaptation agenda has major implications for what is likely to get implemented. Participation is often important for achieving equitable outcomes.

Brian Dawson
Senior Climate Change Advisor
The Secretariat of the Pacific Community, New Caledonia

Brian Dawson believes good governance is the cornerstone of successful adaptation to climate change. Working with developing Pacific Island countries has led him to believe that this requires a decadal program of tracking funds, measuring impacts, and building capacities. This is contrary to the way development agencies think in project-terms, where the aim is to get the project done rather than integrate the capacity and procedures into the decision-making process. The information base too is modest.

Heather McGray
Senior Associate
World Resources Institute, USA

Heather McGray suggested that governance systems themselves will have to adapt to deal with the long-term nature of changes like sea-level rise and new types and levels of uncertainty for which they are generally not well-equipped. Improving the quality of governance involves strengthening the evidence-base of decision-making, improving horizontal and vertical coordination, and expanding public engagement. Public engagement is important to improve understanding, tolerance or levels of acceptable risk among particular stakeholders. It is also important for transparency and access to information and justice.

David Jackson
Head of Asia and Pacific Office
UN Capital Development Fund, Thailand,

David Jackson noted that people have always adapted and reduced risks. Local governments are usually responsible for adapting to climate. They build the dykes, set housing standards and zone land-use. Local authorities make local environment livable – that is their job. They already adapt to climate, but now there is the challenge of adapting to a changing climate. Local governments are unlikely to get much additional money through normal budget procedures from central governments specifically to adapt to climate as it changes. They may need to consider loans, grants, or bonds from other sources.

Sean Batten
Director Climate Change Policy and Adaptation
Australian Agency for International Development

Sean Batten agreed with several of the earlier speakers on the importance of mainstreaming and integrating adaptation measures. Working with Pacific Island countries, it is clear that climate change adaptation – if it is to be considered – must be integrated into concerns in priority sectors and development issues, which are rarely identified as climate related. He also decried the common political imperative for rapid spending and demonstrable actions that led to short-term projects rather than longer-term programs that were really needed. He also argued that the real world in which adaptation projects are emerging is rarely transparent. Monitoring adaptation actions and evaluating their effectiveness is critical.

There is no governance blue-print for adaptation.[111] In most cases, it will be about starting with existing institutions and policies in a world where there are both champions and spoilers. At the same time, more attention must be paid to longer-term policies, dealing with uncertainties, and the adaptive transformation of governance systems themselves.

P13 - Decision-Making, Public Participation and Fairness

How decisions are made about adaptation projects and plans influences the extent to which they are accepted, and ultimately their long-term sustainability. Key elements that provide legitimacy to the actors implementing adaptation projects – whether they are governments or non-state actors – often include meaningful public participation, and engagement with key stakeholders. If the decision procedures and outcomes are perceived as fair, it is much more likely that adaptation interventions will be supported and pursued.

Climate change needs to be translated into a language commonly understood. In Papua New Guinea with low literacy and over 800 languages, communications is a major challenge.[112] Several kinds of impacts of climate change are being observed in the region, and these include coastal and inland flooding, damage to coral reefs, warming in the highlands, and spread of mosquitoes that carry malaria. Cultural diversity has to be taken into consideration while making adaptation decisions and allocating funds.

Decentralization makes room for local participation in flood and disaster management. In Thailand, this can be seen at the level of sub-district local governments and through river basin organizations. But there are many outstanding challenges. Rivers basins will often cover areas with multiple fragmented plans. Floods are primarily managed by other agencies. In some areas, local communities are well-organized and active, and this can make a major difference to how decisions are made.[113] More typically, however, in both Thailand and Malaysia, decision-making has been centralized, and the community's role in managing resources is small.[114]

Fairness is more likely to emerge when key decision-making institutions are more democratic.[115] Fairness has international and national dimensions. National adaptation plans need to be localized.[116] They need to create decision-making space for local communities to design and implement their own adaptation plans and strategies. National-level frameworks should enable local adaptation. *"Equitable distribution of adaptation measures hinges on the power balance in society. We must study and correct this balance to ensure equality in distribution."* [117]

With 50% of world being urban, there is a gap between local production and consumption of food.[118] A major disaster affecting Thailand's rice would primarily impact Manila's poor. Global food governance has many limitations that raise issues of social justice and fairness.

P14 - Climate Proofing Insfrastructure

An analysis of ADB's investments suggests that the climate-proofing cost of an investment project (as a percentage of the capital cost of the project) varies widely, and depends on both the nature of the project and the local circumstances of the project location. It could, in some circumstances, be insignificant, while in others it could reach up to 15% of the capital costs. *"Public lenders and private investors cannot continue to channel billions of dollars into massive infrastructure projects without factoring in the realities of warmer temperatures, rising sea levels, and more violent storms".*[119]

In the water sector of Bangladesh, ADB work focuses on water supply development.[120] Absolute water availability will not be a major concern in the next few decades, even in the dry season. Salinity, however, will significantly increase in proposed water intake points. One adaptation option is to further conserve water in the dry season. In Mollarhat case study, two options and their costs were assessed until 2050. The first involved relocation of the intake points 4km further upstream, while the second entailed increasing the size of the reservoir. Using models and scenarios, various costs and benefits were estimated.

When it comes to drainage in urban areas, there are already serious problems today without even taking into account climate change in the future. Water-logging is expected to become increasingly severe by 2030 and 2050. Adaptation options here include strict implementation of building codes and urban planning measures as well as awareness campaigns. As uncertainties are large, there is a need to consider phased-development or adaptive management approach besides improving monitoring. It should be noted that changes other than in climate may also have far-reaching impacts on the sustainability of infrastructure.

A project funded by ADB and the Nordic Development Fund in Cambodia is preparing vulnerability maps for roads.[121] The project is identifying adaptation options and reviewing local capacities to adapt. Local early warning systems and other approaches, such as green planning or ecosystem-based adaptation measures like roadside tree planting, too are being explored.

Financing is a key issue when it comes to flood-proofing infrastructure.

Many bridges in Papua New Guinea were built in vulnerable areas.[122] A bridge replacement program is underway to improve rural access. Vulnerabilities are assessed against a 50-year design life and 100-year effective life. Impacts related to climate change being considered include structural integrity, access and function, and influence of non-climate factors. Structural integrity, for instance, takes into account log/debris impact, scour, geo-morphological changes, and bed accretion. The assessment project is being done in partnership with WWF and World Bank.[123] Climate projections for 2055 and 2090 were used with a focus on hydrological changes – peak discharge flow and depth. Adaptation measures focus on responding to hydrological changes with modifications of the bridge design. The approach seems replicable, but local and site-specific information and findings will need to be updated as new scientific findings emerge.

That an infrastructure is projected to be adversely affected by climate change does not necessarily imply that it should be climate-proofed.[124] The economic desirability of climate-proofing infrastructure depends on both the costs of climate-proofing options and the benefits of these options. The greatest difficulty is not with the economics, but with the identification of projected changes in climate variables, and then of the physical impacts of these changes on infrastructure. Once these impacts are quantitatively identified, the economic analysis of climate-proofing investment is relatively straightforward. However, simplistic sensitivity analysis may be insufficient to properly explore the uncertainties associated with climate change.[125] There is a need to consider more sophisticated methods (e.g. Monte Carlo simulation) to estimate not only the expected net present value (NPV) of a project, but also its probability distribution, and then assess the risks and circumstances under which the project NPV may be negative. The economics of climate-proofing should not be confused with climate-proofing financing.[126] The economic analysis of climate-proofing investment indicates whether or not such an investment boosts society's welfare, regardless of the financing options available.

P15 - Public Health and Adaptation to Climate Change

Climate change adversely impacts the environmental foundations of good health.[127] Key diseases are climate-sensitive. Under-nutrition and diarrhea each kill more than 2 million people every year, with malaria taking a toll of one million.[128] The links between climate change adaptation and health, however, are often under-appreciated. Drawing attention to the health dimensions of adaptation will need new kinds of stories, like those told by climate change experts and economists, and not just conventional reports on the need to improve access to clean water and sanitation.[129]

Health may be affected by climate change through several pathways.[130] More direct pathways are those such as heat waves or other forms of extreme weather, which directly affect those who are exposed. Most pathways are more indirect, such as changing hydrology or transmission and contamination pathways, which impact vector or water-borne diseases. Even less direct pathways can be imagined such as those which result from competition for diminishing resources. Taken together, these various health effects of climate change could worsen the existing disparities in health.[131]

Patterns of association between major infectious diseases and climate variability in Vietnam were studied using secondary data.[132] Malaria and dengue both showed some correlations with climate variability across years in some regions. Dengue patterns, for example, are linked with the ENSO cycle. Water-borne diseases are more prominent after major floods and storm events. Patterns of association between disease prevalence and climate variables suggest that key health problems are climate sensitive. More research is needed to assess potential implications of climate change itself. Adaptation in public health requires cooperation across areas of expertise and areas of public administration.

The frequency and intensity of heat waves in Guangdong province of China was much higher in the 2001–2010 decade than the five earlier decades.[133] Heat waves are associated with higher overall mortality as well as specific categories of disease. People cope with heat waves by doing things like drinking more water, opening windows and resting in the shade. Many people, however, are not aware of the changed risks of heat waves.

