Urban Climate Change Adaptation and Resilience

Module 1: An Introduction to Climate Change Resilience
To the Facilitator: For this module series you will need to arrange the classroom so that the participants can easily move their individual tables or seats together to engage in group work. The module uses a combination of collaborative activities and facilitator-led discussions, and so the participants will need to be able to shift from their small groups to the plenary efficiently and without interrupting the flow of the modules. Also adjust the date on the slide so that it is correct.

Suggestions from Previous Iterations of this Training: During the piloting of this training, the setup that has worked best has been to have participants sit around group tables with seating for up to 8. Depending on the composition of the participants, you may or may not to randomize the groups. If all of the participants come from the same municipality or region, it may be necessary to randomize the groups. Likewise, if there are several participants from an NGO, particular government agency, or academic institution, effort should be made so that all the members from these groups are not seated together. In some cases, participants from multiple regions or municipalities may be in attendance. If possible, group participants together based on where they are from. This will allow them to work together on local issues throughout the training.

Notes FOR MODULE 1: This is the introductory module for the series and should take approximately 3 hours. This module series is somewhat unconventional because there is no “introduction”. Rather one of goals of this introductory module is to encourage interaction between the participants that is centered on addressing an issue: impacts of climate change on their municipality or region. It has been shown through practice that
one of the most important determinants of successful adaptation and resilience building is cross-sectoral coordination, and cooperation between government and non-government agencies at all levels (e.g. international, national, regional, local). At the same time, a major obstacle to successful adaptation and resilience building is lack of coordination, and in some cases actual antagonism between different agencies and stakeholders.

Therefore the module envisions interaction between the participants before they get to know one another and what agency they represent, and what their position within the agency is. We want to encourage the participants to interact as individuals, rather than as representatives of organizations. This is why the module does not feature conventional introductions at the beginning. Hopefully this will help the participants build trust, which will help them to develop connections and networks that will later prove to be an important asset when working to develop and mainstream climate change adaptation and resilience building measures. To the Facilitator: For this module series you will need to arrange the classroom so that the participants can easily move their individual tables or seats together to engage in group work. The module uses a combination of collaborative activities and facilitator-led discussions, and so if you are using a plenary-style seating arrangement, the participants will need to be able to shift from their small groups to the plenary efficiently and without interrupting the flow of the modules.

Materials Needed:
--Whiteboard and markers
--Flipchart
--LCD projector to display module 1 presentation

If possible, equip each participant group with their own LCD projector and laptop along with necessary cables and a projection screen or wall area. The use of group LCD projectors is optional, but pilot testing showed that this was a very effective method of completing the group work in later modules.
This first module:

• Describes the importance of adaptation
• Discusses urbanization trends globally and more specifically in Asia
• Provides an overview of the concept of resilience
• Describes the “systems approach” that will be utilized in this course
• Covers ground rules and logistical considerations

The Learning Objectives of this module are to

• Explain why climate adaptation and resilience building are important
• Describe climate adaptation in the context of city systems
• Identify the goals and objectives of the course
Note to Facilitator: First you should introduce yourself: state your name, position, country of origin and/or residence, a little background about yourself either professionally or personally, perhaps a short, funny story about yourself or something that just happened to you.

We need to mention that the USAID Climate Change Adaptation Project Preparation Facility for Asia and the Pacific Project (USAID Adapt Asia-Pacific) is the sponsoring entity of this course and is responsible for its contents and presentation.

Details about ADAPT Asia-Pacific: The financing needs for climate change adaptation in developing countries for 2010-2050 are estimated at $100 billion per year, equivalent to current official development assistance levels across all sectors. As part of the 2009 Copenhagen Accord, Parties to the United Nations Framework Convention on Climate Change agreed to provide eligible countries worldwide $30 billion in "fast-start" financing for 2010-2012, while setting a goal of mobilizing $100 billion per year by 2020. Developing countries, however, face major capacity challenges in preparing project proposals to access these funds. An urgent task for the development community, therefore, is to assist developing countries in preparing high-quality adaptation projects.

The principal objective of ADAPT Asia-Pacific is to establish a fully functional and self-sustaining adaptation project preparation facility that will not only support preparation of specific projects, but also build the capacity of the region’s governments to
independently access climate adaptation funds. To establish a sustainable project preparation facility, ADAPT Asia-Pacific works closely with funding organizations and government agencies from countries across the region in focused activities in five key areas: (1) sustainable regional knowledge sharing platform; (2) annual forum to bring adaptation funds and project proponents together; (3) climate change adaptation project capacity building program; (4) technical assistance in preparing funding proposals; and (5) overarching program management and coordination for the aforementioned four technical tasks. As cross-cutting themes, ADAPT Asia-Pacific will promote regional networking, gender and other social equity issues.

Mention each line as it appears. No hurry, but neither do you need to linger on any point very long as we will cover each point in the same sequence starting with the next slide.
Note to Facilitator: these points should be made rather briefly as they will be addressed in much greater detail subsequently. However, if any questions arise about them, you could give a very simple and brief response about any or each of the points below. First though it is important to make some general points about the role of cities in adaptation, and so we have included some general guidance below. You may wish to include some additional information specific to your country. If there are tie ins to national, provincial, or regional laws, plans, etc related to climate change, you should provide some information as to how this training is consistent with those plans.

Why are we here? Everyone in this room is aware that climate change is happening, and it poses a major challenge for governments at all levels. Since awareness of climate change issues started to become widespread in the early 1990s, the focus has for the most part been on mitigation, which refers to addressing the problem of climate change by limiting the causes of climate change impacts (i.e., by decreasing greenhouse gas (GHG) emissions, particularly methane (CH4) and carbon dioxide (CO2). Most of us are familiar with efforts to cut down on carbon dioxide. However, with some exceptions, mitigation efforts generally take place at the national and international levels. You may have heard about the international negotiations taking place in Paris in 2015. This meeting is the 21st meeting of the Conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC), and the purpose of it is to hammer out an international agreement that will be the successor to the Kyoto Protocol.

It makes sense that these mitigation efforts take place at the national and international
levels, because national governments are good at coordinating efforts across the whole country. Moreover, mitigation requires a significant amount of negotiation between countries, and this is the responsibility of the national government. However, over approximately the past decade it has come to be accepted that no matter how successful mitigation efforts are, there will still be significant impacts associated with climate change due to the GHG gases that are already in the atmosphere. Thus it is very important to begin thinking about adaptation as well.

