

**PROCEEDINGS REPORT:  
CLIMATE CHANGE ADAPTATION TRAINING  
20 – 21 SEPTEMBER 2012  
KUALA LUMPUR, MALAYSIA**



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## EXECUTIVE SUMMARY

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The 2-day training on Climate Change Adaptation Planning held on 20-21 September 2012 in Royale Bintang, Kuala Lumpur, Malaysia was attended by 22 participants from nine Southeast Asia countries: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore and Vietnam. Majority are representing the climate change offices in their respective country with some coming from the local government and academe.

Discussion covered a brief refresher on climate change in the region, climate change adaptation, mainstreaming climate change adaptation into development planning, the different technologies on adaptation, role of science and prioritisation of measures. For each topic, a resource speaker provided an input followed by a brief question and answer to clarify some concerns from the participants.

On the first day, it was explained to the participants that the training is part of APAN's efforts in trying to capacitate people to know about science and adaptation, know how to do the planning on the ground and know what are the emerging issues related to climate change adaptation. The training is a combination of the basics and the new or emerging issues related to climate change adaptation. This is very important since Southeast Asia is vulnerable to the different impacts of climate change and six countries from the region are identified as climate change "hotspot", namely, Philippines, Vietnam, Cambodia, Lao PDR, Thailand and Indonesia. Thus, this should be addressed not just at the local or national level, but at the regional level as well.

Therefore, it is very important that there should be cooperation between climate change offices in the region and that there is a need to strengthen the information flow so that the policies and plans can be more efficiently and effectively be done to battle climate change. Aside from these, climate change issues should be mainstreamed into national strategies and development planning. And this is a challenge for the different countries as there have already been various efforts to do so using different entry points to mainstream climate change adaptation in development planning.

There was an agreement amongst the participants that development planning takes different forms and that it is multi-level, multi-sectoral, and multi-period. Each country has a different approach in development planning including the process but there is no need to create a different process but just to enhance the existing one.

The Philippine experience in mainstreaming was presented. It was pointed out that the government continues to face challenges in the mainstreaming of climate change adaptation and mitigation into national, sectoral and local planning and development activities. Some of these major bottlenecks are: lack of common understanding among some important stakeholders, insufficient technical capacity in most of the government units (national and local), lack of properly managed knowledge/data, lack or inadequate financing strategies for implementation which still hinders the improvement of adaptive capacities of local communities and natural systems against the impact of climate change and disasters.

Another experience on mainstreaming was also presented by Baguio City, this time, at the local level. The city government takes the lead in all initiatives in mainstreaming

climate change and then involving communities, strengthen partnerships with the NGOs and the private sector and the academe and adjoining LGUs

On the second day of the training wherein there were group exercises on mainstreaming and prioritization, the groups identified some entry points that they used for mainstreaming such as the NAPAs, development plans and water resource management plans. A common constraint is the limited budget.

During the discussions, it was also pointed out the need for capacity building on the following:

- Public awareness through media, manuals, training and education,
- Technological transfer,
- Enhancing cooperation at the national, regional and international levels, and,
- Data archiving for sharing information which should be consistent and available.

Science' role in climate change adaptation was also emphasized. It is very important for an informed policy-making, decision-making and identifying options including what technology to use on a specific condition. Some technologies being implemented or planned in Cambodia and Thailand were presented. These technologies were based on the results of the technology needs assessment conducted.

Despite this, countries still encounter challenges for the development of adaptation technologies such as (1) technologies' lack of specific data/information, (2) capacity is limited and need to improve capacity on CC adaptation technology for all identified technologies, (3) estimation of adaptation cost and benefits, (4) involvement of all relevant stakeholders, (5) policies and strategies to remove barriers and (6) procedures to access international bilateral and multilateral financing.

A lesson shared during the training was that at the local level, climate change adaptation planning should be based on rather unique or specific context of the community or landscape and that community-based adaptation strategies can help rural communities strengthen their capacity to cope with disasters and improve their adaptive capacity.

As mentioned earlier, mainstreaming is not a single step process. It should also be stressed that the adaptation process is a cycle. It should keep on improving. It is important to keep on assessing adaptation measures, the tools needed in analysing adaptation measures and identifying priorities. Not all measures can satisfy all the assessment criteria and a combination of tools may be needed as each have their own strengths and weaknesses in a particular area but the measures selected should have implications for strategic issues.

To further emphasize on the importance of the activity, a brief introduction on APAN was presented. The network, APAN, is aiming at institutional capacity, knowledge mobilization and demonstration and dissemination of best adaptation practices among others. The training is just one of the various activities that the network is conducting. A climate change adaptation web portal is also available, which is a database on good adaptation practices and technologies from the region. An on- going activity related to this is the development of a database which will be used as a simplified map for a wide range of technologies on climate adaptation. This will promote a smooth formulation and implementation of adaptation policy at the national or local level.

The training ended on a note that APAN welcomes suggestions or feedbacks that could improve the activities and plans towards the attainment of the network's aims.

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## RATIONALE

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Southeast Asia is annually affected by climate extremes, particularly floods, droughts and tropical cyclones, while large areas of the region are highly prone to flooding and influenced by moonsons. The IPCC 4th Assessment Report states that Southeast Asia is expected to be seriously affected by the adverse impacts of climate change since most economies are relying on agriculture and natural resources. Recognizing these threats and feeling the impacts, Southeast Asian nations know that climate change adaptation is necessary and have initiated various efforts to respond thru policies and programs.

>

Though many initiatives are already underway in the region, there are large gaps in knowledge regarding climate change adaptation (CCA), in the coordination/cooperation between key institutions and stakeholders working in the countries and the region on CCA, capacity to undertake CCA activities, technologies for CCA and also in accessibility to funds for CCA. One of the keys to reducing vulnerability to climate change is effective implementation of adaptation and capacity building actions.

United Nations Environment Programme (UNEP), in partnership with key UN and other international and bilateral agencies, is facilitating the development of the Global Climate Change Adaptation Network (GAN). The development of the Global Network is a response to the call by UNFCCC SBSTA, which at its 28th Session “recognized that regional centers and networks undertaking work relevant to climate change play an important role in enhancing adaptation” and “agreed to promote existing networks for impacts, vulnerability and adaptation and encouraged the establishment of new networks.”

Based on the several consultation meetings, the Asia Pacific Adaptation Network (APAN) was launched in Bangkok as a part of the GAN by the Prime Minister of Thailand in October 2009 and began its implementation in March 2010. APAN aims to facilitate adaptation capacity building, policy-setting, planning and practices through the mobilization and sharing of knowledge and technologies, with the ultimate aim of helping countries in the region to build climate resilience of vulnerable human systems, ecosystems and economies.

On February 2012, APAN, together with UNEP and ICLEI, the sub-regional node for Southeast Asia held a Consultation Meeting and a Training Workshop on Climate Change Mitigation and Adaptation in Ortigas Center, Pasig City, Metro Manila, Philippines. During these events, participants identified the gaps and needs of their respective national and local governments in climate change adaptation.

To further identify the appropriate interventions in Southeast Asia, APAN, through ICLEI, conducted a study on the gaps and needs on climate change adaptation in the sub-region. The study reveals that a barrier for Southeast Asian countries is the lack of required institutions in Climate Change Mitigation and Adaptation both at the national and local levels. The interventions necessary range from (1)

formulating policy at various levels, each aligned and strengthening the other, (2) capacitating the individuals, and (3) ensuring the availability of financing. In relation to capacity-building, a priority gap and need identified is the institutional capacity in mainstreaming adaptation into the development process including knowledge and application of different adaptation technologies.

As a continuation of APAN's capacity-building efforts and in addressing needs in Southeast Asia, a Training on Climate Change Adaptation Planning was held in Kuala Lumpur, Malaysia on 20-21 September 2012.

### General Objective

This training aims to improve the capacity of national and local authorities in mainstreaming climate change adaptation in development planning.

### Specific Objectives

1. Provide general concepts on impacts of climate change, and climate change adaptation.
2. Discuss different approaches of climate change adaptation at regional and national levels.
3. Provide examples on adaptation technologies in vulnerable sectors and areas such as socio-economic, agriculture, and water.
4. Provide guidance on mainstreaming and integrating adaptation into national and local planning processes.
5. Provide guidance on prioritizing adaptation measures.

### Expected Results

1. Enhanced understanding regarding the general concepts on impacts of climate change, and climate adaptation.
2. Knowledge of different approaches of climate change adaptation
3. Through the examples, understand the practical adaptation in most vulnerable sectors and areas
4. Be able to bring in or integrate adaptation approaches into their national and local planning processes
5. Knowledge on prioritizing adaptation measures.



### OPENING REMARKS

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**Mr. Mozaharul Alam**  
**Regional Climate Change Coordinator**  
**Regional Office for Asia and the Pacific (ROAP)**  
**United Nations Environment Programme (UNEP)**

Mr. Alam acknowledged the new faces attending the training because he is used to see most of the known faces from the scientific and negotiating committee. In relation to this, he said that having new faces is basically important when looking on climate change and adaptation in particular to cut across different sectors and the need to capacitate new people to learn climate change adaptation because this is not a small issue back at home. This is what APAN is trying to deliver; to enhance the capacity for people to know about science and



adaptation, to know how to do the planning on the ground and to know what are the emerging issues related to the climate change adaptation. He added that the training is a combination of the basics and the new or emerging issues that need to be handled.