Projecting the impacts of climate change on water-borne diseases is difficult as there are many variables to be taken into consideration.[134] Moreover, historical information on how hydrological and climate variability has impacted such diseases is scant in most parts of the world. Nevertheless, there are good reasons to be concerned, as access to water and sanitation, and the transmission dynamics of diseases like cholera, are all climate sensitive.

The Pacific Adaptation Strategy Assistance Program funded by AusAID aims to help regional organizations and partner countries assess vulnerability and develop evidence-based adaptation strategies.[135] Health vulnerabilities to climate change related factors on Pacific Islands are high for a range of climate-sensitive diseases. Australia also has significant vulnerabilities despite its developed institutional capacities. The existing climate is already extreme with highly variable rainfall. With its economic and natural resource wealth, Australia is in many ways resilient. There is also a fair understanding of extreme weather based on its experiences with cyclones, droughts, heat waves and fires. Nevertheless, many previous extremes were surpassed in the last decade, and the system was challenged to respond effectively. One key message is that *"the future is not like the past... the threats are getting bigger and more serious."*[136] Despite its wealth, Australia faces questions about the limits to adaptation.

Health is both an avenue and receiving end of development.[137] The WHO framework program on health and climate change for the Western Pacific Region[138] aims to increase awareness of health consequences; strengthen health systems capacity, and reduce GHG emissions in health systems; and ensure that health concerns are addressed and integrated in decisions in different key developing sectors. Key activities in last few years under country support program have included health vulnerability assessments, development of national strategies and plans, and promotion of co-benefits of reducing greenhouse gas emissions for improving health.[139] It is recognized that there are many areas for win-win strategies that both save lives now, and reduce vulnerability to future climate. Examples include clean water and sanitation or control of vectors. *"Adaptation to climate change is part of a preventive approach to public health – not a distraction".* [140]

Climate change is expected to increase the disease burden across the Asia-Pacific region with low-income, elderly, children and women the most vulnerable.[141] For ADB, key adaptation options in health include information and knowledge support; strengthening health care system; and climate-proofing health care infrastructure.[142] Information support includes development of weather forecasting and early warning systems as well as analysis to support risk management plans. Possible health care system improvements include disease surveillance and response, and information systems so that relationships with climate can be better understood and anticipated. Important examples with respect to climate-proofing are building more climate-resilient hospitals and making sure they have secure power supplies. In 2012, ADB plans to develop a set of guidelines for climate-proofing investments in the health sector. It is also recognized that there are many opportunities for supporting adaptation options in other sectors that benefit health outcomes. Examples include urban development, agriculture, disaster and water management. The health benefits of investing in these sectors for adapting to climate change should also be taken into account.[143]

P16 - Financing Adaptation

Sources of adaptation financing include capital markets, private financing, market rate loans, equity, concessional loans, carbon offset flows, and others.[144] Another big source of potential finance that is largely untapped is institutional investors. A number of efforts are underway to explore ways of tapping trillions of dollars with insurance companies and pension funds. A small portion of trillion dollars can still be a lot of money. Limited but growing multilateral, bilateral and private finance is becoming available, and can also be tapped.

Several international funds exist to help with financing of adaptation actions in developing countries.[145] The Global Environment Facility (GEF) has three: SPA, LDCF and SCCF. The sectors targeted include ecosystem management, food and agriculture, as well as technology transfer.

A few philanthropic organizations are now paying attention to climate change like George Soros. The Gates Foundation has provided a lot of funds to ILO, which operates a micro insurance innovation facility such as the project on weather index-based insurance (WIBI).[146] The Climate Fund was designed in a way that it could deal with contributions from both public and private sources.[147] An emerging issue is how private climate finance flows should be governed.[148]

On private finance, there are a lot of misconceptions.[149] Politicians realize the need for financing and thus want to involve the private sector. The motivations and drivers, however, are different. For firms, it is all about returns on investment. For mitigation, renewable energy, energy efficiency, there are many technologies.[150] It is clear they can make profit. There is already a need for these technologies in the large and emerging economies. The private sector is now putting a positive spin on climate because they are making money on it.

In case of adaptation, the challenges are bigger. One opportunity is protecting assets, for example in cities by making them more resilient.[151] There is an existing industry around protecting assets. Many of the risks are familiar and just exacerbated by climate change.[152] Regulations such as building codes and minimum standards have a role as well.[153]

Adaptation, by reducing vulnerability to climate change, would be a natural reaction for a company, except that an adaptation strategy for a company may not be an adaptation strategy for a local community. Some companies may shift production to a different place, which would have a negative economic impact on local communities.[154]

The insurance industry has a stake, and thus an interest in funding research in minimizing the economic consequences of climate-related disasters. Reinsurance can help with transfer of risks, for example, between the developed and developing countries. The reinsurance industry can mobilize a lot of resources, but even the reinsurance industry is exposed to catastrophes. Catastrophe bonds offer opportunities to raise billions of dollars to help back

up the reinsurance companies; they could also be used to mobilize funding for adaptation.[155]

The October 2011 floods in Bangkok underlined how private finance or foreign direct investments located industrial estates in places that channel water into the sea. If for some insurance reason, it had not been possible to build these estates, land-use and flood impacts would have been very different. Probabilistic risk assessment (PRA) is an important tool for estimating historic or future climate-change related economic losses.[156] Scenario-based PRA had been applied to Bangkok and gave costs close to other estimates.

In the Philippines, a people support fund is being considered as a kind of meso-level insurance mechanism that will not only look into crops, but also insure local assets and infrastructure through the existing local government unit disaster risk reduction fund.[157]

The issue of subsidized insurance is hotly debated. We know that farmers need insurance, but they cannot afford it. Smart subsidies could provide a buffer up to a certain point after which farmers would have to take responsibility. In the Philippines, a premium for work mechanism is being considered wherein communities can be trained in constructing buffer installations/structures that will ensure that they need not be subsidized, and they could use the money for paying premiums for certain types of insurance.[158] Thus, there are mechanisms that can be developed to reduce the load on government, which currently provides a 55% subsidy to public insurance.

One other possibility is a global climate change disaster fund.[159] The guidelines from IPCC on extreme events could be used to determine whether a particular event is a result of climate, that is, to say whether an event is fully consistent with what is projected. Therefore, some sort of mechanism for eligibility to a fund of that nature can be triggered, perhaps based on an existing UN platform for disaster relief. You can build adaptation into it, and say out of every dollar that goes to climate change related disaster, 25 cents could go into adaptation and prevention.

Bonds are a way of attracting private finance if one can have some kind of index that shows reduction in vulnerability.[160] Bonds might be issued, for example, by the city of Bangkok, which would channel resources to reducing vulnerability. Uninitiated bonds essentially functions as loans.[161] They can be issued by the sovereign government of a country, for instance, or by the World Bank. If a bond is issued by the government, then it is essentially a commercial loan. If it is issued by a development bank, which is a multilateral institution, it can be blended with other forms of finance to create concessional finance for the user.

P17 - Options for Small Island States

Small island states are not all alike. They vary widely in levels of development and capacity. Nevertheless, they have some common features that can be listed. These include segregated populations, lack of direct transport, sparse communication, high vulnerability to climate shocks, and heavy dependence on local resources.[162] With respect to climate change, small island states are vulnerable to sea-level rise, storm surges, and coral bleaching.[163]

Lack of coordination among donors, and complex application procedures mean that small island states have a hard time accessing finance for adaptation. The Fast Start Finance commitment made at Copenhagen in 2009 was supposed to create new and additional funds for urgent climate change adaptation and mitigation actions. But analysis suggests that some of the funds were actually re-labeled aid.[164]

A regional approach to supporting adaptation not only helps reduce the costs of transactions for donors, but also promotes sharing of lessons learnt.[165] The limitation is that one size sometimes doesn't fit all. There are also challenges related to travel, communications, and multiple currencies.

Proposed adaptation measures for small island states include retreat inland to higher ground, seawalls, coastal protection, and migration among islands within a country.[166] Crops adapted to saline conditions and elevated buildings have also been suggested as solutions. One engineering approach that has been suggested is to increase the elevation of some islands by using fill-material from other small, low-lying islands. The main problem with such proposals is cost. Large-scale planting of mangroves is one way to help with coastal protection.

Governments are decentralizing, while people are migrating toward the center.[167] In Tuvalu, for example, there has been substantial migration from outer toward inner islands. In Tonga, smaller island groups are migrating to regional hubs or the capital. In the Maldives, about 200 of the 2000 islands are populated. Relocation from smaller islands to bigger cities on larger islands is also taking place.[168] In Papua New Guinea, residents from low-lying atolls are being resettled in the island of Bougainville with the help of a non-governmental organization.[169]

Small islands in archipelagic countries are a related, but also distinct context for adaptation. Indonesia is an archipelagic country with almost 15,000 islands. Inhabitants are ethnically diverse. Government assistance to smaller islands is limited. Local knowledge is crucial for adaptation on small islands, and needs to be championed and empowered.[170]

P18 - Climate Induced Migration and Livelihood Security

A complex set of factors lies behind climate-induced migration. Five ways in which climate change can lead to migration include sudden onset of disaster, environmental degradation, sinking/inundation of small islands or low-lying coastal areas, forced movements by state, and as a result of unrest, violence or conflicts.[171]

An ADB report released at the Forum noted that according to the Internal Displacement Monitoring Centre, extreme weather over the past two years alone displaced more than 42 million people in the Asia-Pacific region.[172] Many, of course, returned when conditions improved, but not all. Most environmental migration is within countries, but cross-border flows are expected to increase. Strengthening resilience of at-risk communities is one way to reduce migration driven by environmental degradation. At the same time, it must be recognized that migration is an important way for people to cope, and in some cases, adapt.