**Adaptation** refers to strategies and interventions aimed at dealing with the impacts of climate change. This is easier said than done, for a number of reasons that we’ll discuss in this course. But the important thing to note now is that while mitigation is the domain of the national government, adaptation is more appropriately addressed at the local, municipal, or regional level. Why is this the case? There are a number of reasons for this. Whereas GHG emissions affect the entire atmosphere, which is a global commons, the impacts of climate change vary from place to place depending on a wide variety of factors. Thus the fact is that climate change impacts and the adaptation strategies and interventions you employ to combat them are going to be different in your city than in other cities.

Second, adaptation requires a thorough understanding of local capabilities and vulnerabilities. You are the people that have this information, and so you will take a leading role in adaptation.

Third, adaptation is going to require a great deal of communication, cooperation, and coordination between different stakeholders, both inside and outside the government. This type of coordination is best handled at the local level.

So, with that in mind, this module series is going to help you prepare for challenges associated with adapting to climate change impacts and building greater resilience to impacts that may not be anticipated or prepared for adequately since they may manifest themselves in unexpected ways and places, or at unexpected times. It is also going to help you to recognize opportunities to realize sometimes large and important benefits associated with adaptation and resilience-building (called “co-benefits”) that may be gained at the local level from taking such actions.

**#1: Developing climate change adaptation and resilience policies.** This course is designed to help you develop climate change adaptation and resilience (CCAR) policies at the municipal/regional level. In many places throughout the Asia-Pacific region, higher levels of government have created a mandate for local governments to either develop specific climate change adaptation plans, or to mainstream climate change adaptation into existing development plans, spatial plans, disaster risk reduction plans, and so forth. This course will provide some general guidelines as to how to develop CCAR policies and mainstream them into existing mechanisms of government.

**Facilitator note:** Here you should describe the legal framework and any existing mandates related to climate change adaptation. For example, if you are implementing this training in the Philippines, describe the national government rules for developing Local Climate Change


Adaptation Plans (LCCAP)

#2: Tools and Methods for Addressing Vulnerability. We will demonstrate an analytical process of finding available data and determining local stakeholders’ and residents’ perceptions on various threats posed by climate change threats. These threats include things like rising sea levels, more intense hot days, longer droughts that happen more often, and more intense rain downpours.

First, we will work with you to identify the principal climate change “threats” facing your city or town. Then, we look at its potential impacts in terms of who is likely to be most affected, where those impacts are likely to occur, and what ‘things’ (urban assets, services, or functions) are most likely to become impaired or not function properly. This is called “Exposure.” We also look at the different “Sensitivities” of these different people, places, and things as they differ from one another. Sensitivity refers to the degree to which an asset, service, or function is susceptible to a particular impact. Some aspects of the urban environment are more sensitive than others. These two factors, which we score or ‘rank’ them, result in the expected “Impact” of a given climate change threat.

Next, we move from “Impacts” the extent to which we are likely to suffer from climate change to our “Vulnerability” to those impacts is based upon an assessment of our Adaptive Capacity, that is to say, the extent to which different people, places or things are likely to be affected by those impacts. In other words, Adaptive Capacity is our ability to sustain a shock or blow and to carry on with our normal functions, or adapt in new ways to continue providing basic public services and functions to the citizens of our city or town. It is an estimate of how well we think we can reduce climate risks and take advantage of some new opportunities they may provide. Simply put, it is an estimate of our “resilience” to climate change impacts.

This next ‘phase’ in the whole adaptation and resilience building process is to help us systematically and consensually move from identifying our biggest concerns (“priority vulnerabilities”) to identifying and assessing the adaptation and resilience building options available to us in terms of a number of ‘evaluative criteria”. This will require the participation of a variety of stakeholders. The Rockefeller Foundation’s ACCRN uses a process called “Shared Learning Dialogues” (SLD) to reach those decisions on our priority action items. Shared learning dialogues are a proven method of involving a wide range of stakeholders in the adaptation and resilience building process. Not only do shared learning dialogues facilitate trust building and the sharing of information, but they also enable you to draw on the strengths, knowledge, and capabilities of stakeholders that might otherwise not be involved in processes of governance, thereby strengthening the CCAR process. Shared Learning Dialogues represent one of a number of different group processes that may be used to engage stakeholders at various spatial resolutions and jurisdictions to identify vulnerabilities and develop resilience building options. Though we will discuss shared learning dialogues at a middle stage in the CCAR process, SLDs should be incorporated at the very earliest stages of CCAR. These priorities should then be integrated or “mainstreamed” into our local planning, programming, and budgeting processes, decisions, and capital investments.
#3: Accessing Financial and Technical Climate Change (and Disaster) Assistance. This focus of the course is anchored in the processes and requirements of national governments and international development and lending institutions. It will demonstrate in specific terms the steps in the project preparation and approval processes to obtain loans and grants from such institutions. This is expected to be an area where many participants will be keenly interested to better understand. Therefore, it will be addressed in some detail so that participants will have a much better idea of what is involved in seeking such technical and financial assistance from these different levels of public institutions, and to a lesser extent promising sources of potentially large amounts of financial and technical assistance coming from the insurance industry, retirement pension funds, and investors and investment fund managers or companies in the private sector. Moreover, this section of the workshop aims to provide information about emerging trends in climate finance that we anticipate based on our readings of the most recent literature on the subject and developments in the field.
**Note to Facilitator:** the point of this powerful graphic (on right-hand side of slide) is that urban populations are growing dramatically while rural populations are remaining relatively stable with slight growth. That is why we are focusing on urban areas, and in particular, secondary cities since most of the urban growth is occurring there and not as much as in the “mega-cities.” (reference: *Building Sustainability in an Urbanizing World*, World Bank pub, July 2013; among several others.)

The four points on the left side are all important, but self-explanatory.

**Point #1:** The global urban population is expected to double from 3.7 billion to over 7 billion in next two decades (by 2030), most of it in urban slums of cities in developing world, particularly in South Asia and Sub-Saharan Africa. (Ref: * Systems of Cities* report, World Bank, p.1 (foreword), 2009 and WB 2013 reference above.)