With climate change adaptation and the different buzzwords, of which, having different meaning and context, Mr Alam urged the participants to raise questions to get more clarity on the issues and have a greater understanding of what is meant by the buzzwords. There must be a common understanding of a particular climate change issue on the ground and on connecting to the regional or international level or community. He stressed that what we understand and what the global community understand is the most important.

Finally, he mentioned that APAN is on its 3rd year and is hopeful to continue the network and provide continued support to all the ASEAN countries as well as the four other regions in the Asia Pacific. Southeast Asia is one of the important regions in terms of climate change because of its vulnerability and the different initiatives that are taking shape to address climate change.

**Mr. Purnomo Dwi Sasongko**  
**Semarang Development and Planning Board**  
**ICLEI Southeast Asia Regional Executive Committee**  
**Member**

As a member of the Regional Executive Committee for Southeast Asia of ICLEI, Mr. Purnomo wished everyone to enjoy and learn from the training. Since it seems that everyone is already familiar with, this training on integration of CCA into development planning can contribute further into the participants' knowledge. He added further that this training is important to improve the implementation of CCA in Southeast Asia.



## **CLIMATE CHANGE IN SOUTHEAST ASIA: A REFRESHER**

**DR. PUJA SAWHNEY**  
**COORDINATOR**  
**ASIA PACIFIC ADAPTATION NETWORK**

Dr. Puja Sawhney started her discussion on Climate Change in Southeast Asia with



the basic information on climate change and some models, predictions and scenarios on surface warming. She mentioned that Singapore, followed by Thailand and Vietnam has the highest increase in temperature in the region.

Impacts of climate change on ecosystem, economies and communities, average temperature, weather and water resources were then discussed.

She cited the Southeast Asia region as vulnerable to the different impacts of climate change with the region having high concentration of its population and economic activities in the coastal areas, heavy reliance on agriculture for providing livelihoods and dependence on natural resources and forestry. Furthermore, the Philippines, Vietnam, Cambodia, Lao PDR, Thailand and Indonesia are identified as climate change "hotspot" and will be hardest hit by 2030 of extreme climate with more floods drought and cyclones, wild monsoon variations and sea-level rise. It is a reality check and it is only 18 years down the line, she added.

According to Dr. Sawhney, challenges in the fight for climate change include the rapid urbanization and population growth of which correlates to high energy demands. The region contributed 12% of the world's GHG emissions, an increase of 27% from 1990. In addition, the region lacks a coherent regional policy,

participation from the public and involvement of the private/corporate sector in fighting climate change.

From challenges, Dr. Sawhney proceeded to the discussion on adaptation and mitigation including various adaptation and mitigation measures. She also showed a graphic representation of the adaptive capacity of countries in the Southeast Asia region which showed that some countries have less adaptive capacity than others. Although mitigation is already being explored in Southeast Asia, adaptation continues to be important.

In conclusion, for climate change adaptation, costs of the unavoidable impact of GHG emissions into the climate system should be minimized, and explore affordable and cost effective mitigation measures and pursue a low-carbon growth strategy. In order to accomplish these, (1) there should be an enhanced cooperation through regional and sub-regional bodies, (2) climate change issues mainstreamed into national strategies and development planning, and (3) there should be cooperation between the national climate change office, sectoral/technical departments and planning ministry.

## Q&A

**Audrey Huang:**

***You have mentioned earthquake as one of the impacts, how it is related to climate change?***

**Puja Sawhney:**

Earthquakes are natural phenomenon. They have been occurring but that is also the case of climate change. Naturally the climate has been changing. What is happening is because of human activity, they have been exacerbated. For earthquake it is difficult to predict at the moment but there are signs that there could be a difference between the two. We don't know everything that has been going on as of the moment. They are all interlinked, nothing happens in isolation. So everything does have an effect on each other.

**Audrey Huang:**

You said that regional policies are important in adaptation, could you elaborate what kind of regional policies you are looking at?

**Puja Sawhney:**

Right now we are looking at national policies. Actually ASEAN is already looking at it and considering climate change at the regional level but what is required is both at the national and the regional level. What APAN is actually looking at right now is the cooperation between the climate change offices.

Within the country itself, there is gap between the coordination and understanding. So the planning which is done by the planning commission is separated by the sectoral and technical department and what goes up to the climate change office. There is actually a need for better coordination so that you have better coordinated policies at the national and that also has implications at the regional level. A lot

is happening at the national level yet there is lack of coordination in it. So in the regional level there is a gap of information among the participants. Thus, there is a need to strengthen that information flow so that the policies and plans can be more efficiently and effectively be done to battle climate change.

### **Mozaharul Alam:**

Let me just add to the regional aspect of adaptation. One is if you look at the large river basin which actually goes beyond the country's administrative and political boundaries where the system shares common features. If you look at the Mekong as a watershed, the challenge basically is at every country if any changes happen in that large water basin. That needs to be handled not by a single country but by the region. That is one dimension of what regional adaptation can be done to a regional intervention either to the policy or resource or to a collective action so that it can be handled at that landscape level.

The second area is when you are talking about the food security and that is change of food from one country to another. What the South Asian Regional Cooperation has agreed is to create a food basket for the whole region so that when a disaster or anything happened then they will be able to transport that food to the other countries. This is another example where we can think about the regional approach where not necessarily every country will get equal benefit out of that action but can help each other.

## **CLIMATE CHANGE ADAPTATION: AN OVERVIEW**

### **MR. MOZAHARUL ALAM**

#### **REGIONAL CLIMATE CHANGE COORDINATOR**

#### **REGIONAL OFFICE FOR ASIA AND THE PACIFIC (ROAP)**

#### **UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)**

Mr. Alam started his presentation by showing the climate change adaptation and mitigation linkages and the terminologies/concept developed by IPCC. This is to have common understanding and clarity on the terminologies and issues used in relation to climate change to level off the understanding of climate participants and the understanding of the scientific community. The terminologies explained were: exposure, sensitivity, adaptive capacity, vulnerability, adaptation, resilience and technology. He said that the words are interconnected with one another. The second part of Mr. Alam's presentation was the types of



adaptation and the categories of adaptation actions. The adaptation types are anticipatory, autonomous and planned types of adaptation of which the natural

and human systems were compared. And the categories of adaptation actions as suggested by IPCC are: bear losses, share losses, modify the threat, prevent effects, change use and change location.

He then talked about adaptation at the policy perspective at the global and national level. At the global level, it provides the overall guidance, strategy and framework. He used the National Adaptation Programme of Action (NAPA) as an example and it has available funding. At the national level where adaptation happens, it needs the readiness in terms of policy, strategy and mainstreaming to access the funds.

Next, he discussed the challenges and opportunities for adaptation. For challenges, first, there is insufficient information and knowledge on the impacts of climate change and responses of natural systems to climate change. These impacts differ from one location to another and the level of the exposure of the system is required in assessment. Second, are the limited studies on the interconnections between adaptation and mitigation options, costs and benefits of adaptation, and trade-offs between various courses of actions and third, the absence of information on adaptation costs and benefits makes it difficult to undertake the best adaptation option.

For opportunities, first, it is politically high in the agenda and recognition of implication on development. Second, the development of new institutional setup to coordinate climate change, and third, provisions for finance, technology, and capacity building and fourth, development is in progress and integrating climate change will support sustainable development.

Lastly, he emphasized to select an adaptation option that can provide multiple benefits and can address multiple areas in climate change, environmental sustainability and disaster risk reduction and not those in isolation.

## **INTEGRATING CCA INTO DEVELOPMENT PLANNING**

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**MR. MARINO DEOCARIZA**  
**ENVIRONMENTAL PLANNER**  
**UNIVERSITY OF THE PHILIPPINES**

In the afternoon session, Mr. Marino Deocariza gave his presentation on integrating climate change adaptation in development planning. He mentioned that development planning is multi-level, multi-sectoral and multi-period. It can be interlinked with other plans and drives resource allocation, programs, projects and actions.

In the Philippine setting, there are 5 different development sectors – environment, social, economic, infrastructure and institutional. Each sector are then analysed and all analyses fits into the process of planning to come up with an action plan or a development plan.



The next part of Mr. Deocariza's presentation is mainstreaming. It is about integrating a principle or a process into the planning system. It does not require the creation of new systems but enhances existing ones. The importance of mainstreaming is the entry points. It is critical to teach people to mainstream climate change adaptation into plans. Furthermore, he said that mainstreaming is not an instant or one-step process. It needs conditions and it takes a lot of years and takes a lot of cooperation from several sectors especially the policy makers, planners and information agencies like researchers and universities and civil society groups to develop a fully mainstreamed climate

change adaptation into plans. Information has a wide range of consequences that is why an expert study is important in the mainstreaming process.

However, there are problems that are needed to be considered in mainstreaming at the local level and these are: overwhelming local responsibility, lack of personnel, lack of technical capacity, lack of financial resources, lack of data, lack of culture of pro-active programming and over-bureaucratic implementation process, among others. The rule in planning, he said, is to prepare for the worst case scenario but the worst case is a moving target.