Migration should be considered as an adaptation strategy and supported. At the same time, the needs and rights of those who cannot move should not be neglected as they are often the most vulnerable.[173] Those who migrate are those with resources to move; not the poorest.[174] It is important to work with those who don't move and stay. While improving people's choice is a good thing, the outcomes of migration also need to be taken into consideration. In some cases, they may result in mal-adaptation.[175]

The IOM has three objectives: to prevent forced migration, to provide assistance to those affected, and to facilitate migration as an adaptation strategy.[176] The Asia Pacific Migration and Environment Network (APMEN) supports knowledge sharing on migration issues. Legal frameworks and international agreements could help protect the rights of migrants.[177] Existing laws on Migration 1951 Convention relating to refugees do not have separate guidelines for climate refugees.

Over half a million people are expected to be resettled from the dry areas in the Ningxia Hui region of China. They are being moved closer to water and infrastructure.[178] The government provides them with houses, training in agriculture, and greenhouses for vegetable production. The private sector is also investing. So far, 180,000 people have already been resettled. Analysis indicates improved livelihood, but loss of social capital – people feel displaced. Community-based organizations need to be established and supported to aid learning in the new location.

The Green Climate Fund could be a good source of financing to support efforts to deal with migration related to climate disasters. Bindu Lohani, vice-president of the ADB, underlined: *"The environment is becoming a significant driver of migration in Asia and the Pacific as the population grows in vulnerable areas, such as low-lying coastal zones and eroding river banks... Governments should not wait to act... By taking steps now, they can reduce vulnerability, strengthen resiliency, and use migration as an adaptation tool rather than let it become an act of desperation."* [179]

P19 - Experiences in the IPCC

The IPCC provides key information to decision-makers around the world. Academics in the Asia-Pacific have an important role to play in getting the understanding of good practices into peer-reviewed publications.[180] From the perspective of normal users or the media, IPCC reports can be difficult to use. Technical terms and information are hard to translate. Information in graphical form is often easier to understand.[181]

Panel 19 on the experiences in the IPCC ended up primarily as an outreach activity on ways to participate in the preparation of the Fifth Assessment Report. The panelists informed the audience that people can participate as contributors and reviewers. They can participate as reviewers for the First Order and Second Order Drafts during the period from 11 June to 6 August 2012, and from 29 March 2012 to 24 May 2013. Academics can also contribute to relevant peer-reviewed journals. But the papers must be accepted by 31 August 2013.

There are increasing challenges in the preparation of chapters in the report, such as the one on Asia,

which focuses on cost and implementation of mainstreaming.[182] There is a need for policy-relevant research. There is a need to look into the economic aspects. There is also a need to build capacity on framing adaptation challenges. Another key issue is the need to build capacity of practitioners and researchers to contribute to peer-reviewed literature. There is a need to build capacities of practitioners so that journals are worthy of being published. Knowledge sharing will have to be increased; online journals will have to be emphasized.

Adaptation has 4 chapters in the 5th Report, with Chapters 14 and 15 focusing on adaptation needs and implementation. The challenges in writing the IPCC Report include defining opportunities, constraints and limits to adaptation, and how they interact with each other.[183] There is also a challenge in identifying social, developmental and biophysical aspects that climate impacts. It is also difficult to rank and compare limits to adaptation.

P20 - South-South Learning Across World Regions

Generalizations about fostering fruitful South-South collaboration are difficult as a lot depends on issues, needs and countries involved. Commonalities and differences need to be noted.[184] Countries in Central Asia, for example, face multiple constraints in adaptation, ranging from lack of information and coordination problems to inadequate financing.[185] Hydrological and meteorological datasets, for instance, are not normally shared, and analysis is done independently despite, or perhaps because of, many transboundary water issues.

One interesting example of South-South cooperation is that between small island developing states in the Pacific and Caribbean. The project plans to identify and disseminate best practices on integrating climate change adaptation and disaster management in the small island context. Exchange of technologies, such as modeling storm surges and impact assessment methods, is also being supported. The project is being undertaken with support from UNDP and many other partners.

The RICE (Regional Initiative for Climate Change Education) project promotes and supports community-based projects on climate change education in the Asian region.[187] The objective is to encourage and support schools and communities to work together to develop climate change-related projects based on their own context and real-life issues. The focus is on training the trainers or educators.

South-South cooperation on the prevention of Glacial Lake Outburst Floods (GLOFs) covers various aspects such as risk assessment, installation of early warning systems, thinning moraine dams, and engaging communities to create awareness about GLOF risks.[188] Some lessons learned include the importance of face-to-face interactions where people can share insights into both mistakes and successes. Facilitating or supporting organizations are also important.

P21 - Local and Experience-Based Knowledge

Communities are responding to changes on their own, using traditional knowledge and coping practices.[189] Local culture and knowledge systems often emphasize human morality in dealing with the environment.[190] Human values are central to design of climate change adaptation actions. Facilitating autonomous adaptation is important, given the uncertainties in climate change, the diversity of local environments, and the limited knowledge about those environments.

Sharing of knowledge is vital for grassroots adaptation.[191] It is important to recognize that this sharing of knowledge has to take place at many levels: from community to community, and from communities to scientists or policy-makers.[192] Adaptation knowledge needs to be contextualized according to local situations, and should make sense to local residents.

Knowledge management activities related to adaptation are helping in bringing about a cultural shift in Madhya Pradesh, India. Dialogue and exchange of information between people and development practitioners is leading to a blending of ideas. One example was in the efforts to climate-

proof fish ponds, which were better understood through learning from other local places.

A lot of general climate change information is fragmented, difficult to access, and understand.[194] Collaborative processes are important for capturing local narratives and lessons learnt on the ground about adaptation. The Climate Airwaves Project in Ghana made use of the community radio to link action research from the bottom up to the policy level.

In Northeast India, islands of research activity are poorly coordinated with government, while gaps exist between local needs, research and policy actions.[195] One way of drawing more from local and experience-based knowledge is by developing processes, which link stakeholders together. These *adaptation learning highways* are platforms for community-to-community, community-to-scientists and community-to-policymakers dialogue. They provide a process through which local knowledge can inform local adaptation plans.

Knowledge management is an iterative process that needs our concerted efforts to ensure it is updated and properly delivered to those who need and use it. At the same time, it is important to avoid duplicating knowledge sharing efforts, especially in various climate change knowledge management networks.

There is a risk that what farmers know about local practices, and ways to effectively deal with climate variability and change will not be transferred. Inter-generational transfer of local knowledge and practice is a challenge, and there is a likelihood of impending knowledge gap between this generation and the next in this context.[196]

Scientific knowledge about climate change is useful, but rarely sufficient for effective local adaptation. Experience-based, place-specific knowledge about past climate events as well as sources of resilience and effective responses is also needed.

P22 - Synergies Between Adaptation Toolkits and Methods in Practice

Toolkits vary widely with respect to purpose, spatial level, complexity and intended users. At one extreme are detailed analyses of climate variability and sensitivity, for example of crops which are aimed primarily at planning officials with technical expertise.[197] Other toolkits are aimed more at training particular groups, such as agricultural extension staff.

FAO, for instance, has developed an e-learning tool to help with community-based adaptation.[198] It is intended for extension officers in agricultural departments and non-government organizations working on climate change adaptation in rural settings. It is based on a set of interactive modules and makes use of videos that show practices in the field.[199] The modules are about the scientific background of climate change, links to food security, preparing and implementing community-based adaptation, et al.

Tool-kits to be used with or by local rural communities need to be simple and attractive to use. The Climate Navigator toolkit was initially developed by a German agency for local governments.[200] The project, Strengthening Adaptation Capacities and Minimizing Risks of Vulnerable Coastal Communities in India (AdaptCap), modified the toolkit for use by communities. The organization of training materials is similar to the FAO e-learning modules.

The Sustainable Development Foundation works mostly with local stakeholders. They reviewed 30 vulnerability and capacity assessment (VCA) tool-kits for local stakeholders, and then synthesized and simplified them so that they could be used by local communities.[201] One example of helping conceptualize adaptation is to think of moving from risk reduction to climate proofing. Start with reducing existing sensitivities, then consider how to manage existing and future exposure, and finally underline what can be done to increase future resilience, flexibility and diversity. The overall VCA process consists of 10 steps. An important difference in this tool-kit is an early emphasis on identifying the goal, and building capacity to understand climate change and adaptation.

For planned adaptation to work, information must flow two ways. ICIMOD has developed a participatory rural appraisal tool-kit.[202] The first step is to look at history of major weather events. Community hazard ranking lets you know which weather events have the most severe impacts on livelihood activities. Seasonal activity calendars let you know when different activities take place. Combining this and other information can help assess adaptive capacities. The notion of *"Adaptation Learning Highway"* was introduced as a way to support knowledge management that would allow information to flow from communities to scientists to local governments.