**Point #2:** Various studies, practically all, mention poorer urban residents as the key group to build Resilience strategies and programs around. They comprise a large proportion of the “vulnerable populations” that are cited by many World Bank and UNDP (among others) as key to address in taking a “pro-poor” approach to building resilience and sustaining social and economic progress/development.

**Point #3:** the costs of climate-induced “disasters” is climbing rapidly, and is expected to
accelerate even more in the next 10-20 years as more and more climate change impacts take their
toll on human life, assets, and livelihoods as well as on ecological systems providing enormous
and multiple types of benefits to society that are not incorporated into national accounting
systems of gross national product (GNP) or gross domestic product (GDP). Cities are particularly
“vulnerable” to CC impacts because many of the world’s largest cities are located in low-lying
coastal areas or along major rivers, and other vulnerable sites (mainly due to their historic trading
and political advantages provided by the location on major river or ocean commercial routes).
Despite this vulnerability, most cities are not prepared for or equipped to deal with CC impacts.
Since they have not yet incorporated climate change adaptation and resilience (CCAR) measures
into their annual planning & budgeting processes nor incorporated them into their longer-term
capital improvements budgets for public facilities and infrastructure, they are ill-prepared for and
not resilient to coming CC impacts. As we will see in a moment, costs for climate change related
disasters are increasing.

**Point #4**: Lastly, climate change threatens much of the progress made over the past few decades
in terms of improving the human condition around the world. Climate change is a fundamental
threat to development, and if we don’t confront climate change we will not be able to end
poverty. Climate change and global warming will have impacts on agriculture, water resources,
ecosystems, and human health, and these impacts will be far worse if we do not take action to
adapt. In the words of US Secretary of State John Kerry: “On a range of crosscutting issues from
global hunger to global health, changing global temperatures and weather patterns will inject a
new element of chaos into the already-fragile existences of the world’s poorest people. Among
the predictions are more famine and drought, expanding epidemics, more natural disasters, more
resource scarcity and significant human displacement.”

Note that John Kerry made this statement in an editorial article in 2010 when he was still a US
Senator. The source for the quotation is http://www.huffingtonpost.com/john-kerry/climate-
change-development_b_733060.html
This graph from 2010 makes the point visually that population growth is happening most dramatically in less developed countries (LDCs). And among these populations, the majority of growth (70%) is occurring in secondary cities, not the mega-cities of the world, and are primarily fueled by migration of rural poor into those cities looking for better employment opportunities.
Though this course was developed specifically for urban areas in the Asia-Pacific region, in principle there is no difference in adaptation needs between rural and urban areas, and in fact effective adaptation requires acknowledgment of the complex interlinkages between urban and rural areas.

The urban “footprint” refers to the fact that cities are not able to provide all of the critical inputs they need. Cities rely on surrounding areas for food, water, energy, etc. Thus cities are vulnerable if climate change affects these critical support systems beyond their borders.

For example, watersheds and foodsheds are “critical inputs” for cities. Threats such as deforestation, drought, flooding, etc in rural areas can directly affect cities. They can also indirectly affect cities by creating pressures for rural-urban migration.

Therefore, when planning for adaptation and resilience, while we emphasize cities in this course, we recognize linkages between urban and rural areas in affecting livelihood conditions in cities. Thus in many cases it is advantageous to develop strategies that address the rural-urban connection.
Facilitator: This graphic compares the occurrence of “geophysical disasters,” which includes earthquakes, volcanoes, landslides, and similar events to “climate-related disasters,” which includes hydro-meteorological events like floods, storm surges, coastal flooding, storms, typhoons and cyclones, heat waves, droughts, and wildfires, all of which are either influenced by or related to climate change. The period covered is over 60 years from 1950 until 2012, the last year for which data are available.

Note that the number of geophysical disasters has remained relatively stable over time, with a slight upward trend. However, the number of climate-related disasters has increased significantly. For example, there were three times as many natural disasters between 2000 and 2009 compared to the amount between 1980 and 1989. Almost ALL of this growth is due to climate-related events.

As might be expected, the economic costs associated with disasters has increased significantly as well. According to a 2013 study in the New England Journal of Medicine, the scale of disasters has expanded, owing to increased rates of urbanization, deforestation, environmental degradation, and intensifying climate variables such as higher temperatures, extreme precipitation, and more violent wind/water storms.

The New England Journal of Medicine article also describes indirect impacts of the changing climate: “natural disasters, particularly floods and storms, will become more frequent and severe because of climate change. Organized deadly onslaughts against
civilian populations will continue, fueled by the availability of small arms, persistent social and political inequities, and, increasingly, by a struggle for natural resources. These events affect the mortality, morbidity, and well-being of large populations.”

This image appears on the accuweather website (http://www.accuweather.com/en/weather-blogs/climatechange/steady-increase-in-climate-rel/19974069) and is from the EM-DAT International Disaster Database from the Center for Research on Epidemiology of Disasters, University of Louvain.


The article is available for free online at http://www.nejm.org/doi/full/10.1056/NEJMr1109877?query=featured_home&.
The major point of this slide is to emphasize the importance of mainstreaming climate change adaptation into current development programs and policies, and that mainstreaming is about improving capacity in government and developing stronger institutions.

While the occurrence of climate related disasters as well as the social and economic costs associated with them are increasing, many parts of the world face pre-existing development challenges. This is especially true in many developing countries, where adaptation needs are anticipated to be the highest and adaptive capacity is often the lowest. There is a gap, which the UN refers to as the “adaptation gap”, between what developing countries are currently prepared for and what they could be prepared by mainstreaming climate change adaptation considerations in their development plans. The adaptation gap is linked to development. In areas that are lagging in terms of development attributes, like education and health, the people tend to be more vulnerable to the impacts of climate change and less able to adapt. At the same time, in places where adaptation is not a part of development planning and implementation, initiatives and projects designed to improve the overall well-being of the population can be undermined by climate change impacts. Thus the important point to make here is that we should start thinking about the impacts of climate change as not just physical impacts, but also socio-economic as well.

However, in places where the government has started to plan for climate change, there is a strong bias towards engineering solutions. For example, the threats of sea level rise
and flooding are usually addressed with dikes, armored coasts, and beach nourishment. These are important and useful tools, but they are extremely expensive, and they require large and ongoing expenditures for maintenance. Moreover, these “solutions” often do very little to address the root causes of vulnerability. A report released by the UNEP in December of 2014 suggests that the costs for adaptation through infrastructure and hard engineering will become prohibitively expensive into the future, diverting a larger and larger percentage of the national budget. These kinds of solutions also are not good at addressing the uncertainty associated with climate change, and they don’t do much to address the socio-economic adaptation gap.