Mr Deocariza also presented the climate change adaptation strategies in land use plans. He said that people want options. They do not want to be dictated especially at the local government level. By giving options resistance may be reduced and the decision making will be more acceptable for example in relocation of houses near coasts and river easements from flood lines.

Finally, Mr. Deocariza showed an example of plan of Tabaco City, Albay in the Philippines. He said that the local government is being pro-active that they want to integrate all the principles presented into their land use plan. He added that parks and open spaces is the new trend in urban planning model. It is a proposed 15-year land use plan from 2013 – 2027. Ideas for integrating climate change adaptation in planning need not be reinvented, you can copy it and adapt to your environment.

## Q&A

**Purnomo Dwi Sasongko:**

***How can we get the climate data? Climate information?***

**Marino Deocariza:**

It is good if you have climate information forecast in your city or country. If you do not have that is a big problem. I think the agency responsible for the data is the weather bureau of your country if you do not have experts. In the Philippines, our climate bureau is responsible for forecasting climate changes but they do not do that at the city level that is why it is difficult to disaggregate.

**Julie Ann Amoroso:**

The meteorology department in the Philippines has come up with a climate change projection for 2020 until 2050. Right now we have it at the regional level. We are running a new model now and hopefully by next year we will have it at the municipal level.

**Marino Deocariza:**

I've seen that projection. We are also projecting if the year will be an El Niño year, a drought year, or a La Niña year which is heavy rainfall. That is an important information but for the purpose of city planning, we need to disaggregate it to the city level because one city will not have the same projection as the other city.

**Purnomo Dwi Sasongko:**

*How much carbon is sequestered from building city parks?*

**Marino Deocariza:**

It is very difficult to answer how much but I am sure there will be some benefits other than carbon sequestration. It is difficult to assess the amount of sequestered carbon in parks but the good thing is this is the trend now. What many urban planners are proposing around the world is to have settlements around parks not parks around houses because of the benefits it provides to the residents and for climate change adaptation.

**Dr. Heng Chan Thoeun:**

In the case of Cambodia, we are going for our strategy plan but it is difficult for us to go into adaptation planning. Also along with the negotiation process, it is not approved for the national plan. What is the basis or approach in adaptation planning with a limited capacity?

**Marino Deocariza:**

I think the best approach if you do not have adaptation planning is to mainstream it into existing plans. You do not have to create a separate adaptation plan. At what scale is your strategy plan?

**Dr. Heng Chan Thoeun:**

National level. We are looking in the main sector like agriculture, water resource, industrial, transport, economic development and so on.

**Marino Deocariza:**

If you are doing this plan so often, you can mainstream climate change adaptation into the elements of the strategy plan. I think the concern you are raising is sub-national plans. That is very important. Local plans are the battleground, which is where the impacts are really felt. That is where it is really needed. At the national level you have the expertise and the resources but at the local level you have the impacts. Impacts are directly felt at the local level. So you need plans at the local scale.

**Dr. Heng Chan Thoeun:**

It is easier to say but how to prepare adaptation plan is not easy.

**Marino Deocariza:**

Easier said than done. I think you need some planning assistance, maybe you can ask ICLEI to help you or APAN because they are the regional network to assist countries and cities in climate change adaptation. You need expertise, you need planners, and they are here to help us.

## PHILIPPINES: MAINSTREAMING CLIMATE CHANGE ADAPTATION INTO NATIONAL PLANNING PROCESS

**MS. JULIE ANN AMOROSO**  
**PLANNING OFFICER**  
**CLIMATE CHANGE COMMISSION**  
**PHILIPPINES**

The first to be discussed was the Philippine Climate Change Adaptation Policy Initiatives which lay down the framework for mainstreaming CCA into national development planning processes. This initiative started as early as 1991 of which the Philippine Government has responded to the call of the international community to collectively combat the impacts posed by the changing climate. It comprises of different agencies to cut across different sectors not only from the environment. In 2009, the first legislative enactment entitled “The Climate Change Act” was passed into law. This prompted the creation of the Climate Change Commission as the lead policy making body tasked to coordinate, synchronize, monitor and evaluate all climate change programs of the government. In 2010, the Philippine strategy on CCA was formulated and in 2011, the President, signed the resolution adopting the National Climate Change Action Plan 2011 – 2028 (NCCAP). It is a product of national stakeholder consultations. NCCAP’s ultimate outcome is: “enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change.”



The next part of Ms. Amoroso’s presentation is about the country’s on-going effort to in terms of mainstreaming CCA into national plans. The government has sought partnership and funding with foreign organizations with its CCA programs and projects. Climate proofing of measures is also adapted to the agenda for local and national government. Moreover, CCA has been integrated into the Philippine educational system.

However, the government continues to face challenges in the mainstreaming of climate change adaptation and mitigation into national, sectoral and local planning and development activities. Some of these major bottlenecks are: lack



of common understanding among some important stakeholders, insufficient technical capacity in most of the government units (national and local), lack of properly managed knowledge/data, lack or inadequate financing strategies for the implementation of CCA and DRRM of which still hinders the improvement of adaptive capacities of local communities and natural systems against the impact of climate change and disasters.

Despite these, she said, the country will pursue to achieve its expected outcome and targets to which are: to conduct nationwide ecosystem vulnerability and risk assessment at the national and local levels, derive and implement mitigation and adaptation strategies for key ecosystems, design innovative financing mechanisms and a bundle of CC adaptation assistance for eco-towns communities, conduct provincial level vulnerability and risk assessments, develop and implement knowledge management on CC and disaster risks, mainstream and implement CCA-DRRM in the national and local plans based on information from the vulnerability, and risk assessment and Extensive IEC program on climate change risks management.

## Q&A

**Colleene Lacsamana:**

***Probably you have heard that Baguio City is one of the pioneering cities in the Philippines today that is into climate change adaptation and mitigation. We started the initiative of climate change even before the climate change act was actually approved. Since then, we started certain activities relative to climate change which scales down from the national level. We have anchored and harmonized our local initiatives with those at the national level. Which agency scales down to our level for capacity development and harmonization?***

**Julie Ann Amoroso:**

It is the Department of Interior and Local Government who is tasks to handle capacity building and downscaling these programs down to the local level. Also, the key government sectors are also doing their part in downscaling their programs. For example, the Department of Environment and Natural Resources (DENR), they are asking their regional offices to coordinate with the local government unit but in terms of activities and programs the LGUs can tap the Climate Change Commission for that.

## **BAGUIO CITY, PHILIPPINES: TOWARDS A RESILIENT CITY**

**MS. CORDELIA C. LACSAMANA**

**CITY ENVIRONMENT AND PARKS MANAGEMENT OFFICER  
BAGUIO CITY, PHILIPPINES**

Ms. Lacsamana started her presentation with the profile of Baguio City. It is the summer capital of the Philippines located 1500 above sea level. It is a highly urbanized city with 2.5% growth rate per year. It is also within the rainiest zone in the country with an average of 4,096mm of rain a year. The City Government

of Baguio, mandated to sustain its city as an eco-cultural tourist destination and nature city, commits to sustainable growth and preservation of natural resources, prevention of air, land and water pollution and compliance with relevant environmental regulations and requirements.

On localizing national laws, the first step for harmonization and mainstreaming process is to make laws appropriate and operable to the local situation. The city government takes the lead in all initiatives in mainstreaming climate change and then involving communities, strengthen partnerships with the NGOs and the private sector and the academe and adjoining LGUs. Teamwork, Ms Lacsamana added, is the city's battlecry. The government cannot do everything that is why there is a need to build an alliance with other organizations. People in the communities are the beneficiaries of what the local government is doing. They should be capacitated and involved from the planning up to the implementation. The city government of Baguio initially focused on four major areas of concern tenable within the available local resources and capacity. The localized laws were the Water Code of 2004 from the Clean Water Act; City Eco-Solid Waste Management Plan (2007-2016) from the Solid Waste Management Act; Clean Air Ordinance of 2009 from the Clean Air Act; and the City Reforestation Program and City Disaster Risk Reduction and Management from the National Greening Program and Disaster Risk Reduction. During dialogues and other activities, the communities will not be contented with the local department doing the job, so they are connected with experts from the national government agencies and officials.

To end, the next steps of city initiatives were discussed. To further strengthen the LGU-Academe partnership in research, the need for academe and private sector led environmental campaigns, the need for environmental champions, to make environmental sustainability and integrity a core thrust in governance, strengthen LGU capacity on climate change both at executive and legislative levels and to encourage trans-boundary dialogues.

## Q&A

**Purnomo Dwi Sasongko:**

***It is not easy for private sectors to be involved with our city (Semarang City, Indonesia). Could you tell me more about the private sector involvement in your climate change adaptation and their roles. Is it on planning, budgeting or implementation?***

**Colleene Lacsamana:**

We are capitalizing on the corporate social responsibility when reaching our private sector partner. We made a memorandum of agreement and made them commit. They contribute from the planning and to what they want to do with their resources. I do not know the magic but maybe because they see the commitment of the city towards environmental sustainability that they are partnering with us. Probably it is on a case-to-case basis and I believe many times it is on the leadership of the local government. How he engages them. In the Philippines, we have the City Development Council, which is sounding board for development

initiatives that can call on all sectors to participate in our development initiatives. For the City of Baguio I believe that it has been working.