P23 - Provision and Application of Climate Information

Lack of detailed climate change information should not prevent adaptation. But adaptation decision making could be better supported through appropriate use of existing climate information and climate science.[203] Preparing and working with high-resolution climate scenario projections, however, is technically demanding and time consuming.[204] Dealing fully with uncertainties needs multiple climate models and runs, and thus a set of scenarios.[205] The distinction between precision and accuracy needs to be recognized – climate projections at finer scales do not necessarily mean they are more accurate.[206] An important aspect of evaluating climate models is to assess whether models are capable of simulating key features of the climate in the region of interest – for example, the monsoon.[207] Regional cooperation around the sharing of downscaled model runs and related analyses can make model-informed, scenario-based adaptation planning more plausible. The ADB is now in the process of facilitating a regional climate consortium for this purpose. [208]

Given the technical complexity and uncertainties, communicating trends in observed past climate and in projected future climate conditions to potential users is challenging. It is important to ensure that variables used to describe climate reflect issues of concern to the users of that information. Jargon-laden climate change information makes it hard for lay users to assess its practical value or usability. Sometimes, there is conflicting information. Communication of information on observed and projected climate change to local communities needs to be interactive, and in ways appropriate to local context. The aim of effective communication of climate information should be to foster a sense of knowledge ownership within the community. Experiences and lessons learned from work on disaster risk management at the community level offer helpful insights into challenges and opportunities for communicating climate change information.[209] Field schools, for example, have been an effective way to work with farmers.

The traditional top-down, scenario-driven approaches to using climate information in adaptation assessments can be improved. An emerging alternative approach is to take a much more systems perspective that starts with existing risk management practices and asks if anything else needs to be done or what can be done to make the system robust (or keep the risk within the acceptable level) under different plausible future climates.[210] In this and related approaches, the question of 'acceptable risk' arises. Adaptation actions are required or justified if climate change poses risk exceeding the acceptable level. Acceptable risk, in turn, is subjective and often entails negotiations among interest groups, or is set by representative authorities who would be held accountable for their judgments. But this would place climate change adaptation planning within the broad context of decision making at the appropriate jurisdiction levels with inputs from best available climate science, rather than hinging on the availability of high-resolution climate change projections.

P24 - Youth and Adaptation

The International Centre for Integrated Mountain Development (ICIMOD) based in Kathmandu, Nepal, started a youth program in 2008.[211] The objective was to mobilize youth to engage in various issues, including climate change. Many have been trained about climate change, sustainable development and other issues and have reciprocated with articles and views. The platform ICIMOD convenes gives them a chance to express their views. In August 2011, for example, the Asia-Pacific Youth Meeting was held in Kathmandu. Four people from that event were here at the Forum in Bangkok.

The Climate Action Network South Asia (CANSA) is an NGO that follows climate change negotiations and national and global policies.[212] Youth are important part of the civil society movement in South Asia. The youth participation in international negotiations started a few years back with the Australian Youth Climate Network and US Youth Climate Network. Experience has shown that youth can put pressure on negotiators. One past initiative was "Adopt the Negotiator". One youth was assigned to keep chasing this negotiator whenever the negotiator was outside and keep asking all kinds of questions to let him know that he was being monitored. The youth kept reporting their findings on their blogs.

Blogs are helpful for CANSA to design campaigning initiatives as they explain the difficulties faced during negotiations, which are very complex.

A big challenge for the youth is that they are not technical experts.[213] Thinking with the heart is powerful, but it can also reduce effectiveness and compromise participation. Another challenge is that the youth – even by definition – are a moving human resource. Youth leaders come up, then they get a scholarship and move on (and get older), then new people come, so sometimes there is no continuity. Lack of a proper funding strategy is a common drawback of youth-based organizations working on climate change. The youth are not the focus of donors. Finally, there is a gap between the rural and urban youths.[214] The urban youth are concerned about climatic challenges and environment, but the rural youth are more concerned about livelihood. It's only when the livelihood debate is scaled up to adaptation, can the rural youth be engaged in adaptation activities.

There are many adaptation activities in Bangladesh, but the participation of the youth is very modest.[215] One reason is that they are not treated as being important to society. Another is that the traditional education system forces them to study conventional subjects—few have a chance to study environmental issues. But those who do learn about environmental issues are starting to realize the importance of adaptation. The media does not help much either as its climate reporting focuses more on mitigation issues.

Media Alliance for Social Awareness was involved in a climate change awareness campaign with ADB and SIDA that had a strong youth focus.[216] The effort started at COP15 in Copenhagen. It emphasized mitigation more than adaptation, focusing on behavior and lifestyles. The idea of the campaign was to use traditional media platforms such as television, radio, print media, and community-based communication methods, to drive people to seek additional information on the website and engage more in social media. It is a knowledge tool that aims to drive people into more community-based participation. The objective is to make people believe they could make a difference. One of the insights was that that people felt overwhelmed by the scale of the issue; they felt powerless to act. The campaign assured them that they could reshape the economy and technology.

To engage the youth effectively needs different media tools – those which link into their social networks and other platforms where the youth are really active.[217] The Connect to Climate activities have been successful in linking to many youths in developing countries despite skepticism in some quarters about lack of capacity and limited access.

Plenary 4 - Linking Knowledge and Action

Major knowledge–action gaps remain with respect to adaptation. Past efforts at closing knowledge gaps in the Asia-Pacific are diverse. The results have been mixed with some recurrent challenges. That is why it is very important to learn from the very diverse set of experiments now underway across the Asia-Pacific region.

Kazuya Yasuhara
Professor Emeritus
Ibaraki University, Japan

Kazuya Yasuhara told participants that engineering knowledge, if wisely used, can greatly help adaptation. He gave examples of monitoring systems to assess and design adaptation strategies on the Vietnamese coast where erosion had major impacts. He also noted that insights from those in disaster prevention science and global environmental sciences need some translation to work effectively together. One insight that has emerged is that flexible structures often perform better than rigid ones when attempting to protect or help adapt coastlines or river banks.

Often policies lack good science, while research lacks practical action. More needs to be done at the interface between researchers and policy makers, for example, through dialogue. Knowledge that is so co-produced is more valuable.[218]

Victor Aquitania
Regional Director
Southeast Asia Secretariat of the Local Governments for Sustainability (ICLEI), Philippines

Victorino Aquitania shared how the Twinning Cities scheme in the Philippines linked strong adaptive cities to beginners in the adaptation field. She also emphasized the need for more integration of knowledge, practice and research in adaptation.

Monthip Tabucanon
The Royal Institute of Thailand and former Director-General of the Department of Environmental Quality Promotion, Thailand

Monthip Tabucanon argued that regional centers of expertise have a key role to play in linking knowledge to adaptation actions.[219] So far, there are about 100 such centers linked in a network originally proposed by the United Nations University. They are working to promote education for sustainable development. These include schools and universities, and also zoos, museums and botanical gardens and so on. Climate change is a current thematic focus of the network.

Saleem Huq
Senior Fellow
International Institute for Environment and Development
United Kingdom

Saleemul Huq concluded: *"Asia leads the world in the practice, planning and knowledge generation of adaptation to climate change."*[220] But he also noted that there limits to adaptation – impacts can't be reduced to zero. One reason the Asia-Pacific is at the forefront of adaptation is the wide mix of countries and ecosystems, which is generating a hug variety of lessons. Another reason is that it is home to both developed and developing country governments, such as Japan and Australia or Bangladesh and Nepal or the Maldives, which are very active. Asia has many lessons to share when it comes to adaptation.

Closing Ceremony

Tiang Wang
Student in Foresty and Environmental Studies
Yale University, USA

Tiang Wang noted that the youth have taken climate change debates into new media channels. But youthful passion is not enough; the youth must also learn how to translate awareness into action.

Said Irandoust
President, Asian Institute of Technology (AIT)

Said Irandoust commended participants for their contributions to the forum. He appreciated the *"opportunities for us to familiarize ourselves with our innate adaptation ability."* Bringing together different stakeholders is a catalyst for new forms of knowledge, he said.

Hideyuki Mori
Institute for Global Environmental Strategies (IGES), Japan

Hideyuki Mori said he remains committed to the Adaptation Forums because they are good for knowledge sharing and for communicating adaptation knowledge to a wider audience. This forum also highlighted many important issues related to access and governance of adaptation funds.

AnnaMaria Oltorp
Head of Development Cooperation Section, Embassy of Sweden

AnnaMaria Oltorp concluded that regional coordination and knowledge sharing are critical for climate change adaptation. At the same time, she called for greater participation of youth, business leaders, artists and journalists. She suggested that some possible core themes for the next forum could include public–private partnerships, green economy, urbanization, technology needs assessment, and bridging the climate adaptation–sustainability divide.