Because of the tremendous costs associated with infrastructure solutions, there is a big need for non-technical adaptation, which includes capacity building and soft measures. This types of measures address socio-economic vulnerability and complement infrastructure approaches. The big challenge here is in increasing the ability of people and institutions to adapt to climate change impacts (in later modules we refer to this attribute as “adaptive capacity”). At the same time though there are opportunities here because your municipality likely already has programs addressing existing development challenges, so incorporating climate change considerations into these programs can provide co-benefits.

We also know that the longer mitigation and adaptation are delayed, the greater the adaptation gap will become. This has two very important practical implications. The first is that impacts from climate change will be more severe in terms of losses of life and property. The second is that in the future the costs of addressing the impacts of climate change will increase. Moreover, adaptation to future climate change will be less effective if current gaps have not first been addressed. So it is better to start making investments now.


2014 UNEP’s “1st Adaptation Gap” report found that:

- Current estimates of CCA costs of US $70-100 billion/year “significantly underestimate” future costs
- Based on current trajectory of 3.7° increase in global temperatures, costs could be 3–5 times higher
- “Plausible” costs are estimated at US $150 B/year by 2025 and US $250 - 500 B/year by 2050.

Majority of CCA costs in developing countries will be for:

- Coastal zone defenses > Water supply/flooding
- Infrastructure


**Bullet 1:** This estimate comes from the Inter-Governmental Panel on Climate Change (IPCC) 5th Assessment Report (AR5) of 2014, which reported the most recent global adaptation cost studies, and reiterated the range of US$70 billion to US$100 billion per year globally by 2050 for developing countries that was based primarily on the World Bank’s 2010 study on *The Economics of Adaptation to Climate Change: A Synthesis Report*. The World Bank Group. Washington, US.

**Bullet 2:** Subsequent critiques (Parry *et al*. 2009) of the EACC estimates concluded that those figures (US $70-100B/year by 2050) significantly underestimated actual adaptation costs by a factor of 2 to 3 for the seven countries and sectors considered. Complementary regional studies, including Africa’s Adaptation Gap Report (UNEP 2013) and an ADB study (2014) on the Economics of Climate Change for South Asia also indicated higher adaptation costs than the global EACC report. Furthermore, those estimates were only partial, leaving out important sectors and other factors that would likely increase costs. Several more practically focused studies An analysis done recently (2014) by the European Union (EU) 7th Framework Program-funded ECONADAPT Project analyzing several hundred CCA-cost studies, indicated that important cost categories were being ignored in current estimates and that implementation challenges posed by the fact that the “predict-and-protect” approach often misses catastrophic climate change impacts (thereby necessitating a more “resilience” based approach of preparing for a broad range
of possible and unexpected impacts, means that costs are likely to be higher in practice in the future. Finally, and perhaps most importantly, the EACC estimate assumed that the world would embark on an emission pathway that would limit global warming to 2°C increase above pre-industrial levels, which is the current long-term global goal identified under the UNFCCC process. However, as illustrated in the Emissions Gap Report (UNEP 2013), the world is currently on an emission trajectory that corresponds to global warming in the range of 3.7°C (UNEP, Adaptation Gap Report, p. 22; 2014).

**Bullet 3:** An alternative set of 15 country case studies of future adaptation costs to 2030 produced under the UNDP’s Investment Financial Flows (IFF) initiative, focusing on one or two key sectors each, primarily agriculture and/or water, resulted in an estimate of total additional adaptation needs across all 15 countries at US$5.5 billion/year in 2020, rising to US$7.1 billion/year by 2030. This 1st Adaptation Gap report puts those estimates of future costs at even higher levels (indicated above), rising over time and due to delayed actions to reduce GHG emissions.

**Bullet 4:** Source document for this last bullet is *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II (WG2) to the Fifth Assessment Report (AR5) of the IPCC* (2014). This analysis covered only “public” costs, and not private costs borne by ordinary citizens, such as the costs of replacing or repairing damaged property, homes, cars, and other assets; or loss of income or livelihoods (markets, buyers, clients, etc) caused by the indirect impacts of CC on economic dislocation and lost employment opportunities.
The video attached to this slide should start when you click on the slide. The video is a TedTalk by Vicki Arroyo entitled “Let’s prepare for our new climate. The video is 10m35s and can be accessed online at http://www.ted.com/talks/vicki_arroyo_let_s_prepare_for_our_new_climate#t-35369.

This video touches on a number of issues that are related to our modules. The talk is about being prepared for and resilient to the changes that are coming from climate change. Some of the important concepts that are touched upon include:

--Unequal distribution of impacts from climate change

--Most vulnerable groups include the elderly and female headed households

--Climate change fuels conflicts (Chad and Darfour)….this is indirect impacts…climate change as a threat multiplier that can undermine security and stability

--Climate change is an unavoidable reality that has to be addressed.

--Hard engineering is part of the solution
--Acting proactively

--Human element, including planning and systems is an extremely important part of building adaptation and resilience.

--Working with stakeholders so that the stakeholders are empowered to adapt to climate change

--Sharing costs of adaptation with the private sector

--Co-benefits and win-win-win solutions

--Ecosystem services from mangroves

--Protection, accommodation, conservation

--“There are no experts”…adaptation is uncharted territory. Learning by doing.

You may also download versions of the video with Chinese, Indonesian, or Vietnamese subtitles, or you can turn those on via the website.
In this slide we are discussing some of the overarching concepts and themes that will run through all of the modules in the course. “CCAR” is an abbreviation for “Climate Change Adaptation and Resilience”.

The first major point is that CCAR is a complex problem, and it is not limited to one sector or area. In addition, as we will see in module 2, the impacts of climate change can be slow or sudden onset, and they can be direct or indirect or ripple impacts. Because of this we would encourage you to think about climate change and its impacts from a systems perspective. Building the capacity of a single actor or strengthening a single relationship is insufficient. Rather, the focus must be on the system as a whole; the actors, their interrelationships and the incentives that guide them. Systems thinking refers to a set of analytic approaches—and associated tools—that seek to understand how systems behave, interact with their environment, and influence one another. Common to all of these approaches is a conviction that particular actions and outcomes are best understood in terms of interactions between elements of the system.

