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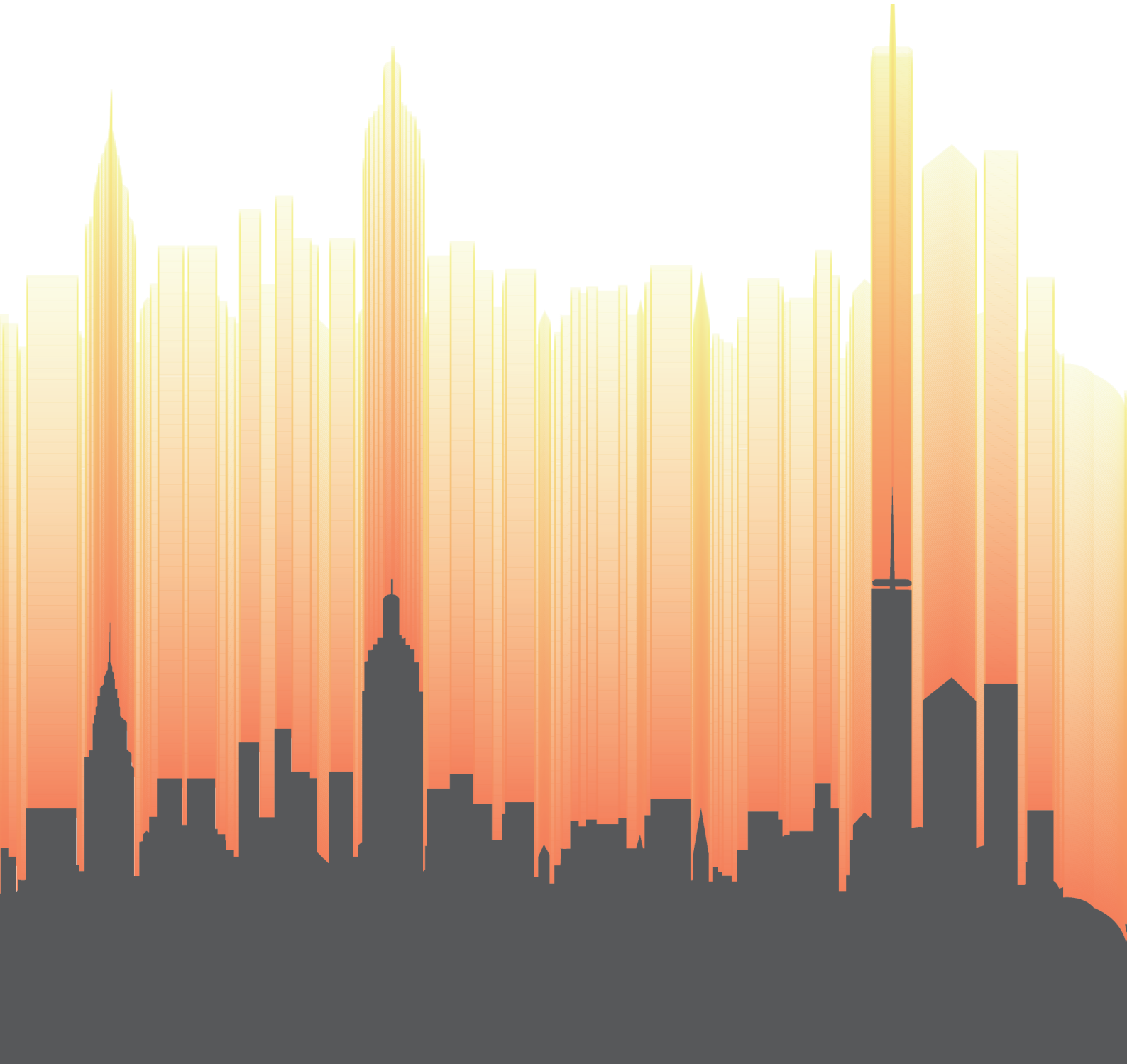
Urban Climate Change Adaptation and Resilience

A Training Manual



URBAN CLIMATE CHANGE ADAPTATION AND RESILIENCE A TRAINING MANUAL

INTRODUCTION

Since 2011, USAID Adapt Asia-Pacific has been helping countries in the region develop climate change adaptation projects and build capacities to access related finance in a sustainable way.

One of the ways USAID Adapt Asia-Pacific does this is by designing and implementing standalone capacity building programs targeted specifically at government officials. These programs focus on priority gaps and issues, such as the economics of climate change adaptation, integrating adaptation into urban governance functions, and climate-proofing infrastructure against climate change impacts. Responding to regional capacity building needs, including a lack of urban-related climate change trainings available, USAID Adapt Asia-Pacific in 2014 developed an Urban Climate Change Adaptation and Resilience (UCCAR) training course. Developed in collaboration with the East-West Center at the University of Hawaii, the course aims to improve climate change knowledge among mid- to senior-level managers working in urban and infrastructure planning and, in turn, help them design better adaptation projects.