Annexe 1 - Program Schedule and Resource Persons

As of 11 March 2012

08:00-09:00	***DAY ONE Registration***
09:00-10:20	Opening Plenary 1 - Adaptation in Action
ESCAP Hall	The opening plenary outlines the need for and challenges to action on adaptation. It discusses and Second Floor illustrates the key issues in shifting from deliberations to decisions, plans to policies, and policies to practices ***Welcome*** **Anna Lindstedt**, Ambassador for Climate Change, Ministry of the Environment, Government of Sweden **Shigemoto Kajihara**, Deputy Director-General of Global Environment, Ministry of Environment (MOEJ), Japan **Keith Alverson**, Head of Climate Change Adaptation and Terrestrial Ecosystems Branch and Climate Change Adaptation Unit, UNEP HQs, Kenya ***Ministerial Statements*** **Pithaya Pookaman**, Vice Minister of Natural Resources and Environment, Thailand ***Keynote Address*** **Bindu Lohani**, Vice President, Asian Development Bank (ADB), Philippines **Johan Kuylenstierna**, Executive Director Designate, Stockholm Environment Institute (SEI), Sweden ***Invited Speakers*** **Youssef Nassef**, Coordinator, Adaptation Programme, United Nations Framework Convention on Climate Change (UNFCCC), Germany **Byungwook Lee**, President, Korea Environment Institute (KEI), Former Vice Minister of Environment, Korea Youth Representative - **Dipesh Chapagain**, Co-founder/Program Coordinator, Nepalese Youth for Climate Action (NYCA), Clean Energy Nepal
10:20-11:00	Tea Break - In front of Conference Room 1
11:00-12:30	PARALLEL SESSION I **Policies, programs and plans**
The following panel sessions explore examples of adaptation in action with a focus on policies,programs and plans. Panels consider different levels and both the public and private sphere. Speakers will be given 7-10 minutes for opening remarks. After that facilitators will encourage exchange of view among panelists and responses to questions from the audience.	
11:00-12:30	Panel 1 International agreements and initiatives
ESCAP Hall, Second Floor	**Ulrika Åkesson**, First Secretary (Environment and Climate Change), Development Cooperation Section, Embassy of Sweden, Thailand **Youssef Nassef**, Coordinator, Adaptation Programme, United Nations Framework Convention on Climate Change (UNFCCC), Germany **Bonizella Biagini**, Head, Climate Change Adaptation Strategy and Operations, Global Environment Facility, USA **Damdin Davgadorj**, Mongolian Special Envoy for Climate Change, Ministry of Nature, Environment and Tourism, Mongolia **Izumi Kubota**, Senior Policy Researcher, National Institute for Environmental Studies (NIES), Japan

11:00-12:30	Panel 2 National policies, strategies and programs
Meeting Room A, First Floor	How has adaptation been effectively mainstreamed in national policies, strategies or programs? What, for example, has been learned from initial projects enabled by NAPA activities? How has horizontal coordination or cross-sectoral integration issues been handled? How have adaptation efforts been impacted by conventional development policies and practices, and vice-versa? **Dhruba Pant, Professor**, Nepal Engineering College **Sinh Bach Tan,** Director, National Institute for Science and Technology Policy and Strategic Studies (NISTPASS), Vietnam **Vidhisha N Samarasekara**, Senior Climate Change Specialist, India Resident Mission, Asian Development Bank (ADB),India **S M Munjurul Hannan Khan**, Deputy Secretary, Ministry of Environment and Forests, Bangladesh **Rebecca Nadin**, Director, Adapting to Climate Change, China Programme **Sanjay Tomar**, Senior Advisor, Natural Resource Management Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, India
11:00-12:30	Panel 3 Local government planning
Meeting Room G, First Floor	How are local governments taking adaptation to climate change into account in their plans and planning procedures? **Richard Friend**, Senior Staff Scientist, Institute for Social and Environmental Transition (ISET), Thailand **Christopher Kaczmarski**, Regional Technical Advisor on Local Development, UN Capital Development Fund (UNCDF), Thailand **Yanyong Inmuong**, Associate Professor, Faculty of Public Health, Khon Kaen University, Thailand **Ilona Porsché**, Project Director, Climate Change Adaptation in Rural Areas of India (CCA RAI), Natural Resources Management Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, India **Benoit Mayer**, PhD student, National University of Singapore
11:00-12:30	Panel 4 Private sector strategies, responsibilities and contributions
Meeting Room F, First Floor	How are private firms including adaptation to climate change in their core business strategies? How are their approaches similar and different from governments? How are they attempting to influence and contribute to public policy? **Louis Lebel**, Director, Unit for Social and Environmental Research, Chiang Mai University, Thailand **Leena Wokeck**, Director of the Asian Center for Corporate Social Responsibility, Thailand **Avijit Gautam**, Operations Head, Emergent Ventures International Pte. ltd,Thailand **Linda Yarr**, Director, Partnerships for International Strategies in Asia (PISA), Elliott School of International Affairs, The George Washington University, USA **Mohiuddin Babar**, Nature Alliance, Bangladesh **Wanida Supaporn**, Academic Officer, CSR department, PTT Public Company Limited, Thailand

11:00-12:30	Panel 5 Multi-level coordination
Meeting Room C & D, First Floor	How have countries tackled the challenge of coordinating policy, plans and programs on adaptation across administrative levels through to local residents? **Nguyen Huong Thuy Phan**, Programme Coordinator of the MRC Climate Change and Adaptation Initiative, Environment Division, Mekong River Commission Secretariat, Vientiane, Lao PDR **Purushottam Ghimire**, Joint Secretary, National Planning Commission Secretariat, Nepal **Changsub Shim**, Research Scientist, Korea Adaptation Center for Climate Change, Korean Environment Institute (KEI), Korea **Sonam Lhaden Khandu**, Senior Environment Officer, Climate Change Unit, National Environment Commission (NEC), Royal Government Bhutan **Christophe Béné**, Coordinator, Adaptive Social Protection Programme, Institute of Development Studies (IDS), UK **Suzzane Kelly-Lyall**, Deputy Director, Partnerships for International Strategies in Asia (PISA), Elliott School of International Affairs, The George Washington University, USA

11:00-12:30	Panel 6 Integrating adaptation and mitigation actions
Meeting Room E, First Floor	What are the effective ways of integrating adaptation and mitigation? What are the experiences with integration, for example, in designing energy systems, coastal management or agro-forestry? **Regan Suzuki**, REDD-net Coordinator, Asia Pacific, RECOFT - The Centre for People and Forest, Thailand **Fawad Khan**, Senior Associate, Institute for Social and Environmental Transition (ISET), Pakistan **Ei Ei Htun**, M&E Specialist, Mercy Corps, Myanmar **Simon Henschel**, Managing Director, Sunlabob International Pte., Ltd, Singapore **Raza M. Farrukh**, Senior Project Officer, Pakistan Resident Mission, Asian Development Bank (ADB)

11:00-12:30	Panel 6b Building climate resilient cities
Meeting Room B, First Floor	How are city and regional planners and authorities making cities more resilient to climate change? **Anna Brown**, Associate Director, The Rockefeller Foundation, Thailand **Bharat Dahiya**, Human Settlements Officer, UN-HABITAT,Thailand **Stephen Tyler**, Senior Associate, Institute for Social and Environmental Transition (ISET), Canada **Bhichit Rattakul**, Special Advisor, Asian Disaster Preparedness Centre (ADPC), Thailand **Isabel Pereira Rodrigues**, Research Fellow, Post-Doctoral, Center for Advanced Studies in Management and Economics (CEFAGE), University of Évora, Portugal

12:30-13:30	Lunch - Reception Area, Ground Floor
Meeting Room B, First Floor	Media Round Table: Strengthening Urban Capacity for Responding to Climate Change Impacts

13:30-15:00	PLENARY 2 - Insights from practice
ESCAP Hall, Second Floor	The second plenary will focus on what has been learnt from practice. It is therefore intended to be a pragmatic and initial response to the first plenary's outline of the issues and challenges in taking Adaptation ideas into practice. A facilitator will encourage exchange among panelists who will be asked to keep each intervention to less than 2-3 minutes. **Rajib Shaw**, Associate Professor, Kyoto University, Japan **Charles Rodgers**, Senior Environment Specialist (Climate Change Adaptation), Asian Development Bank (ADB), Philippines **Marcus Moench**, President, Institute for Social and Environmental Transition (ISET), USA **Ugyen Tshewang**, Secretary, National Environment Commission (NEC), Royal Government Bhutan **Kyosuke Inada**, Climate Change Advisor, Global Environment Department, Japan International Cooperation Agency (JICA), Japan
15:00-15:40	Tea Break - In front of Conference Room 1
15:40-17:00	PARALLEL SESSION II

The following sessions focus on practice in taking adaptation actions at different levels in diverse sectors, geographical zones and key stakeholder groups. All forum participants are welcome to join. Each session will start with a short introduction from the session coordinators setting scope and expected outcomes.