Facilitator: Here you can point out that additional guidance on systems thinking in the context of local governance is available in the pictured document, Local Systems: A Framework for Supporting Sustained Development, which is available for download from USAID. The principles described in this short document can and should be applied to CCAR. The URL to download the document is http://www.usaid.gov/sites/default/files/documents/1870/LocalSystemsFramework.pdf. A PDF of the document is also included in the resources pack that the participants will
The second major point is that CCAR is a participatory process. This cannot be stated enough. We have already recognized that climate change is a “wicked problem” that cuts across scales, agencies, and jurisdictions, and as such is not amenable to easy, sector specific solutions. In the past this has provided to be problematic in many places because there is no clear institutional mandate for any one agency to address climate change. This is an obstacle that will need to be overcome if CCAR is to be successful. Additionally, because CCAR is such a complex problem, understanding the impacts and implications at the municipal level requires information and perspective from a wide variety of sources, both inside and outside the government. Moreover, these diverse stakeholders bring their own capabilities which will contribute to overall adaptive capacity. Diversity breeds creativity and innovation, which are key attributes in building resilience.

At the same time it is important to remember that when you have broad stakeholder involvement, different stakeholders are going to have different values, interests, perspective and priorities, and so there are bound to be differences of opinions and disagreements. If managed properly, these differences can be generative, in other words they can give rise to innovation and creativity. If they aren’t managed effectively, differences and dissent can undermine the CCAR process. Therefore it is essential to develop trust between the various stakeholders and interest. As with other aspects of governance, accountability and transparency are important ingredients in constructive participatory processes. This involves openness and information sharing processes. In one of our modules we will learn about Shared Learning Dialogues (SLD) as a tool for fostering relationships between various stakeholders, and treating stakeholders as partners in the CCAR process.

Fourth, climate change adaptation and resilience building isn’t simply a task; instead it is a process that requires an ongoing commitment on the part of all stakeholders. Therefore CCAR needs to be incorporated into standard aspects of governance, from the project level all the way up to city-wide coordination of agencies and strategic visions. This is referred to as “mainstreaming”. As you go through this course we would encourage you to think about ways that CCAR can be incorporated into the things your agency already does, and how it might be made a part of your agency’s strategic plan.

Lastly, climate change adaptation and resilience building efforts at the municipal level need to be harmonized with national level strategies and international trends in climate finance. This allows your city to draw on outside support for designing and implementing CCAR strategies. Thus as we go through the modules, think about how you would develop “bankable” projects and program proposals with an eye towards accessing climate financing from the national and international levels, as well as from the private sectors.
When thinking about kotas, kabupatens, barangays, cities, regions, and communities, we must remember that they are complex systems. Achieving and sustaining disaster risk reduction and climate change adaptation and resilience depends on the contributions of multiple and interconnected elements.

Systems thinking is a set of analytic approaches, and associated tools, that seeks to understand how systems behave, interact with their environment, and influence each other. Systems thinking operates on the premise that particular actions and outcomes are best understood in terms of interactions between elements in the system. Experience has shown that discrete interventions targeting a particular agency, organization, or set of individuals does not always translate into the reductions in fragility or increases in resilience, adaptability, accountability, or sustainability that are needed. The focus, then, needs to be on the system as a whole.

Local systems consist of a number of different components which interact and affect one another. These include

--Urban Agents, including government, civil society, the private sector, universities, individual citizens.
--Processes and institutions, including formal and informal rules
--Physical infrastructure and assets
If we think about the city, district, or community from a systems perspective, we can realize that there are a number of approaches that can be used to develop resilience and adaptive capacity to climate change, as well as to reduce disaster risk. These approaches work together and mutually reinforce one another if designed and implemented with care.

Some key principles of a systems approach are:

1. Recognize that there is always a system. Thus systems thinking can provide insights into the operating environment, including perspective on why things are the way they are and what needs to change; the identity of key actors and relationships, the contours of power and interests, drivers of vulnerability, and opportunities and impediments to improved development outcomes and their sustainability.

2. Map the local system at an early stage in the DRR-CCAR process. Drawing on local knowledge, the aim is to sift through varying perspectives to reveal the contours of the local system, its boundaries, the key actors, and their interrelationships, and the strengths and weaknesses of the system. This mapping should be undertaken with all stakeholders and can promote a common understanding of a system and its dynamics, and establish common ground for coordinating multiple interventions.

3. Holistic design. Effected DRR-CCAR planning addresses the system as a whole, incorporating discrete activities and interventions that together will strengthen the system and produce sustainable results.
A major focus of this training series is to help you develop resilience to climate change in your city systems. The Intergovernmental Panel on Climate Change (IPCC), which we'll learn more about in module 2, defines resilience as “the capacity of a social-ecological system to cope with a hazardous event or disturbance, responding or reorganizing in ways that maintain its essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation” (Source: AR 5 glossary available at https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/drafts/fd/WGIIAR5-Glossary_FGD.pdf).

Sometimes resilience is thought of as the ability to “bounce back” from a shock. Resilience doesn’t remove the threat, but implies that a person, or a system, a city or an organization is able to recovery relatively quickly. Resilience is a characteristic of systems that was first understood in terms of ecological systems, but over the past few decades the concept has been applied to social systems as well.

As we can see from the simple diagram on this slide, resilience entails a couple of important elements. The first is the ability to absorb a shock without too much damage. The diagram shows two separate trajectories. The second element is the ability to recovery quickly. In this diagram we see the “disaster threshold”. This defines the point at which a hazard event, like a storm or an earthquake, overwhelms the local capacity to respond. Increasing resilience means that hazard events are less likely to overwhelm local capacity.

Then in the recovery period, resilience is key to bouncing back. We see three trajectories here. Look at the red line; in one case the system is able to bounce back after the disaster and
get back to normal. However, in the low resilience case, the system is permanently altered to a lower functioning level. Can you think of any examples of this?
There are several principles that should be incorporated into the CCAR-DRR process, and subsequent mainstreaming of CCAR and DRR into processes of governance. Here we will briefly discuss these principles. As you develop your CCAR-DRR plan, your team should discuss these terms and define them explicitly in your CCAR-DRR document, making sure to frame them in terms of the local context. Incorporating these principles into your CCAR-DRR process will not only increase support among the local community and the sustainability of CCAR-DRR efforts, but it will also harmonize local efforts with national and international standards.