**Tang Sie Ting:**

Because of the dumpsite problem, you implement new policies. How successful are these policies and what do the government agencies do to help? Do they give incentives? Do you have solutions that could tackle solid waste problems like MRFs and sanitary landfills? Do you ever consider incineration of wastes since you also like to implement renewable energy to Baguio City?

**Colleene Lacsamana:**

We have solid waste management plan that is supposed to be running until 2016. Our city, unfortunately, while we would have wanted to establish a sanitary landfill, none in our community would want to accept its establishment within their vicinity. The idea of “not in my backyard”. We could not get consent. We are hauling up garbage to a nearby province which is about 450kms away from our city and it is costing us a lot. It is about Php800/ton and also Php800/ton for hauling. We have 172 tons of garbage per day. We have to resolve our garbage problem. The city is now in negotiation for waste-to-energy technologies but we are constraint to all this kind of technologies because our national government agency will need to accredit all these technologies before they give it a go. It is difficult really but somehow we are getting headway to making people into segregating. Educating people is difficult. We give incentives but it is at the community level. It is the community that who collects “garbage fees” and there is a sharing scheme. The more you collect fees the more the service becomes efficient. The bigger you collect the bigger your share from the city government.

**Mariliza Ticsay:**

***You said something that the more they collect the more money they get, is not that enough temptation to create more garbage so that the government can collect more?***

**Colleene Lacsamana:**

No, for our case in Baguio it is not working that way. The collection has already been devolved to our communities. So that automatically there is a certain level of sharing at the community level that is adept for the solid waste management. With the rapid population increase in the city of Baguio, we hope to collect more because not all households are paying. The urban solid waste management system costs Php125million per year for manpower resources and everything but the collection is only about Php15million. It is a very subsidized primary urban service. The share is going to be for their clean and green and solid waste management activities.

## GROUP EXERCISE: IDENTIFICATION OF ENTRY POINTS FOR MAINSTREAMING

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The participants were divided into 3 groups:

Group 1 - Philippines, Thailand, Indonesia;

Group 2 - Malaysia, Singapore, Brunei Darussalam; and,

Group 3 - Cambodia, Lao PDR, Vietnam.

Each group should have one main computer/laptop and identify who will be the rapporteur for the plenary and documenter in the group.

The grouping was based on the assumption that the countries priority and concerns are similar because of its geography. It is also an opportunity to share their experience regarding mainstreaming and plans for each country.



For the group work, each country has to identify mainstreaming entry points that they used and are planning to use. After which, they need to identify the specific activities used/planned in each entry point. Next, is to identify the status for those who have practised mainstreaming and lastly, the challenges encountered/foreseen in doing the activities related to mainstreaming CCA.

### DAY 2, 21 SEPTEMBER 2012

The second day of the training started with a plenary presentation of the outputs of the Group Exercise conducted the previous day.

## GROUP EXERCISE: PRESENTATION: GROUP 3 - CAMBODIA, LAO PDR, VIETNAM

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**Presenter: Dao Bach Van, Vietnam**

### 1. Cambodia:

#### **Mainstreaming Entry Points**

- » NSDP update 2009-2013: On going
  - o Prepare each priority strategy and plan
  - o Design and develop Sectoral policy and strategy such agriculture, water resource
- » NAPA 2006: (a) Agriculture and water (NAPA follow up) and (b) Coastal zone adaptation
  - o Link CC adaptation into sub- national level
  - o Focus on community based adaptation (CBA)

- » Cambodia Climate Change Alliance (CCCA): On going
  - o Trainings at national and sub-national level
  - o Conduct CCSP by each priority sectors such agriculture, water resource, coastal zone, health, industry, mine, energy, etc.
- » Vulnerability and Adaptation Assessment under SNC: draft
  - o Build capacity and learn to exchange from regional countries
  - o Conduct Climate modelling and mapping

#### **Planned Activities**

- » Develop CCSP
- » NAPA: 39 projects and 20 priorities projects
- » CCCA:
  - o Dissemination and knowledge management
  - o Mainstreaming CC into NSDP update 2014-2018
- » SNC:
  - o Assessment the climate change impact on priority sector
  - o Propose adaptation option for short and long term

## **2. Lao PDR**

#### **Mainstreaming Entry Points**

- » NAPA 2009: NAPA follow up such as agriculture and water
  - o Data collection
  - o Propose project priority for implementing adaptation at local level

#### **Planned Activities**

- » Vulnerability and adaptation assessment
- » Capacity building and awareness raising
- » Create adaptation manual

## **3. Vietnam**

#### **Mainstreaming Entry Points**

- » SNC: submitted to UNFCCC 2010
  - o Summary the Climate change impacts and adaptation measures
- » Establish NTPRCC, SPRCC:
  - o NTPRCC: Decision 1138/QĐ-TTg to approve 22 CC projects in 2012-2015, in which 13 projects to build up Adaptation Action Plan to CC
  - o SPRCC:
    - » To support the development and implementation of climate change related policies and strategies based on the “National Target Program to Respond to Climate Change (NTP-RCC)”
    - » To serve as a platform for (1) aid harmonization, (2) policy dialogue, and (3) project formulation.
- o 2012: Establish National Steering Committee for Climate Change
  - » New laws on water resources management 2012
  - » Adaptation framework by MARD 2008-2020

#### **Planned Activities**

- » Continue the work of NTPRCC and SPRCC

- » Continue the work on the adaptation framework by MARD and other related ministries by 2020
- » Integrate NCCC into sectors and levels: Adaptation plan in 2 pilots provinces (Quang Nam and Ben Tre) : On going
  - o Eco-economy in Quang Nam: Construction, reforestation in coastal areas
  - o Building adaptation framework based on the ecosystem in Ben Tre province
- » On going projects: CBA in urban areas (Da Nang, Can Tho and Quy Nhon provinces)

#### 4. Challenges

- » Limited budget
- » Toward a sustainable development: society vs. economy vs. environment
- » Capacity building:
  - o Public awareness through media, document, manuals, training and education
  - o Technological transfer
  - o Enhance the cooperation nationwide and international
- » Data archive and sharing information:
  - o Consistence
  - o Permanent
  - o Available

#### Q&A

##### **BK Singha:**

This is a little bit off but still related. In the government perspective, with the current efforts of climate change adaptation or otherwise, government policy and implementation, is there an impact on the economy or foreign direct investment in relation to the efforts being done on climate change? Is there a direct relation or impact within the two?

##### **Mariliza Ticsay:**

The question is, in your knowledge as a government entity or a citizen of your country, with the efforts that your country is doing on climate change adaptation, are there any indications that foreign investors see value in your efforts such that there are more investments coming in? Is the outside world, in terms of investment appreciate what you are doing in climate change adaptation such that they do not find any threat that if they invest in your country they would not get flooded?

##### **Mozaharul Alam:**

It is the same question in a different way whether there is a lack of interest as countries not addressing climate vulnerability. If there is a positive interest from the investors as the country is putting the legislation and policy to protect the area from any disaster? You can also ask that as the countries becoming more vulnerable, is there a negative interest from the investors not to invest? It is a very challenging question.

**BK Singha:**

I know it is a very challenging question, I am just trying to feel the temperature and to gauge as to if there is any special attention from investors on what the country is doing such as in terms of adaption efforts this one is better. Of course he will also recognize other things like tax, infrastructure and all typical businessmen do, but in terms of gauging is this one of the market they want to invest?

**Heng Chan Thoeun:**

In Cambodia, a bank invested in the country with priority on agriculture, water resource, 86 million for 3 years investment. Also, they are looking for a country with technology assessment.

**Colleene Lacsamana:**

I would just like to share Baguio City's experience relative to assessing technology. We adopted a green technology relative to solid waste management. We still have to follow the national policies relative to procurement but the recommendation and evaluation of local government unit relative to the appropriateness of the technology to our situation was considered. Specifically, I was talking about the rapid composting facility that was supposed to produce fertilizers out of biodegradable wastes. The board of investments together with the evaluation and recommendation of the national agencies regarding the solid waste management like the DENR, National Solid Waste Commission, Department of Trade and Industry (DTI) and other agencies contributed and help us evaluate the appropriateness and saw to it that we are able to make it work. The decision of the local government prevails and how they justified it where investments can come in.