15:40-17:00	Panel 7 Managing water for food and agriculture
Meeting Room A, First Floor	How does improved management of water for food and agriculture support adaptation? **John Dore**, Senior Water Resources Advisor - Mekong Region, Australian Agency for International Development (AusAID), Lao PDR **Masataka Watanabe**, Professor, Graduate School of Media and Governance, Keio University, Japan **Wang Guoqing**, Professor, Nanjing Hydraulic Research Institute, Research Center for Climate Change, Ministry of Water Resources, China **Upali Imbulana**, Regional Coordinator, Global Water Partnership (GWP)- South Asia, Sri Lanka **Ancha Srinivasan**, Principal Climate Change Specialist, Asian Development Bank (ADB), Philippines

15:40-17:00	Panel 8 Disaster management and climate change adaptation
Meeting Room G, First Floor	How does effective disaster management support adaptation to climate change, and vice versa? **Hideyuki Mori**, President, Institute for Global Environmental Strategies (IGES), Japan **Shinano Hayashi**, Deputy Director, Institute for Global Environmental Strategies (IGES), Japan **Zeng Yunmin**, Director Assistant, GuangDong Academy of Social Science, China **Wijitbusaba Ann Marome**, Associate Dean of International Affairs, Faculty of Architecture and Planning, Thammasat University, Thailand **N.M.S.I. Arambepola**, Deputy Executive Director, Asian Disaster Preparedness Centre (ADPC), Thailand **Neil Britto**n, Principal Disaster Risk Management Specialist, Regional and Sustainable Development Department (RSDD), Asian Development Bank (ADB), Philippines

15:40-17:00	Panel 9 Community-based adaptation
Meeting Room C & D, First Floor	How do community-based actions support adaptation? **Atiq Rahman**, Executive Director, Bangladesh Center for Advanced Studies (BCAS), Bangladesh **Gehendra Bahadur Gurung**, Head of Programme Climate Change, Food Security, DRR, Practical Action, Nepal **Arivudai Nambi Appadurai**, Project Director, Climate Change Program, M.S.Swaminathan Research Foundation (MSSRF), India **Pinreak Suos**, National Advisor, NAPA Follow up Project, Environment and Energy Cluster, UNDP, Cambodia **Paramesh Nandy**, Project Manager, UNDP-BD Project of Ministry of Environment and Forest, Bangladesh **Arobindo Mahato**, Assistant Professor, Department of Rural Management and Development, Tripura University, India

15:40-17:00	Panel 9B Gender and adaptation mainstreaming
Meeting Room F, First Floor	How does gender matter for adaptation? Are women involved in making adaptation decisions? Are women's actions important for adaptation? **Bernadette P. Resurreccion**, Associate Professor, Gender & Development Studies, School of Environment, Resources & Development, Asian Institute of Technology (AIT), Thailand **Annemariie Reerink**, Gender Specialist, United Nations Development Programme (UNDP), Thailand **Jeremy Stickings**, Senior Social Development Specialist, Central and West Asia Department (CWAD), Asian Development Bank (ADB), Philippines **Pisith Sok**, Gender & Climate Change Committee, Ministry of Women Affairs, Royal Government of Cambodia **Bruce Ravesloot**, Senior Adaptation Advisor, Poverty, Environment and Climate Change Network Asia, CARE International,Thailand

15:40-17:00	Panel 10 Ecosystem management and ecosystem-based adaptation
Meeting Room E, First Floor	How do well managed ecosystems support adaptation? How has improved management of forests, wetlands and coastal ecosystems contributed to adaptation? **Keith Alverson**, Head of Climate Change Adaptation and Terrestrial Ecosystems Branch and Climate Change Adaptation Unit, UNEP HQs, Kenya **Robert Mather**, Head, South East Asia Group, The World Conservation Union (IUCN), Thailand **Sumit Pokhrel**, Energy/Climate Change Coordinator, GMS Core Environment Program, Environment Operations Center, Thailand **Sameer Karki**, Regional Technical Advisor, Ecosystems and Natural Resources Management, Thailand **Dethi Soumare Ndiaye**, Coordinator, Adaptation Fund Bureau, Centre de Suivi Ecologique (CSE), Senegal **Alamgir Khan Gandapur**, Project Director, Forest/Environment Department, Pakistan

15:40-17:00	Panel 12 Mainstream and Alternate media
ESCAP Hall, Second Floor	Has mainstream media or alternative media contributed enough to adaptation actions on climate change **Craig Hobbs**, CEO, Asia-Pacific Media Alliance for Social Awareness, Singapore **Joydeep Gupta**, Director, Third Pole Project, India **Ir. Johannes Jacobus Voordouw**, Coordinator of Programme, Panos Caribbean **Kunda Dixit**, Editor, Nepali Times, Kathmandu, Nepal **Jessica Cheam**, Environment Correspondent, The Straits Times, Singapore
17:00-18:30	Adaptation Film Festival
ESCAP Hall, Second Floor	Master of Ceremony: Stuart Ward, The Development Cooperation Section of the Embassy of Sweden in Bangkok Screening of the award winning films Award Ceremony with Khun Winai "Make" Kraibutr, famous Thai movie star to winners of the best Film Competition on Climate Change Adaptation Performance by Chinese Singer Ruhan - Dancing on a Rainbow & Time to Grow (Chinese and English) Talk by Kunda Dixit, Editor and Publisher - Nepali Times - Kathmandu on the Role of Media in Communicating Adaptation Award Ceremony with Khun Winai "Make" Kraibutr, famous Thai movie star to winners of the Best Media Reporting on Climate Change Adaptation Engaging with the Winners, Judges Performance by Chinese Singer Ruhan - The World We Leave Behind (Chinese)
18:30-19:30	Reception Area, Ground Floor Reception Supported by The Rockefeller Foundation

Day Two

09:00-10:20	Plenary 3 - Governance of adaptation
ESCAP Hall, Second Floor	The third plenary will focus on the governance of adaptation, addressing issues like how decisions should be made, who should pay, and what is fair. A facilitator will encourage exchange among panelists who will be asked to keep each intervention to less than 2-3 minutes. **Thomas Beloe**, Aid Effectiveness Specialist, United Nations Development Programme (UNDP), Thailand **Brian Dawson**, Senior Climate Change Advisor, The Secretariat of the Pacific Community (SPC), New Caledonia **Heather McGray**, Senior Associate, World Resources Institute (WRI), USA **David Jackson**, Head of Asia and Pacific Office, UN Capital Development Fund (UNCDF), Thailand **Sean Batten**, Director, Climate Change Policy and Adaptation, Australian Agency for International Development (AusAID), Australia
10:20-11:00	Tea Break
11:00-12:30	PARALLEL SESSION III
11:00-12:30	Panel 13 Decision-making, public participation and fairness
ESCAP Hall, Second Floor	How are decisions being made on how to adapt? Are the typical processes by which adaptation is governed fair? Is participation and representation of vulnerable groups sufficient? Are rights to adaptation being respected and access to justice provided to all social groups? **Prabhakar SVRK**, Senior Policy Researcher, Institute for Global Environmental Strategies (IGES), Japan **Frank Griffin**, Executive Dean, School of National and Physical Sciences, University of Papua New Guinea, Papua New Guinea **Ajaya Dixit**, Executive Director, Institute for Social and Environmental Transition (ISET), Nepal **Gurmit Singh**, K.S, Chairman, Center for Environment, Technology and Development, Malaysia (CETDEM), Malaysia **Akhilesh Gupta**, Scientist G, Adviser and Head, Climate Change Program, Department of Science & Technology, India **Paula Silva Villanueva**, M&E Technical Advisor, Institute of Development Studies (IDS), United Kingdom
11:00-12:30	Panel 14 Climate proofing infrastructure
Meeting Room A, First Floor	How are governments taking into account adaptation to climate change in the design and construction of transport and communication infrastructure? **James Roop**, Climate Change Advisor, AusAID, Australia **Norio Saito**, Senior Urban Development Specialist, Asian Development Bank (ADB), Philippines **H.E CHAN Darong**, Director General for Technical Affairs and Rural Roads Improvement Project's Director, Ministry of Rural Development, Cambodia **Benoit Laplante**, ADB Consultant, Climate Change Adaptation Economist, Philippines **Chloe Hanson-Boyd**, Climate Change Consultant, Sinclair Knight Merz, Australia

11:00-12:30	Panel 15 Public health and adaptation to climate change
Meeting Room G, First Floor	What are the public health priorities and implications of adaptation to climate change? **Jai P. Narain**, Director, Sustainable Development and Healthy Environment, South East Asian Regional Office (SEARO), World Health Organization (WHO), Thailand **Kien Tran-Mai**, Climate Change Programme Officer, Mekong River Commission Secretariat, Lao PDR **Tao Liu**, Assistant Researcher, Guangdong Institute of Public Health, Center for Disease Control and Prevention of Guangdong Province, China **Liz Hanna**, Fellow, National Centre for Epidemiology & Population Health, The Australian National University **Chung Hyen-Mi**, Technical Officer, Environmental Health, Western Pacific Regional Office (WPRO), World Health Organization (WHO) **Rikard Elfving**, Social Development Specialist, Asian Development Bank (ADB), Philippines

11:00-12:30	Panel 16 Financing adaptation
Meeting Room F, First Floor	Who should pay for adaptation? How should such decisions be made? What roles should insurance play in adaptation? Are there any other options for risk transfer? **Jonathan Shaw**, Deputy Director, Asian Institute of Technology - United Nations Environment Programme for Regional Resource Center in Asia and the Pacific (AIT-UNEP RRC.AP), Thailand **David McCauley**, Head, Climate Change Program Coordination Unit, Regional and Sustainable Development Department, Asian Development Bank (ADB), Philippines **Lurraine Villacorta**, Senior Project Coordinator, International Labour Organisation (ILO), Philippines **Bradford Philips**, Regional Climate Change Advisor, USAID Regional Development Mission, Thailand **Paul Steele**, Environment Advisor, UNDP Asia Pacific Regional Centre, Thailand **Aaron Atteridge**, Research Fellow, Stockholm Environment Institute (SEI), Sweden