Transparency refers to the availability of information about decision making processes. Public officials, and others involved in the CCAR-DRR process have a duty to act visibly, predictably, and understandable. Information about decision-making processes should be managed so that it is accessible and relevant, as well as timely and accurate.

Accountability is enabled by transparent processes. It means that officials are answerable and responsible for their actions, and that there is a mechanism of redress when this responsibility to the public is not met.

Participation includes understanding the variety of stakeholders within your district, city, or community, and involving them in all stages of the CCAR-DRR process. Public engagement enhances the government’s effectiveness, improves the quality of decisions and actions and increases the legitimacy of decisions. Knowledge is widely dispersed in society, and public officials benefit from having access to that dispersed knowledge. At the same time it is important to recognize that there are different levels, fora, and approaches to engagement that are appropriate for different circumstances.
DRR=Disaster Risk Reduction

Here on this slide we see the role of adaptation and resilience in the general disaster risk reduction cycle, which includes four steps:

1. Mitigation of hazards and their impacts. This includes actions and policies that serve to decrease impacts of climate and other hazards
2. Preparing for impacts. This includes actions that help the community “weather the storm”
3. Response. This includes policies, actions, assets, and procedures that are put in place to handle the impacts of an active disaster.
4. Recovery. This refers to how the community bounces back from a disaster event. Recovery begins after the response stage.

Adaptation and resilience building work hand in hand to strengthen each step of the disaster management cycle.

OPTIONAL DISCUSSION (these questions have not been used in pilot testing of the materials):
1. What makes communities resilient?
2. In the face of a disaster, they will recover more quickly because…..
In this diagram we can see the spatial and temporal scale of hazards. As we will see in module two, some impacts are immediate onset impacts, and happen over short time scales. Others affect relatively small spatial units. On the other hand some hazards are longer onset, meaning that they don’t just occur and finish. Still other hazards affect large areas. Because of this, we need to develop resilience strategies that are effective against a wide range of hazards.
These principles come from the United Nations Office for Disaster Risk Reduction’s How to Make Cities more Resilient: A Handbook for Local Government Leaders. A PDF of this handbook is included in the resources pack that is provided to participants. The handbook can also be downloaded at this URL: http://www.unisdr.org/files/26462_handbookfinalonlineversion.pdf.

Though they are written for DRR, we can apply them to CCAR as well.

1. Disasters are minimized and resilience to climate change impacts is maximized because the population lives in homes and neighborhoods with organized services and infrastructure that adheres to sensible building codes; without informal settlements built on flood plains or steep slopes because no other land is available.

2. The city has an inclusive, competent, and accountable local government that is concerned about sustainable urbanization and that commits the necessary resources to developing capacities to manage and organize itself before, during and after a natural hazard event.

3. Local authorities and the population understand their risk and develop a shared, local information base on disaster losses, hazards, and risks, including who is exposed and who is vulnerable.
4. People are empowered to participate, decide and plan their kabupaten/kota/city/barangay/region together with local authorities and value local knowledge, capacities, and resources.

5. The city has taken steps to anticipate and mitigate the impact of disasters and climate change, incorporating monitoring and early warning technologies to protect infrastructure, community assets, and individuals, including their homes and possessions, cultural heritage, environmental and economic capital, and is able to minimize physical and social losses arising from extreme weather events, earthquakes, or other natural or human-induced hazards.

6. The community is able to respond, implement immediate recovery strategies, and quickly restore basic services to resume social, institutional, and economic activity after an event.

7. The community understands that most of these tenets are central to building resilience to adverse environmental challenges, including climate change.
This slide provides an overview of the modules in this training series. The modules correspond to the general steps in creating a Climate Change Adaptation and Resilience Plan. There may be local variations on exactly what goes in a climate change plan, but in general most include some or all of the information on this slide. The modules are structured to walk the participants through each of these stages and to help them develop a skeleton outline for their own CCAR plan, that can be completed after the training series has concluded.

Note that several of the stages will be handled in the same module.
ACTIVITY/DISCUSSION: Forming a Steering Committee. This activity requires the use of a white board or flipchart. This activity can be done in breakout groups or as a plenary discussion. The results should be saved for reference for later activities.

A steering committee provides overall guidance for developing policies and strategies for increasing adaptive capacity and resilience. There are no hard and fast rules that govern the composition of a steering committee. But in general, some principles apply. For example, a steering committee should:

--Have support from the executive branch
--Include advisors from multiple government agencies
--Include representatives from the private sector, NGOs, and other civil society organizations
--Have defined procedures for meeting
--Employ transparent practices that are accessible to the general public
--Have a clear and defined mandate concerning the product. E.g., what does the steering committee do?

The point of this slide is to begin thinking about the participatory nature of climate change adaptation and resilience building. As noted earlier in the module, CCAR is a local endeavor, and there are many resources available in your community.
Facilitator: Using the whiteboard or flip chart, draw a circle with the words “Climate Change” (like the slide). Then ask the participants what stakeholders should be involved in planning for climate change.

Write each of the stakeholders on the whiteboard or flip chart in a smaller circle linked to the “Climate Change” circle. For each stakeholder group or agency the participants name, ask why that stakeholder should be involved in the planning process. Then ask what strength, advantage, asset, or capacity that particular stakeholder group or agency has. Then ask the participants to suggest ways in which that stakeholder group or agency should be involved.

The participants should describe some non-government stakeholder groups, but if they don’t you should be prepared to give them hints. The goal is to have as inclusive a list as possible. The message here is that climate change adaptation is not the job of one agency alone; it is a complex issue that impacts many agencies and stakeholder groups, and as such it requires participation, input, and cooperation from many stakeholders.

Once the list is created, point to the list and say that all of these groups represent the intended audience of the module series. If the list doesn’t include the following groups, suggest that they be added.

- local elected officials (e.g., mayors and vice-mayors), other department heads, and regional officials;
- national or international level environmental or social justice NGOs;
- Community-based organizations, such as church and school leaders;
- Private sector representative from important, affected business sectors or areas of manufacturing activity, etc.
- Others…? Invite them to consider others, but also then ask them to carefully consider their likely technical or pragmatic contributions as well as their “cost” in terms of coordinating schedules, time and effort, and possible friction or cohesiveness with other members of the core group or major stakeholders.