## GROUP EXERCISE: PRESENTATION: GROUP 1 - INDONESIA, PHILIPPINES, THAILAND

Country	Mainstreaming Entry Point/s <sup>1</sup>		Activities	Status	Challenges
	Implemented	Planned			
Philippines	N: Budget Program Approach		1. Consultation with various key government agencies identified in the issuance  2. Validation/vetting with the CCC Secretary and DBM  3. Consolidation and Submission of the Strategies	Adopted in NEP 2013   On going	Difficulty in getting information  Absence of a criteria/ screening tools  Funding Resources Lack of technical capacity at the local level
	L: Science-based LCCAM Plan		1. Doing the situational analysis  2. Consultation with various agencies to scale down CCAM to the community level		
	N: Philippine Development Plan		3. Formulation of the framework for CBCCAM and DRRM  1. National Multi-Stakeholder Consultation  2. Revision of the draft plan  3. Vetting with key govt agencies	PDP approved and signed by the President  Uploaded in the website of NEDA	Difficulty to really identify CC impacts among different sectors  Lack of technical expertise on the field of CC

<sup>1</sup> Note: N – National; L - Local



Country	Mainstreaming Entry Point/s <sup>1</sup>		Activities	Status	Challenges
	Implemented	Planned			
		N: School Curriculum	<ol style="list-style-type: none"> <li>1. Exploratory Meeting with department head and other concerned officials</li> <li>2. MOA Signing</li> <li>3. Preparation of modules and other materials</li> <li>4. Pilot Test in chosen provinces</li> </ol>		
<b>Indonesia</b>	L: Urban Planning (City Gov't of Semarang)		<ol style="list-style-type: none"> <li>1. Conducted VA in some areas</li> <li>2. Result of VA was integrated in the urban planning process</li> <li>3. Consultation with people residing in the vulnerable areas</li> </ol>	<p>Plan was approved June 2011</p> <p>Pilot tested in one river system (out of 19)</p>	<p>Need for Extensive consultation to convince the people</p> <p>Funding Resources to implement the plan</p>
<b>Thailand</b>	N: Thailand Climate Change Master Plan 2012-2050	<p>Adaptation for coping with the negative effects of climate change</p> <p>Mitigation of greenhouse gas emissions and increase of greenhouse gas sinks</p> <p>Capacity building of human resources, organizations and the nation to manage the risks from the effects of climate change</p>	<ol style="list-style-type: none"> <li>1. Conducted study on vulnerable areas to identify the hot spot in terms of impacts of CC i.e agriculture, water resources, coastal and health</li> <li>2. Preparing national strategies on climate change 2013-2017</li> </ol>	<p>Final version to be submitted to the Committee on Climate Change</p>	<p>Overlapping of functions</p> <p>Turfing issues</p>

Country	Mainstreaming Entry Point/s <sup>1</sup>		Activities	Status	Challenges
	Implemented	Planned			
	N: Master Plan on Sustainable Water Resource Management	Work Plans for: <ul style="list-style-type: none"> <li>• Restoration and Conservation of Forest and Ecosystem</li> <li>• Management of Major Water Reservoirs and Formulation of the National Annual Water Management Plan</li> <li>• Restoration and Efficiency Improvement of Current and Planned Physical Structures</li> <li>• Information Warehouse as well as Forecasting and Disaster Warning System</li> <li>• Preparedness to Emergency Situation in Specific Areas</li> <li>• Assigning Water Retention Areas and Recovery Measures</li> <li>• Improving Water Management Institutions</li> <li>• Creating Understanding, Acceptance, and Participation in Large Scale Flood Management from all Stakeholders</li> </ul>	Application policies into practices by government agencies at all level; national, provincial, and community level	On going	Overlapping of functions  Budget management  Transparency  Application policy into practice at community level

Country	Mainstreaming Entry Point/s <sup>1</sup>		Activities	Status	Challenges
	Implement-ed	Planned			
	N: Strategies plan on climate change for agricultural sector 2012-2016	Create adaptive capacity which response to the impact of climate change  Reduction in the emission of greenhouse gas in agricultural sector  Driven of climate change strategies	Application policies into practices by agencies of the Ministry of Agriculture and Cooperatives	Approved by Ministry Board	Overlapping of functions

## Q&A

**Mariliza Ticsay:**

*I have a question. Yesterday, in your country do you already have one entity, one body that takes care of climate change as a whole?*

In the Philippines, we have the Climate Change Commission and it takes care both adaptation and mitigation. Yesterday, I was asking people from Vietnam and Cambodia, who is your focal person in REDD+ which is under mitigation? And the answer is, “oh, that belongs to the Department of Agriculture”. So it looks like adaptation is being separated from adaptation and two different agencies are working on it separately and differently when in fact it is both climate change concern. That could also be difficulty or another challenge if workers or even funding agencies are going to offer funds for any work in any country. There becomes a scramble on whoever gets what first because this is more important than the other one.

Again, we also have to think about these things and we are talking about our own country situations. Is there one unit that could take care of everything that everybody agrees to? Otherwise, they will all be fighting for a piece of the pie. That could be a problem. Before, it was all mitigation because the money was all in the mitigation but then there is a realization that adaptation could really be the answer because all the impacts of climate change was there. Even with APAN, for example, we are talking about adaptation. Maybe sometime we might be thinking that mitigation measures could be part of adaptation itself.

**BK Singha:**

Can I just share my experience? For organizations like ICLEI and APAN, this is extremely important because for Malaysian perspective, this turfing causes a lot of slippage and breakage for us. I think that if organizations like APAN

and ICLEI can recognize this problem and try to consolidate it and address it at least, it could help us.

#### **Puja Sawhney:**

You are right. At first, everyone was looking at mitigation and then adaptation happened. APAN is functioning in more than 50 countries in the Asia-Pacific region which include countries like Japan and Korea. Although adaptation is our main focus because we are focusing on developing countries, we are still looking into mitigation. In India, there is only one ministry that looks on adaptation and mitigation. I was surprised to know that there are countries which has separate departments leading on adaptation and mitigation but that is how the government must have had something in mind. For me, I can see the difficulty in dealing with climate change as an issue and break it down to mitigation and adaptation because we should address this to a holistic manner.

#### **Mozaharul Alam:**

My question is actually the opposite. As you have identified the challenges, could you give us how to address the challenges so that we can break the challenges itself. Through that, we can identify what type of support to provide the government or any other champion at the country level. If we target them, some of the challenges will be addressed.

## **GROUP EXERCISE: PRESENTATION: GROUP 2- MALAYSIA, SINGAPORE, BRUNEI DARUSSALAM**

**Presenter - Mohd Syazwan Faizal B. Mohd.**

Country	Mainstreaming Entry Point/s		Activities	Status	Challenges
	Implemented	Planned			
<b>Malaysia</b>	Green City Putrajaya	National	Waste segregation at sources	Transition	Campaigns and awareness
	The National Policy on Climate Change		Establish the Green Technology and Climate Change Council.  On-going research/ training and workshop and monitoring the response on the climate change policy.	On-going	Capacity building
	The National Security Council of the Prime Minister's Department - Hyogo Framework Action (2005-2015)		Coordinating activities that are implemented by the Disaster Management and Relief Committee at federal, state and local levels that comprises various agencies.	On-going	Limited implementation to convince decision makers.  Awareness of the relevance significance of scientific information, particularly among policy and decision makers is very low.

Country	Mainstreaming Entry Point/s		Activities	Status	Challenges
	Implemented	Planned			
	National Hydraulic Research Institute of Malaysia (NAHRIM) Research Centres.	National	<p>Hub's Impact Assessment &amp; Adaptation Projects Team through:</p> <ol style="list-style-type: none"> <li>1. Developing a guideline on climate change vulnerability adaptation and strategies with special focus on flood and drought</li> <li>2. A regional hydrologic-atmospheric model of Peninsular Malaysia called as 'Regional Hydro-climate Model of Peninsular Malaysia (RegHCM-PM) was developed (9km resolution)</li> <li>3. A regional hydrologic-atmospheric model of Peninsular Malaysia called as 'Regional Hydro-climate Model of Sabah &amp; Sarawak (RegHCM-SS) was developed (9km resolution)</li> <li>4. A regional hydrologic-atmospheric model of Peninsular Malaysia called as 'Regional Hydro-climate Model of Peninsular Malaysia (RegHCM-PM) Phase-2 in development (6km)</li> <li>5. Regional Climate Modelling Using PRECIS Climate Model (Phase 1 – 25km)</li> <li>6. Regional Climate Modelling Using PRECIS Climate Model (Phase 2 – 5km)</li> <li>7. Regional Climate Modelling Using Regional Climate Model Version 4 (RegCM4) (1 – 5km)</li> </ol>	<p>Finished</p> <p>Just started</p> <p>Finished</p> <p>Finished</p> <p>Planning Stage</p>	

Country	Mainstreaming Entry Point/s		Activities	Status	Challenges
	Implemented	Planned			
		Curriculum Adaptation in Malaysian Universities	Survey and preliminary study on assessment of the incorporation of climate change education in the curricula of planning schools in Malaysia.	On-going	Lack of qualified academic staff on teaching.  Planning schools are still focusing on the physical design or policy formulation aspect of planning.
	National	National Water Resources Policy		Finished	How far the strategic action plan that contain in the policy can be implement.
<b>Brunei</b>	Coastal line protection		Wave breaker	Successful	
	Guidelines for buildin developers		Drainage reserve	Successful	
		Guide-lines for building develop-ers	Rain harvesting	Pilot proj-ect	
<b>Singapore</b>	Water Re-sources		<ul style="list-style-type: none"> <li>Water catchment coverage has been increased to 2/3 of Singapore's land area.</li> <li>Target to increase Desalination and NeWater to meet 2/3 of Singapore's water demand by 2020 and 80% by 2060 (not dependent on rainfall)</li> </ul>	Successful	

Country	Mainstreaming Entry Point/s		Activities	Status	Challenges
	Implemented	Planned			
	Drainage Masterplan		<ul style="list-style-type: none"> <li>Development of drainage infrastructure in Singapore for the past 30 years has reduced flood prone areas from about 3,299ha in the 1970s to about 49ha as in January 2012.</li> <li>On-going drainage improvement works will progressively reduce the flood prone areas over time.</li> </ul>	Successful	
			<ul style="list-style-type: none"> <li>Coastal Adaptation Study to be carried out to come up with a coastal protection framework on a national scale</li> </ul>	Research	<p>Every inch of land in Singapore is valuable given our limited land area. Hence, retreat as a coastal adaptation strategy is not viable.</p> <p>Having to manage public communications tactfully to avoid causing undue alarm.</p>

## Q&A

**Heng Chan Thoeun:**

*In climate modelling, how did you choose which one you would use?*

**Mohd Syazwan Faizal B. Mohd.:**

Actually we choose the model based on the expertise we have in our country. Like PRECIS, we have several persons who can run and have license. For RegHCM- PM, we have one person who have attended its training in Italy. We plan to run the RegHCM-PM model maybe this year or next year.