11:00-12:30	Panel 17 Options for small island states
Meeting Room C & D, First Floor	What can small island states do? Who should help? **Brian Dawson**, Climate Change Advisor, The Secretariat of the Pacific Community (SPC), New Caledonia **Diane McFadzien**, Climate Change Adaptation Advisor, Secretariat of Pacific Regional Environment Programme (SPREP), Samoa **Yusuke Taishi**, Regional Technical Specialist – Adaptation, Green Low Emission Climate Resilient Development Strategies, UNDP APRC, Thailand **Ibrahim Naeem**, Director General, Environmental Protection Agency, Maldives **Nina Dwisasanti**, TELAPAK (Network of Environmental NGOs in Indonesia)

11:00-12:30	Panel 18 Climate induced migration and livelihood security
Meeting Room E, First Floor	What is the real significance of climate induced migration for efforts to adapt to climate change? How can the livelihoods of poor and vulnerable groups be best secured if migration happens or is necessary? **Sujatha Byravan**, Senior Fellow, Institute for Financial Management and Research, Chennai, India **Bart W. Édes**, Director Poverty Reduction, Gender, and Social Development Division, Regional and Sustainable Development Department Chair; Social Development & Poverty CoP, Asian Development Bank (ADB), Philippines **Francois Gemenne**, Research Fellow, Institute for Sustainable Development and International Relations (IDDRI), France **Rathana Peou Van Den Heuvel**, Associate Professor and Deputy Director, Institute for Sustainable Development, University of Liberal Arts, Dhaka, Bangladesh **Dina Ionesco**, Policy Officer, International Cooperation and Partnerships, International Organization for Migration (IOM), Switzerland **Lailai Li**, Senior Research Fellow, Stockholm Environment Institute, China
12:30-13:30	Lunch - Reception Area, Ground Floor
Meeting Room G, First Floor	Drop-in Demonstration Sessions of Climate Change Compatible User Guide by CDKN & IDS
13:30-15:00	PARALLEL SESSION IV
13:30-15:00	Panel 19 Experiences in the IPCC
ESCAP Hall, Second Floor	What do the experiences of the IPCC tell us about barriers and opportunities to effectively linking knowledge and action on adaptation? **Darin Klong-ugkara**, News Anchor, Thai Public Broadcasting Service (Thai PBS), Thailand **Saleemul Huq**, Senior Fellow, Climate Change Group, International Institute for Environment and Development (IIED), UK **Joy J. Pereira**, Professor, Southeast Asia Disaster Prevention Research Institute (SEADPRI-UKM), Universiti Kebangsaan, Malaysia **Mozaharul Alam**, Regional Climate Change Coordinator, United Nations Environment Programme (UNEP), Regional Office for Asia and the Pacific, Thailand **Seree Supratid**, The Sirindhorn International Environmental Park, Thailand
13:30-15:00	Panel 20 South - South Learning across world regions
Meeting Room A, First Floor	What can different regions of the world learn from each other about linking knowledge and action for climate change adaptation? Critical reflections on the workshop from the perspective of those living and working outside the region. **Baas Brimer**, Attaché in Cooperation, Delegation of the European Union to Lao PDR **Gernot Laganda**, Regional Technical Advisor, Climate Change Adaptation, UNDP Asia-Pacific Regional Centre, Thailand **Kim Myoung Shin**, Assistant Programme Specialist, Korean National Commission for UNESCO, Republic of Korea **Karen Bernard**, Programme Specialist, Disaster Risk Reduction & Recovery, United Nations Development Programme (UNDP) Pacific Centre, Suva, Fiji Islands **Gulzhamal Issayeva**, Senior Programme Specialist, The Regional Environment Center for Central Asia (CAREC), Kazakhstan

13:30-15:00	Panel 21 Local and experience-based Knowledge
Meeting Room G, First Floor	How do different knowledge management approaches and tools support adaptation actions? How is local, indigenous and experience-based knowledge important to adaptation action? **Fatema Rajabali**, Climate Change Convener, Institute of Development Studies (IDS), University of Sussex, United Kingdom **Ali Tauqeer Sheikh**, CEO & National Program Director, LEAD Pakistan and Director Asia, Climate and Development Knowledge Management (CDKN), Pakistan **Sanat Kumar Chakraborty**, Editor, Grassroots Options, India **Manohar Dubey**, Executive Director, Environmental Planning and Coordination Organization (EPCO), India

13:30-15:00	Panel 22 Synergies between adaptation toolkits and methods in practice
Meeting Room F, First Floor	What has been learnt from using adaptation toolkits in practice? How can they be combined or further improved for greater effectiveness? **Dhrupad Choudhury**, Action Area Team Leader, Innovative Livelihood Options & Grant Coordinator (IFAD), International Centre for Integrated Mountain Development (ICIMOD), Nepal **Jonathan Shott**, Project Manager and Disaster Management Consultant, Sustainable Development Foundation, Thailand **Oyuntuya Sharavjamts**, Vice Director of School of Ecology and Technology Development, Mongolian State University of Agriculture (MSUA), Mongolia **Rachna Arora**,Technical Advisor, Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ), India **Kenya Kono**, Programme Officer, FAO Regional Office for Asia and the Pacific, Thailand

13:30-15:00	Panel 23: Provision and application of climate information
Meeting Room C & D, First Floor	What climate data and information are needed to enable informed adaptation planning? What are the current practices in the provision, dissemination and application of climate data and information? What are the challenges of and emerging opportunities for applying relevant climate information to support adaptation? **Xianfu Lu**, Climate Change Adaptation Specialist, Asian Development Bank/UNFCCC, Philippines **Yinlong Xu**, Professor, Institute of Environment and Sustainable Development in Agriculture (IEDA), Chinese Academy of Agricultural Sciences (CAAS), China **Charles Rodgers**, Senior Environment Specialist (Climate Change Adaptation), Asian Development Bank (ADB), Philippines **Pradeep Kurukulasuriya**, Senior Technical Advisor, Strategies and Adaptation, United Nations Development Programme (UNDP), Thailand **Senaka Basnayake**, Department Head, Climate Change and Climate Risk Management, Asian Disaster Preparedness Centre (ADPC),Thailand **John McGregor**, Senior Principal Research Scientist,CSIRO Marine and Atmospheric Research, Australia **Suppakorn Chinvanno**, SEA-START, Thailand

13:30-15:00	Panel 24 Youth and Adaptation
Meeting Room E, First Floor	How have youth-led, -driven or –oriented activities contributed to adaptation actions? How has the education system served youth's needs for climate change adaptation knowledge? **Tek Jung Mahat**, Project Manager, International Centre for Integrated Mountain Development (ICIMOD), Nepal **Sanjay Vashis**t, Director, Climate Action Network South Asia (CANSA), South Asia **Craig Hobbs**, CEO, Asia-Pacific Media Alliance for Social Awareness, Singapore **Lucia Grenna**, World Bank **Tanzima Shahreen**, Communication and Outreach Expert/Junior Research Assistant, Boishakhi Television, Unnayan Onneshan, Bangladesh **Kevin Charles Kettle**, Project Development Officer, SEAMEO SPAFA, Thailand
15:00-15:30	Tea Break - In front of Conference Room 1
15:30-16:45	PLENARY 4 – Linking knowledge and action
ESCAP Hall, Second Floor	Linking knowledge to adaptation actions: What are the effective ways of better linking knowledge and action for adaptation to climate change? **Monthip Tabucanon**, The Royal Institute of Thailand, Former Director General, Department of Environmental Quality Promotion, Thailand **Saleemul Huq**, Senior Fellow, Climate Change Group, International Institute for Environment and Development (IIED), United Kingdom **Kazuya Yasuhara**, Professor Emeritus, Ibaraki University, Japan **Victorino Aquitania**, Regional Director, Southeast Asia Secretariat, ICLEI - Local Governments for Sustainability, Philippines
16:45-17:30	CLOSING CEREMONY
ESCAP Hall, Second Floor	Youth Representative: **Tian Wang,** Student, Forestry and Environmental Studies, Yale University, USA **Ahmed Saleem**, Permanent Secretary, Ministry of Housing and Environment, Maldives **Said Irandoust**, President, Asian Institute of Technology (AIT), Thailand **Hideyuki Mori**, President, Institute for Global Environmental Strategies (IGES), Japan **AnnaMaria Oltorp**, Counsellor, Head of Development Cooperation Section, Embassy of Sweden, Thailand

Annexe 2 - Market Place

32 organizations set up exhibits and information booths in the Forum Market Place.[221] Booths covered work of Non-governmental, academic, donor and multilateral organizations as well as various collaborative projects. The following are the organisations that took part in the Market Place.