Broad-based community participation is “good,” but it comes at the “cost” of time. Balance these pros & cons in presenting information to the group, or inviting feedback/input from them.

If time allows, you may decide to ask some follow-on questions that build upon the large list of stakeholders that should be involved in the adaptation process. The point is not to answer these questions, but rather to highlight some important aspects that need to be taken into consideration when thinking about building adaptation into institutions. These questions will be addressed over the course of the module series.
--Given all of these various stakeholders, how would decisions be made?
--How would dissent be handled?
--How might you keep stakeholder groups engaged if decisions did not go their way?
--Who would moderate, handle logistics, and serve as an “honest broker” in the process of climate change adaptation?

**EXAMPLE of implementation from Maumere training:**

The facilitator ran this activity as a plenary, but gave each participant a post-it note (with an adhesive back). The participants then wrote down stakeholders whom they felt should be involved in the steering committee. The facilitator asked the participants to place the notes at a distance (close, or farther) from the circle to represent the level of involvement or participation that this stakeholder should have.
VA= Vulnerability Assessment

**Note to Facilitator:** Your 1st job is to lead participants through the materials and keep them roughly “on-schedule,” allowing for some deviations when conversations continue beyond the allotted time, but aware that this will necessitate getting through other material more quickly later on. Secondly, encourage them to communicate with each other, not through or with you exclusively. Finally, you don’t have to have “all the answers” to every question, but you do have to be willing to research the questions they ask of you or the class and try to get back to them later that day or the next day with additional information addressing the issue they raised. In this sense, the learning is active and in “real time,” not all “pre-baked.”

**Participants roles:** This module series relies on a number of group activities along with discussions among all of the participants. There are important reasons for this. In terms of the mechanics of the module series, these activities are designed to be engaging to the participants and to attract and hold their interest over the course of the week-long module series. Perhaps more importantly, though is the fact that these activities encourage interaction between the participants. This is important beyond the scope of these modules because climate change is a complex problem that will require creative, cooperative solutions. One of the key objectives of this module series is to foster trust and encourage networking among staff from different agencies and across scales, as
well as between government and non-government stakeholders. These networks and connections can then be leveraged to implement climate change adaptation and resilience building measures. Because of this, it is important to remind the participants that they must be polite and open to the ideas of the other participants, and cannot dismiss or disrespect other participants in the course. Rudeness or openly dismissive attitudes will not be tolerated. Should this occur, the facilitator should take the person aside at the earliest opportunity and privately let them know that this behavior is counter-productive to the course and cannot continue. Finally, each participant should try to contribute to the learning experience of the other people at the workshop / course by sharing their ideas, experiences, and insights with the others.

An additional reason is that adaptation for cities is still an evolving “science”, and while there are some resources to draw on, there is not a large literature of best practices available. Part of building capacity and resilience is “learning as you go” and experimentation. With that in mind these modules encourage the participants to work together to try new things. Participants should also be encouraged to continually be thinking about how the information presented in this workshop could be applied to their own home context, to make it “real.”

Lastly, this module series is all about building adaptive capacity in the local context. The participants are the experts not only on local vulnerabilities, but also in terms of identifying opportunities and co-benefits. Therefore their participation is key to developing CCAR solutions.

The points above should be made one at a time. They are fairly self-explanatory. The only point which may not be clear (the 4th one) refers to ideas, thoughts, or “answers” we have developed and incorporated into the Speaker Notes as we put together these course materials. They were generated for two purposes: first, to give the facilitator some “fall-back” ideas or suggestions to make to the course participants in case the conversation within the group bogs down or if they didn’t seem to understand the question or have any ideas on how to address it. It’s meant as a “prompting” device to aid in such situations, but these ideas are “pre-cooked” and should NOT be presented as ‘facts” or as the “right answers.” They are merely our best ideas based on experience elsewhere.

Secondly, we wanted to have some of the “conventional answers” in the Speaker Notes for possible comparisons with the group’s answers after they had generated some on their own. The idea there is to come up with even more and possibly better ideas that could be added to their lists or used to generate a ‘hybrid’ list blending both their list and our ideas. That’s why we used the word “compare” in bullet #4.
Note to Facilitator: Utilize a culturally appropriate method of “breaking the ice” and encouraging the participants to talk a little bit about themselves.

One suggestion: Let’s NOT go around in a circle or in any particular “order.” Surprise them by randomly selecting the next person to share themselves with the group. Make the participants comfortable. Start with yourself first. Keep it interesting and fun, non-threatening. Encourage them to ask each other questions, not just sit around passively while only you and the “active” participant talk.

By now, they have done a group exercise together without knowing who was who; now, they have an opportunity to get to know one another and build trust and comfort based on that experience. If you (or even better yet – one of the other participants) remember what roles they played and can ask them a question or two about why they did something, or said something, then this would be an excellent opportunity to open up the “floodgates of interaction” among them. Remember that the key is to get them to talk to one another, and not only to you as the Facilitator.

Example from Maumere and Manila trainings: In each of these trainings the facilitator asked the participants to describe disaster risk reduction and climate change adaptation efforts already underway in their city. This provides an opportunity for participants to share progress that they have already made, and also helps the facilitator know how familiar the participants are with climate change and how much progress they have made in terms of meeting existing mandates and legal requirements (if they exist).
A key outcome will that you will be able to assess potential climate change threats specific to your city. As noted previously, climate change will have different impacts in different places. It is widely accepted that a key consideration for mobilizing local support for developing CCAR is that the impacts of climate change are understood in the local context. In other words, what does climate change mean for your city? Global warming is a global issue, but climate change is specific to each locality. In developing CCAR strategies it is essential to have detailed information specific to your context. We will discuss how to access information related to impacts in your area. We will also work on techniques for communicating climate change issues in the local context to develop support for CCAR initiatives. This will be accompanied by a deeper understanding of climate change impacts.