**Mohan Kumar Summathuria:**

Basically, climate modelling in Malaysia started around 2006. Later, PRECIS was integrated into the other models to have an extended climate projection approach. No single model is accurate. No one is actually able to completely model the atmosphere. It is not a perfect science. The more models you have

## ROLE OF SCIENCE AND INFORMATION TECHNOLOGY IN CLIMATE CHANGE ADAPTATION

**MOHAN KUMAR SAMMATHURIA**  
**METEOROLOGICAL OFFICER**  
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**MALYSIAN METEOROLOGICAL DEPARTMENT**



Mr. Mohan Kumar Sammathuria started by introducing the science behind the causes of climate change. The effects of which is the increase in sea level, increase in temperature, more frequent storms and typhoons and extreme weather event. He said that impacts of these events especially affect the food supply and the health of people. He added that vulnerable locations particularly for storm surges cannot be helped and that population growth further amplifies the impacts of these events. The same weather event from a hundred years ago, now with more loss of life not because of anything but because of population increase.

Resistant crops, better irrigation techniques, early warning systems, efficient policy coordination, financing schemes are just examples of what should be done in this changing climate. In addition, people should adapt through better forecasting, building codes and through regional planning. With

today's level of technology, having multiple models or scenarios can predict the possibilities of a certain event. In addition, it is also important to be informed in making decisions by using solid climate data.

The cost of adaptation is a lot at the present day but its future benefits could be unquantifiable. Climate change adaptation and disaster management somewhat goes hand-in-hand although the former addresses the future and the latter addresses the present.

Lastly, Mr. Sammathuria stated that climate change adaptation and disaster risk reduction are very much dependent on policies or policy direction taken by a particular country. If the policies do not favour adapting to possible climate change impacts then there could be a problem managing disasters. However, if policies go thru climate change adaptation then disaster risk reduction will be more effective.

### Q&A

#### **Heng Chan Thoeun:**

We know that greenhouse gas is emitted but we don't know how high in the atmosphere the greenhouse gases go? How much is the effect of concentration of CO<sub>2</sub> in temperature? And why El Niño has an effect in rainfall?

#### **Mohan Kumar Sammathuria:**

It is below the troposphere. My guess would be at 45,000ft at maximum. It



will not go higher than that because it becomes colder as it gets higher in the atmosphere.

During one conference, if I am not mistaken, it was mentioned that if you want to maintain projections of global temperature increase not to exceed 2 degrees Celsius, then, the global parts per million of CO<sub>2</sub> must not exceed 300 or 400. Once it goes more than that, it will be possible that the global surface temperature towards the end of the century will be more than 2 degrees Celsius.

And for the last question regarding El Niño. For El Niño you have shift in the low pressure region towards the Central Pacific. When there is a shift in the low pressure region towards the east, the El Niño becomes higher. The winds, called easterly winds, flowing from the eastern pacific towards the western pacific decrease its strength. When it decreases its strength, it brings less rainfall. Not every El Niño is followed by a heavy La Niña season. Certain La Niña is heavy but most are not.

For example in the Philippines, certain areas are more severely impacted by the El Niño compared to the other areas. The reason is that in the area from central to northern Philippines, El Niño has generally no impact because of the typhoons compared to the southern part. Similar to Malaysia, during an El Niño season, the impact on eastern Malaysia is more severe. Thereby, for the western part of Malaysia to actually experience a severe impact of drying, it would need an El Niño of high strength. Only a strong El Niño would have an effect on the western part of Malaysia but in eastern Malaysia, even a weak El Niño with a certain degree influence will have an effect.

## CAMBODIA TECHNOLOGY ASSESSMENT: ADAPTATION TECHNOLOGY FOCUSING ON AGRICULTURE AND WATER SECTOR

**DR. HENG CHAN THOEUN**  
**DEPUTY DIRECTOR OF CLIMATE CHANGE DEPARTMENT**  
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**CAMBODIA**



Cambodia's priority is to achieve the country's Millennium Development Goal (MDG) by 2015. Thru their vulnerability and adaptation assessment, the agriculture and water resource sectors were included as a priority sector in their National Adaptation Program of Action to climate change (NAPA, 2006).

The country, according to Dr. Heng, uses its existing climate change institutional structure to implement TNA project. They have conducted consultations, prioritizations and consensus among Cambodia's stakeholders in coming up with lists of proposed adaptation technology/options. The Adaptation TNA draws from the strategic choices of

Cambodia's NAPA, and aims to assess in greater detail specific climate change adaptation technologies.

Agriculture/forestry, water resources, human health, and the coastal zone are the sectors most vulnerable to the impacts of climate change in Cambodia. The consensus among Cambodia stakeholders is to focus on the two sectors of water resources and the coastal zone adaptation part.

After consolidation of technologies and prioritization, the following were chosen as the most important:

- rainwater harvesting from rooftops and wells for domestic water supply and for the community;
- Small reservoirs, small dams and micro-catchments. (2) for the coastal zones it is mangrove management.

A national consultation was conducted with purpose of identifying barriers.

For the next part, Dr. Heng discussed the challenges for the development of the adaptation technologies which are: (1) technologies' lack of specific data/information, (2) capacity is limited and need to improve capacity on CC adaptation technology for all identified technologies, (3) estimation of adaptation cost and benefits, (4) involvement of all relevant stakeholders, (5) policies and strategies to remove barriers and (6) procedures to access international bilateral and multilateral financing.

Finally, he talked about the lessons learned for the process which are:

- the existing national climate change institution play a key role in TNA preparation,
- National Communication documents are good reference fo TNA development,
- Multi-Criteria Decision Analysis (MCDA) model is a good tool for prioritizing technology,
- familiar model and technology information with participants and local experts is very important step to explore ultimate inputs from all key stakeholders,
- Specific data/information is necessary,
- TNA need to be regularly updated and identified technologies, and
- exchange and share experiences among regional TNA adaptation technology countries.

# CLIMATE CHANGE ADAPTATION TECHNOLOGY FOR AGRICULTUREAL SECTOR IN THAILAND

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Impacts of climate change and its affects in the agriculture sector were identified to be increasing temperature and drought, and heavy rainfall and flood. This translates to damages in production and economic losses. Other impacts mentioned were sea- level rise, coastal erosion and loss of biodiversity.

Under the strategies framework of Thailand's Climate Change Master Plan 2012 – 2015, there are 3 strategies plan on climate change for agricultural sector (2012-2016):

1. Create adaptive capacity which response to the impact of climate change,
2. Reduction in the emission of greenhouse gas in agricultural sector, and,
3. Driven of climate change strategies.

This is practiced to all levels of the government, however, the problem arises due to overlapping functions of the agencies.

Ms. Kasem mentioned that at the local level, climate change adaptation planning should base on rather unique or specific context of the community or landscape and that community-based adaptation strategies can help rural communities strengthen their capacity to cope with disasters and improve their adaptive capacity.

Technologies for adaptation is categorized as (1) “hardware” or hard technologies which are examples of capital goods and equipment , (2) “software” or soft technologies refers to methods and practices that may not normally be regarded as technologies, but also the capacity and processes involved in the use of the technology and spans knowledge and skills, aspects of awareness-raising, education and training including insurance schemes or crop rotation patterns, and (3) “orgware” which relates to the ownership and institutional arrangements of the community or organization where the technology will be used.

Finally, she presented an adaptation technology for coastal erosion in one of the provinces of the country. It is by constructing bamboo revetments to prevent heavy rains and storm. This then become the area for gathering sediment and as the sediment increased, firewood tree (*Myrsinaceae*) is grown. This new initiative happened after the previous schemes were destroyed and made waste. Ms. Kasem ended her presentation with one of the lessons learnt that climate change adaptation for community development should be developed through learning by doing.