Market Place Participants
Adaptation Knowledge Platform A
Adapting to Climate Change in China (ACCC) Project
AIT Extension
AIT-UNEP Regional Resource Centre for Asia and the Pacific
Asia Pacific Adaptation Network
Asian Development Bank (ADB)
Asian Disaster Preparedness Center (ADPC)
Center for Natural Resources Studies (CNRS)
Center of Excellence on Sustainable Development in the context of Climate Change, AIT
Climate Change Adaptation in Rural Areas of India (CCA RAI)
Climate Development Knowledge Network (CDKN)
Department of Environment, Ministry of Natural Resources and Environment, Lao PDR
Forum Syd / Cord / DCA
Institute for Global Environment Strategies (IGES)
Institute for Social and Environmental Transition (ISET)
Institute of Development Studies (IDS)
IUCN and Mangroves for the Future
Keio University
Korea Environment Institute (KEI) / Korea Adaptation Center for Climate Change (KACCC)
Mekong River Commission (MRC)
Pact
Partners for Resilience / IFRC
Partnership for International Strategies in Asia (PISA)
Raks Thai Foundation, CARE International and ELAN Teams
Regional Initiatives on Climate Change Education
Save the Children
South-South Cooperation between SIDS on CCA and DRM
Stockholm Environment Institute - Asia
United nations Development Programme (UNDP)
United Nations Environment Programme (UNEP)
UN-HABITAT
USAID | Climate Change Adaptation Project Preparation Facility for Asia and the Pacific (ADAPT Asia-Pacific)

Annexe 3 - Sources and Notes

[1] Keith Alverson quoted in : Asia Pacific Adaptation E-Commuique, Issue 16, March 2012

[2] Dipesh Chapagain, Plenary 1

[3] Youssef Nasef, Briefing Notes, p10

[4] Paul Steele, Panel 1

[5] Izumi Kubota, Panel 1

[6] Damdin Davgadorj, Panel 1

[7] Peter King, Ornasaran Manuamorn, Maria Milagros Ballesteros, Briefing Note, p5

[8] Youssef Nasef, Briefing Notes, p10

[9] Young-woo Park, Summary, Plenary 3

[10] Rebecca Nadin, Sanjay Tomor and discussants, Panel 2

[11] Bach Tan Sinh, Panel 2

[12] Vidhisha Samarasekara, Panel 2

[13] See: ADB. 2010. National climate change adaptation strategy for Sri Lanka 2011 to 2016. Final Draft, 16 November 2010. On-line: http://www.adb.org/Documents/Produced-Under-TA/43173/43173-01-sri-dpta-07.pdf

Asian Development Bank, Manila.

[14] Rebecca Nadin, Panel 2

[15] Young-woo Park, Summary, Plenary 3

[16] Christopher Kaczmarksi, Panel 3

[17] Discussions, Panel 3

[18] Christopher Kaczmarksi and discussant, Panel 3

[19] Christopher Kaczmarksi, Panel 3

[20] Yanyong Inmuong, Panel 3

[21] Ilona Porsche, Panel 3

[22] Richard Friend, Panel 3

[23] Louis Lebel, Panel 4

[24] Avijit Gautum, Panel 4

[25] Discussant, Panel 4

[26] Leena Wokeck, Panel 4

[27] Gareth Johnston, Panel 4

[28] Various discussants, Panel 4

[29] Avijit Gautum, Panel 4

[30] Mohiuddin Babar, Panel 4

[31] Mohiuddin Babar, Panel 4

[32] Linda Yarr, Panel 4

[33] Mohiuddin Babar, Panel 4

[34] Gareth Johnston, Panel 4

[35] Mohiuddin Babar, Panel 4

[36] Leena Wokeck, Panel 4

[37] Suzanne Kelly-Lyall, Panel 5

[38] Nguyen Huong Thuy Phan, Panel 5

[39] Purushottam Ghimire, Panel 5

[40] Changsub Shim, Panel 5

[41] Christophe Béne, Panel 5

[42] Youssef Nassef quoted in : Asia Pacific Adaptation E-Commuique, Issue 16, March 2012

[43] Saleem Huq, closing plenary

[44] Fawad Khan, Panel 6

[45] Ei Ei Htun, Panel 6

[46] Ei Ei Htun quoted in : Asia Pacific Adaptation E-Commuique, Issue 16, March 2012

[47] Decharut Sukkumnoed, Briefing Notes, p59

[48] Josephine Rabanal Migalbin, Briefing Notes, p65

[49] Regan Suzuki, Panel 6

[50] Georgius Joseph Viandrito, Briefing Notes, p60

[51] Baharat Dahiya, Panel 6b

[52] Stephen Tyler, Panel 6b

[53] Anna Brown quoted in : Asia Pacific Adaptation E-Commuique, Issue 16, March 2012

[54] Steve Tyler, Round Table (Quoted in Inter Press Services article by Manipadma Jena See: ipsnews.net/print.asp?idnews=107212

[55] Yousef Nassef, Round Table

[56] Jonathan Shaw, RoundTable

[57] Gabrielle Iglesias, Panel 6b

[58] Isabel Pereira Rodrigues, Panel 6b

[59] Ole Fryd, Briefing Notes, p42

[60] Pornpun Pinweha, Briefing Notes, p57

[61] Richard Friend quoted in : Asia Pacific Adaptation E-Commuique, Issue 16, March 2012

[62] Saleem Huq, closing plenary

[63] Marcus Moensch and Kai Kim Chiang, Briefing Notes, pg 45

[64] Kyosuke Inada, Plenary 2

[65] Masataka Watanabe, Panel 7

[66] Last part is my addition

[67] Upali Imbulana, Panel 7

[68] Ancha Srinivasan, Panel 7

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[70] Louis Lebel, Briefing Notes

[71] Discussants, Panel 7

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[73] Neil Britton, Panel 8
[74] Shinano Hayashi, Panel 8
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[106] Kunda Dixit, Panel 12
[107] Jessica Cheam, Panel 12
[108] Johannes Jacobus Voordouw, Panel 12
[109] See video clip, Voices for Climate Changes: www.youtube.com/watch?v=M-5NGTSzTJs
[110] Joydeep Gupta, Panel 12
[111] Thomas Beloe, Plenary 3
[112] Frank Griffin, Panel 13
[113] Muangpong Juntopas, Panel 13
[114] Gurmit Singh, Panel 13
[115] Gurmit Singh, Panel 13
[116] Atiq Rahman, Panel 13
[117] SVRK Prabhakar, Panel 13 and in: Asia Pacific Adaptation E-Commuique, Issue 16, March 2012
[118] Discussant, Panel 13
[119] Bindu Lohani, opening plenary
[120] Norio Saito, Panel 14
[121] H.E. Chan Darong, Panel 14
[122] Chloe Hanson-Body, Panel 14
[123] See: www.pacificclimatefutures.net
[124] Benoit Laplante, Plenary 14
[125] Benoit Laplante, Plenary 14
[126] Benoit Laplante, Plenary 14
[127] Hyen-Mi Chung, Panel 15
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[131] Liz Hanna, Panel 15
[132] Kien Tran-Mai, Panel 15
[133] Tao Liu, Panel 15
[134] Ali Shafqat Akanda, Briefing Notes, p153
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[136] Liz Hanna, Panel 15
[137] Jai P. Narain, Panel 15
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[140] Hyen-Mi Chung, Panel 15
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[142] Rikard Elfving, Panel 15
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[144] David McCauley, Panel 16
[145] Bonizella Biagini, Panel 16
[146] Lurraine Villacorta, Panel 16
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[155] Bradford Philips, Panel 16

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[157] Lurraine Villacorta, Panel 16

[158] Lurraine Villacorta, Panel 16

[159] David McCauley, Panel 16

[160] David Jackson (discussant), Panel 16

[161] Aaron Atteridge, Panel 16

[162] Diane McFadzien, Panel 17

[163] Annika Dean, Briefing Notes, p8

[164] Annika Dean, Briefing Notes, p8

[165] Diane McFadzien, Panel 17

[166] Poh Poh Wong, Briefing Notes, p157

[167] Yusuke Taishi, Panel 17

[168] Ibrahim Naeem, Panel 17

[169] ADB. 2012. Addressing Climate Change and Migration in Asia and the Pacific. Asian Development Bank, Manila.

[170] Nina Dwisasanti and discussants, Panel 17

[171] Benoit Mayer, Panel 2

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[173] Dina Ionesco, Panel 18

[174] Francois Gemenne, Panel 18

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[176] Dina Ionesco, Panel 18

[177] Sujatha Byravan, Panel 18

[178] Lailai Li, Panel 18

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[181] Darin Klong-ugkara, Panel 19

[182] Joy Jacqueline Pereira, Panel 19

[183] Mozaharul Alum, Panel 19

[184] Karen Bernard, Panel 20

[185] Gulzhamal Issayeva, Panel 20

[186] Karen Bernard, Briefing Notes, p162

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[189] Sanat Kumar Chakraborty, Panel 21

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[197] Oyuntuya Sharavjamts, Panel 22

[198] Kenya Kono, Panel 22

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[200] Rachna Arora, Panel 22

[201] Jonathan Shott, Panel 22

[202] Dhrupad Choudhury, Panel 22

[203] Suppakorn Chinvanno, Panel 23

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[214] Sanjay Vashist, Panel 24

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[216] Craig Hobbs, Panel 24

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Adaptation Forum 2012 Secretariat
AIT-UNEP Regional Resource Centre for Asia and the Pacific
Outreach Building, P.O. Box 4, Klong Luang
Pathumthani 12120, Thailand
Tel: +662 524 5386/5384
Email: info@climateadapt.asia
Website: http://www.climateadapt.asia
Forum Website: http://www.asiapacificadapt.net/adaptationforum2012/

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