We will then apply this understanding of the local “flavor” of climate change threats to identifying how the impacts will be felt in our city. We will develop an understanding of the concepts, tools, and processes of vulnerability and resilience assessments. We’re going to learn how to leverage local resources to develop a detailed understanding of the specific vulnerabilities in your city. This includes figuring out what groups, areas, and assets are most vulnerable to climate change impacts, and why they are vulnerable. Then we’re going to practice a procedure for conducting vulnerability assessments so that you
will be able to conduct your own vulnerability assessments at the end of this module series.

You will find this information to be extremely useful in identifying priority actions for CCAR. These assessments will also help you to identify the “adaptation gaps” in your city, as well as opportunities for developing synergies between climate change adaptation and development goals. So our next step is going to be to develop a list of potential CCAR actions that fit for your city. We’re going to learn how generate options, establish evaluative criteria to compare them, and then apply techniques for choosing between options in a transparent way that builds consensus and trust between stakeholders.

After we develop a list of actual projects and initiatives for increasing resilience in your city, we’re going to learn how to incorporate climate change adaptation and resilience building at the project, agency, and city levels. This is referred to as “mainstreaming”, and is extremely important for sustaining momentum on addressing climate change impacts. CCAR needs to be hardwired into standard operating procedures at the agency and city level, and it needs to be an integral part of sectoral and city development strategies and plans. We’re going to discuss some principles and techniques for mainstreaming, and then we’re going to devise some steps that you can take to start mainstreaming once you’ve finished this module series.

Lastly we’re going to examine the international financial architecture as it relates to climate change. We’ll take some time to understand the funding priorities of the World Bank and other organizations, and we’ll look the evolution of international funding mechanisms and which direction they seem to be going. We’ll learn how to position municipal climate change adaptation and resilience efforts in the national and international contexts so that your efforts can be consistent with the types of things that are likely to attract international support. Then we will learn some strategies for writing funding proposals, and practice those strategies so that you have a good start when you leave this course.
This slide should be considered optional. The facilitator should decide ahead of time if this slide should appear, or if it should be modified. The facilitator should make sure to caution participants about the use of cellular phones in the training venue, and should also remind them of the importance of being on time each morning.

1st Set of Points: These are all self-explanatory, but invite the participants to add any other thoughts they have about the “ground rules” and let them know that they are essentially agreeing to comply with or adopt these rules about behavior during the course / workshop.

2nd Set of Points: These are basic pieces of information that we do NOT have now, but will add once a date and location have been set for training sessions. It’s the last slide we have (besides an open-ended one) in this module before we step into the next module on the Science of Climate Change.

Example from Maumere training:

The facilitator went over these ground rules, and asked the participants if they had any modifications. The participants provided several of their own ground rules. Ask “How would you change these, and what would you add?”
**Common elements of CCAR documents so far…**

- Introduction/Purpose
- Mission and Vision
- Statement of principles
- Key stakeholders
- Baseline conditions in your community

**Note to facilitator:** Here you may include an outline (handout or on the powerpoint) showing the requirements for a climate change adaptation plan in the country where the training is being held (if such requirements exist). You may also provide an example of plan that has already been created in your country. For example, if conducting the training in the Philippines, the Quezon City Local Climate Change Adaptation Plan (LCCAP) is a good example that could potentially be a template. In Indonesia, Semarang, Lampung, Kupang, and Makassar all are good examples. In Vietnam, the Hoi An adaptation plan is another useful example.

This slide provides an overview of the introductory material that should be included in a CCAR-DRR plan. There are all sorts of different adaptation and resilience documents. Some examples are provided in the resource pack. One very important first step is to understand where your adaptation and resilience planning process fits in with the broader administrative and policy framework for your municipality and region. In some areas, the CCAR process is ad-hoc and aims at producing a policy guidance document, often called a CCAR plan. In other places, the CCAR process is mainstreamed into other strategic planning documents and processes.

Like any planning report or blueprint, the CCAR-DRR plan has a general overview of the baseline conditions in the community, as well as a statement of purpose for the document and what it will be used for. Though this module doesn’t focus on actually preparing these parts of the CCAR plan, participants may which to develop an outline so that they can complete the CCAR-DRR plan after the module series.
**Introduction/Purpose.** The introduction of your plan should include information about the objectives of the plan. What is it to be used for? The introduction should also include information about the plan’s intended audience, and its tie in to national laws or legal frameworks (if any exist). Introductions often contain a statement of support from executive leadership of the community (a mayor or bupati), along with the mandate that supports the creation of the CCAR plan.

**Mission/Vision.** This is a concise statement of the purpose of the plan.

**Statement of principles.** This includes principles such as participation, accountability, and transparency. The statement of principles provides general guidance for how the CCAR-DRR plan has been developed, and how it will be implemented. It is important to define the terms that are used here, so that a shared understanding from all stakeholders can developed.

**Key Stakeholders.** This includes a description of the stakeholder groups that are participating in the development of the CCAR-DRR plan, and in what capacity they are contributing.

**Baseline Conditions in your Community.** This includes general geographic, economic, social, and political information about your community. For example, you might include all of the subdistricts or administrative units within your municipality. Other information that is relevant includes

--Physical development of the municipality
--Socio-economic and demographic conditions
--Economic structure
--Strategic development issues and priorities
Here we re-emphasize some of the key points from this module. The first is that adaptation is a local endeavor which makes use of local knowledge and wisdom, provided by a broad range of stakeholders through participatory processes.

A second key point is that building resilience and adaptive capacity should be seen as a part of routine governance, rather than an additional task. In other words, CCAR should be mainstreamed into governance. One very effective method of accomplishing this goal is to identify synergies with other development priorities in your municipality.

A third point is that adaptation is a process, and our understanding of best practices and how to adapt is still developing. Thus if you are present in this room, you are a pioneer. Adaptation and resilience are characteristics of communities, and not goals. They are developed through time, and there is a lot of trial and error. In other words, adaptation and resilience requires a willingness to experiment, and as we shall see in future modules, a willingness to deal with uncertainty. Resilience and adaptation require us to re-examine how we think about governance and the functioning of our city systems. This may seem challenging at first, but in the long run, it will lead to a more resilience population and city.

Lastly, effective resilience and adaptation require us to think beyond sectoral boundaries and instead to see the city as a system. This approach will enable us to develop more effective and comprehensive strategies for addressing the challenges associated with climate change.
Any Other Thoughts?

Do you have any other questions or concerns?
Next: Module 2: Basics of Climate Change!

sampai jumpa lagi kawan...

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