## PRIORITIZING CLIMATE CHANGE ADAPTATION MEASURES

**MR. GURMIT SINGH K. S. CHAIRMAN**  
**CENTRE FOR ENVIRONMENT TECHNOLOGY AND DEVELOPMENT,**  
**MALAYSIA (CETDEM)**

Mr. Gurmit Singh, at the start of the presentation, emphasizes that global warming affects us all. No human or ecosystem is immune to this and nobody is innocent in not contributing to the global warming, we do in different degrees. He added that adaptation is inevitable whether we are able to control the temperature, man has always have to adapt. Adaptation, he said, is a latecomer since the whole focus was on mitigation. But we have to do both, it should not be separated.

The adaptation process is a cycle. It should keep on improving. It should not be ad hoc as vulnerabilities should be identified and react to them. The process of evaluation should include relevant stakeholder participation, access to relevant information, the range of adaptation measures needs to be identified as well as their scale, and the objectives must be clear as to minimize or avoidance of all impacts or stay within the agreed budget or levels. Moreover, planning can be on the national, local or sectoral level and that planners have to ensure that infrastructures and buildings can adapt to climate change vulnerabilities.

Next, Mr. Singh talks about the criteria in assessing adaptation measures, the tools needed in analysing adaptation measures and identifying priorities. Not all measures can satisfy all the assessment criteria and a combination of tools may be needed as each have their own strengths and weaknesses in a particular area but the measures selected should have implications for strategic issues. Altogether, these are what planners needed and with the multi-stakeholders participation priorities can then be established.

Finally, he discussed the climate change impacts on the transport sector in Malaysia. He cited that the transport sector needs to develop systematic adaptation strategy. Many local roads are vulnerable to flooding partly because of poorly maintained or outdated drainage system. As one of the biggest sector, it should also be climate resilient by coordination between government agencies and private sector, include climate vulnerability in planning and all stakeholders should be mobilised.

In conclusion, he stressed that assessments required should be broad. There is a need to identify assumptions and uncertainties. Although most of the uncertainties are manageable, we can learn from experiences of other countries especially that more information can be shared today because of the internet. We also need to broaden partnership among ASEAN countries and have a strong position on climate change. Multi-sectoral participation and inclusion of climate change in planning. Implementation can occur in many different manners.

## Q&A

**Audrey Huang:**

*Which assessment would you recommend on a national level? In Singapore, we are looking at 6 sectors: coastal protection, biodiversity, public health, urban infrastructure and energy demand as well as water resources. In each sector we are trying to assess and prioritise adaptation. Which of the assessment would be most appropriate?*

**Gurmit Singh:**

Risk assessment is too generic. You may have to consider Cost Effectiveness Analysis (CEA). Cost Benefit Analysis (CBA) is too straightforward.

**Audrey Huang:**

What if we do not have a concrete adaptation option yet? We are just trying to see the areas.

**Gurmit Singh:**

For the policy makers, risk assessment is the easiest. It does not require much data but you need to have more understanding on risk. If you have no idea you have to talk to somebody who knows what the risks are. What are the risks involved.

## GROUP EXERCISE: IDENTIFICATION AND PRIORITISATION

Similar to the previous group exercise, the participants were divided into 3 groups:

Group 1 - Philippines, Thailand, Indonesia;

Group 2 - Malaysia, Singapore, Brunei Darussalam; and, Group 3 - Cambodia, Lao PDR, Vietnam.

Using the worksheet provided, the groups shall:

1. List down the adaptation measures that each country is currently implementing,
2. To identify which climate change impact is addressed by the adaptation measure/s.
3. Identify the challenges and lessons learned in implementing the measures.
4. List down the recommendations for each of the measures.
5. Determine if the measure is a high, medium or low priority of the government.
6. In your own assessment as a group, identify whether the particular measure



Groups Exercise Presentation: Group 1 - Indonesia, Philippines, Thailand

Country	Measures	Climate Change Impact Being Addressed	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						National	
Indonesia	Improvement of Drainage System (Construction of Seawall)	Floods due to tidal inundation and coastal erosion	Easements Land ownership (private and public)  Engineering design more of business as usual without including climate info		Gov't must buy the land from private owners  City gov't must start including climate change information to have informed and better measure	High	High
Philippines	Improvement of Drainage System or Flood Control Program	Floods due to increase in precipitation	-Land acquisition and expropriation  - Identification of appropriate engineering design not business as usual	The National Govt recognized the impacts of CC	-Appropriate funds for expropriation  - Climate Proofing of Flood Control Infrastructure	High	High
	Massive IEC Campaign	All impacts: LS, FF, SS, TS	-Funding New policy directions of the national government		Facilitate activities and advocacy to cope with the requirements of adaptation and mitigation at all levels  -Make resources available to augment local resources	High	High
Thailand	Infrastructure improvement	Floods due to precipitation	- agricultural land use management for flood way during rainy season  - expropriate land for city plan management (private land)	- conflict between landowners and government	-community participation land Communication  - Subsidy from national government for local compensation	high	High

Note: It is difficult to distinguish adaptation strategies between “business as usual” measures because of the absence of vulnerability assessment reports. The general recommendation is to increase technical capacity for the conduct of VA to have a science-based planning/ program

### Groups Exercise Presentation: Group 1 - Cambodia, Lao PDR, Vietnam

Country	Measures	Climate	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						Natio	
Cambodia	<p>Dissemination to local community and early warning system</p> <p>Preparedness to respond to CC hazards (safety place, food, drinking water)</p> <p>Health prevention</p>	Flood	<p>National budget allocation is limited</p> <p>Institutional coordination and capacity responsibility is still limited</p> <p>Information dissemination is limited to access local target</p>	<p>Experiences from local knowledge</p> <p>Institutional cooperation</p> <p>Regional and international cooperation</p>	<p>Should have mass media to vulnerable areas</p> <p>Prepare food, medicine, drinking water etc. for people evacuation</p>	high	high
	<p>Rehabilitating irrigation system</p> <p>Water resource technology: well or pond, small dams and micro-catchment</p>	Drought	<p>Local knowledge is limited</p> <p>Water source is far</p> <p>Lack of water management system</p>	<p>Experiences from local knowledge</p> <p>Institutional cooperation</p> <p>Regional and international cooperation</p>	<p>Should have mass media to vulnerable areas</p> <p>Prepare food, medicine, drinking water etc. for people evacuation</p>	High	High

Country	Measures	Climate	Challenges	Lessons Learned	Recommend	Prioritisation (low, med, high)	
						Natio	
	Rainwater Harvesting from rooftops, small reservoirs  Dissemination and education to local communities  Crop variety				Find job alternative  Integrated farming system		
Lao PDR	Drainage system  Low land  Heavy rain	Flood	Lack of methodology and data  Early warning system	Improve early warning system,  Strengthening capacity building for government official and local level.  Rising public awareness	Dissemination through  mass media to community	high	high
	Water catchment  Irrigation System	Drought	Temperature increasing  Long dry season	Improve water catchment and  Irrigation system	Improve early warning system,  Rising public awareness  Should improve media system for national level and provide information to class rood	high	high



Country	Measures	Climate	Challenges	Lessons Learned	Recommend	Prioritisation (low, med, high)	
						Natio	Grou
						Asses.	Asses.
Vietnam	genetics/Plant breeding Rice to upland grains Biochar	growth rate sea-level rise	Action plan for Agriculture CC Adaptation require large scope, long time and high determination	Agriculture should be invest and contribute step by step	expert organization should consult to Government in policies making support to applying technology.		
	Plant science/ Plant genetics Agro-forestry	Changes in pattern of forest ecosystems Forest fire risk Growth and dispersion of harmful forest pests	Lack of Master Plan Extreme environment condition	Land Management Agro – forestry	R &D technology improvement, land use improvement base on local eco system Support polices for agro – forestry	High	high
	Rooftop rainfall harvesting for household usage Harvesting runoff water Integrated River Basin Management	Change on river flow regimes Groundwater table	Restriction due to quality, quantity, balance and geology	Supply enough information Public raising awareness	Choose carefully the technologies and combining them for better result	Med	Med

Country	Measures	Climate	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						Natio	Group Asses.
	Sea dike  Coastal wetland rehabilitation	SLR  (Flooding, Salinity intrusion)	Lack of awareness;  Poor infrastructure;  Low budget and	The results of measures will be used to put into adaptation action plan	Implement the education and training according to  National Targeted Program to Respond to Climate	High	High

### Groups Exercise Presentation: Group 3 - Brunei, Malaysia, Singapore

Country	Measure	Climate	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						Natio	Group Asses.
Malaysia	Drainage improvement  Flood Monitoring Station	Flooding	Land acquisition	More efficient in design the drainage system	Implementation of Integrated Water Resources Management (IWRM)  A review of current water-management practices	High	Med

Country	Measure	Climate	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						National	Group Assess.
	Integrated Solid waste management	CH <sub>4</sub> emission from landfill	Law enforcement  Awareness on behavior change among public	Important of waste management to conserve the environment	Learning from best practices of solid waste management in other country.  Need of law enforcement	Med	High
	Drought Monitoring Station	Drought	Financial constraints	Ensure the monitoring station in good condition	More allocation of budget to build more station.  Further research in innovative rainwater management is needed to explore new ways of reducing flood, drought and other climate risks in cities, town and communities	Low	Low

Country	Measure	Climate	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						National	Group Assess.
	Preservation of existing forest	Landslide, watershed pollution	Controlled illegal logging  Leaking of low enforcement	Importance of forest as the natural resources  and water catchment	Implementation of Sustainable Forest Management Practice (SFMP)  Establishment of forest plantation  Enrichment and replanting programs	Low	Med
Brunei	Drainage improvement	Flooding	Land acquisition	Most existing drainage systems were designed for low flood recurrence interval	Increase public awareness  Upgrading the system to higher resilient level	Med	High
	Retention ponds	Drought	Land acquisition		Increase public awareness  Build more retention ponds	Med	Med

Country	Measure	Climate	Challenges	Lessons Learned	Recommendations	Prioritisation (low, med, high)	
						National	Group Assess.
Singapore	Drainage improvement	Flooding	Highly urbanized areas and site constraints	There is a limit to conventional drainage solutions	Develop solutions at 'source' eg. green roofs and porous pavements, to better manage storm-water runoff.	High	High
	Protection of coastline	Sea level rise	Maintenance issues	Hard structures will disintegrate after several years due to being subjected to constant wave actions	Research into "soft" coastal protection practices, including the use of plants (such as mangroves and sea grasses)	Med	Med
	Land Use-Planning and Urban Design	Urban Heat Island Effect	Densely built city with limits in a major revamp for urban planning.	Previous planning did not take into account the urban heat island effect	Study to identify how the built environment and urban greenery could affect micro-climatic conditions such as air flow and temperature	Med	Med

## INTRODUCTION TO THE ASIA PACIFIC ADAPTATION NETWORK (APAN)

**DR. PUJA SAWHNEY**  
**COORDINATOR**  
**ASIA PACIFIC ADAPTATION NETWORK (APAN)**

Dr. Puja Sawhney presented the background and some activities that APAN is conducting. She said that after COP 15, it was recognized the need for establishing new network to exchange knowledge on climate adaptation. There is a lot of information available on climate adaptation but not much is happening in terms of exchange of this information and there is a need to communicate this information to the right stakeholders like government officials and other stakeholders. As a response, consultation meetings were organized in 2008 and 2009 around the globe. As a result UNEP has established Global Adaptation Network (GAN) and the APAN is the first network setup under it.

The network is aiming at institutional capacity, knowledge mobilization and demonstration and dissemination of best adaptation practices among others. APAN is funded through the Ministry of Environment in Japan but based on Thailand.

According to Dr. Sawhney, APAN operates five sub-regional nodes: Southeast Asia, South Asia, Northeast Asia, Central Asia and the Pacific; and has identified three thematic nodes - water, agriculture and mountains recognized as the most important sectors in the region. APAN's vision is to build climate resilience of vulnerable human systems, ecosystems and economies through the mobilization of knowledge and technologies to support adaptation capacity building, policy-setting, planning and best practices.

To end the presentation, she introduced the climate change adaptation web portal which is a database on good adaptation practices and technologies from the region.

## APAN TECHNOLOGY DATABASE: ADAPTATION NEEDS AND TECHNOLOGIES IN WATER SECTOR

**MS. MARIKO FUJIMORI**  
**DIRECTOR**  
**PACIFIC CONSULTANTS CO., LTD.**

Ms. Mariko Fujimori talked about her involvement together with scientists and engineers who are familiar with Asian condition related to climate change and its impacts in developing APAN website on information and adaptation technology database. This database will be used as a simplified map for wide range of technologies on climate adaptation. She added that it will promote a smooth formulation and implementation of adaptation policy at the national or local level.



As a first step, needs and technologies for adaptation on coastal zones was published. She stated that this year, the focus is on the adaptation needs in water sector. As a second step, information will be collected on water quality, quantity and circulation, and its difference by types of resources and country. For next year, it will be on agriculture.

In establishing a database, they consider identifying technologies that can be used through the steps of adaptation technology. She also added that they are avoiding having a huge database that is difficult to maintain and operate but making the database more user-friendly and more operationalized or workable.

She applauded the participants for addressing climate change mitigation and adaptation at the same time. Then, she asked for their support in terms of collection of information regarding water.

## Q&A

**BK Singha:**

*This year you want to tackle the area of water, I just would like to find out how do you prioritize the areas? What considerations? From what perspective your analysis came from in the choice of area you want to gather data from?*

**Mariko Fujimori:**

Last year, we used many worldwide information from IPCC, reports published by ADB, IGES, APAN and we found several important sectors. These reflect the characteristics of Southeast Asian countries. It is difficult to decide which sector should be the first one. We considered more urgent issues that cover several sectors as well as the difficulty to collect information since most coastal related information is not available publicly.

## CLOSING PROGRAMME

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### FEEDBACK FROM PARTICIPANTS

**Mohammad Akmal Fikry Yusra**

**Environmental Officer**

**Climate Change Unit Ministry of Development Brunei Darussalam**



Mohammad Yusra thanked ICLEI and APAN for the training and for all colleagues for shared information and activities of their respective countries. Brunei is new to climate change especially adaptation, perhaps the newest in the region, he added. The country is still building its capacity. All the information shared, especially from the presenters who did their presentation very well provided useful information for preparing adaptation activities in their country. Brunei is concerned about climate change and adaptation is becoming a priority now.

**Tran Thi Bich Ngoc**  
**Official**  
**Climate Change Division**  
**Department Of Meteorology, Hydrology and Climate Change**  
**Ministry of Natural Resources and Environment**  
**Vietnam**

Ms. Tran also thanked APAN and ICLEI for the invite. She then said that she have gained a lot of knowledge and experience and was impressed with the working group. She ended her message by saying that she hoping to meet the participants again in the future.

## CLOSING REMARKS

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**DR. PUJA SAWHNEY**  
**COORDINATOR**  
**ASIA PACIFIC ADAPTATION NETWORK (APAN)**

In closing, Dr. Sawhney thanked everyone for coming and participating in the training and hoped it is useful for them. She then asked the participants if there are questions for expectations that are not met. Of which, none was raised.

She then continued by saying that APAN tries to build the capacity of the different stakeholders in the region. She also added to let her know if there is any requirement from any country, region, on a particular topic.

And lastly, she thanked ICLEI and SEARCA for organizing the training.





## ANNEXES



### Annex 1: AGENDA CLIMATE CHANGE ADAPTATION TRAINING 20-21 September 2012 The Royale Bintang Kuala Lumpur, Malaysia

20 September, Day 1		
09:00 – 09:40	Preliminaries: <ul style="list-style-type: none"> <li>· Opening Remarks</li> <li>· Self-Introduction and Expectations Check</li> </ul>	<i>Mr. Mozaharul Alam, Regional Climate Change Coordinator, Regional Office for Asia and the Pacific, United Nations Environment Programme</i>  <i>Mr. Purnomo Dwi Sasongko, Semarang Development and Planning Board/Member, ICLEI Southeast Asia Regional Executive Committee</i>
09:40 – 10:45	Climate Change in Southeast Asia: A Refresher	<i>Dr. Puja Sawhney, Coordinator of the Regional Hub for Asia Pacific Climate Change Adaptation (APAN), IGES</i>
10:45 – 11:00	Coffee / Tea Break	
11:00 – 12:00	Climate Change Adaptation: An Overview	<i>Mr. Mozaharul Alam, Regional Climate Change Coordinator, Regional Office for Asia and the Pacific, United Nations Environment Programme</i>
12:00 – 13:00	LUNCH BREAK	
13:00 – 14:00	Framework on Mainstreaming CCA in Development Planning	<i>Mr. Marino Deocariza University of the Philippines</i>
14:00 – 14:45	Mainstreaming CCA in National Development Planning: A Case Presentation	<i>Ms. Julie Amoroso Technical Officer Climate Change Commission, Philippines</i>

14:45 – 15:30	Mainstreaming CCA in Local Development Planning: A Case Presentation	<i>Ms. Colleene Lacsamana City Environment and Parks Management Officer Baguio City, Philippines</i>
15:30 – 15:45	Coffee / tea break	
15:45 -17:30	Group Exercise #1: Identification of Entry Points for Mainstreaming	
<b>21 September, Day 2</b>		
09:00 – 09:15	Recap of Day 1	
09:15 – 10:30	Plenary Presentation of Group Exercise #1	
10:30 – 11:30	Role of Science and Information Technology in Climate Change Adaptation	<i>Mohan Kumar Sammathuria Meteorological Officer Numerical Weather Prediction Division, Malaysian Meteorological Department</i>
11:30 – 11:45	Coffee / tea Break	
11:45 – 12: 30	Adaptation Technologies	<i>Dr. Heng Chan Thoeun Deputy Director of Climate Change Department Ministry of Environment Cambodia  Sukallaya Kasem Economist Professional Level Office of Agricultural Economics, Ministry of Agriculture and Cooperatives Thailand</i>
12:30 – 14:00	LUNCH BREAK	
14:00 – 15:00	Prioritizing Climate Change Adaptation Measures	<i>Mr. Gurmit Singh K.S. Chairman Centre for Envi- ronment Technol- ogy and Develop- ment, Malaysia (CETDEM)</i>



## Annex 2: List of Participants

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