This seven-module, five-day course starts with an introduction to climate change and climate change adaptation; provides tools and techniques for assessing climate change impacts and vulnerabilities; presents a framework for identification, evaluation, selection, and implementation of climate adaptation strategies, programs and projects; and finally looks at the options available for financing adaptation projects and methods of accessing climate change finance.

A hallmark of USAID Adapt Asia-Pacific's standalone capacity building programs is to ensure knowledge is tested and applicable in the real world. The UCCAR training course, therefore, incorporates multiple case studies, tools, methodologies, and guidelines developed through USAID Adapt Asia-Pacific's engagement with national and local governments in preparing climate change adaptation projects.

USAID Adapt Asia-Pacific will deliver the UCCAR training through short courses conducted across the Asia-Pacific region, in collaboration with national and local training organizations and institutions of higher learning. These partners will greatly enhance the training by tailoring the course materials to local contexts, providing relevant data sets and case studies, and linking the training with national and local laws, policies, and regulatory requirements for urban climate change adaptation.

This training manual allows the UCCAR training course materials and resources to be freely available to government agencies and practitioners across the region. The manual is primarily targeted at training institutions and agencies looking to develop and deliver urban climate change adaptation project development and finance training. The materials may also be useful for practitioners and individuals working in related sectors looking for a comprehensive set of tools and how-to guides for urban climate change adaptation.

COURSE OBJECTIVES

This course is designed to build adaptive capacity and resilience to the impacts of climate change in urban areas in the Southeast Asia, South Asia, and the Pacific regions. The course is specifically targeted at second- and third-tier cities across these regions, but the material can be customized for other contexts. The course is geared towards both government and non-government stakeholders. The primary objectives of the course are as follows:

- Introduce a systems perspective for thinking about the impacts of climate change on cities;
- Increase general knowledge of global warming and climate change;
- Provide a foundation for understanding direct and indirect impacts of climate change that are locally specific;
- Provide a framework for conducting vulnerability assessments at different scales, ranging from neighborhoods to municipalities;
- Enable participants to generate a portfolio of strategies to systematically address identified vulnerabilities;
- Provide tools and techniques to establish priorities and evaluative criteria to choose between resilience and adaptation options;
- Present a general overview of the process of writing proposals for external grants and loans to finance the implementation of resilience options; and
- Provide an overview of financing options, including locally generated revenue, private sector support, and national and international grants and loans.

OVERVIEW

The course consists of seven modules, which are presented over the course of five consecutive days. In some cases the modules may be interrupted by a weekend. The course can be delivered in English as written or translated and implemented by a local partner. In either case the course should be customized prior to delivery with a "city profile" specific to the site of delivery. The seven modules are described below.

Module 1: An Introduction to Climate Change Resilience

This introductory module covers the structure of the course and general administration issues. The module also discusses the concept of resilience and the need for building adaptive capacity to cope with the impacts of climate change. The module also introduces the systems approach for thinking about urban areas as sites of complex interaction between places, people, institutions, and physical infrastructure. Key learning objectives of this module are as follows:

- Explain why climate adaptation and resilience-building are important;
- Describe climate adaptation in the context of city systems; and
- Identify the objectives and goals of the course.

Module 2: Understanding Climate Change and Local Climate Impacts

This module begins with a general overview of global warming and climate change at the global scale, providing information about the Intergovernmental Panel on Climate Change (IPCC) along with some practical considerations regarding the models and assumptions that are used to develop projections of future climate conditions. The module provides projected impacts for South and Southeast Asia followed by country- and municipality-specific information on impacts. Participants will develop a locally-specific description of the threats associated with a changing climate, as well as a generalized threat profile for their municipality or region. The module concludes with an overview of common first steps in developing climate change resilience strategies. Key learning objectives of this module are as follows:

- Describe the difference between global warming and climate change;
- Identify the major human activities associated with global warming;
- Describe the types of "sudden shocks" and "slow onset" risks of climate change likely to affect urban areas in the Asia-Pacific region;
- Identify possible direct and indirect impacts likely to be associated with climate risks in your area;
- Explain clearly and concisely to policy makers and other stakeholders the potential impacts of climate change in your area; and
- Describe the basic information needed to begin a climate adaptation planning effort.

Module 3: Scoping for Climate Change Adaptation and Resilience (CCAR) and Disaster Risk Reduction (DRR)

This activity-centered module focuses on preparations for conducting a vulnerability assessment. These considerations include establishing a core team for conducting the assessment, deciding upon the scope and geographic scale of the assessment, determining the goals of the assessment, and selecting the tools and methods that will be used to conduct the assessment. Through the activities in this module the participants will develop information that will feed into activities in later modules. Key learning objectives of this module are as follows:

- Describe the components of a CCAR scoping effort;
- Develop an impact chain for a major climate risk in your area;
- Explain how to choose a geographic area for a vulnerability assessment; and
- Describe the contribution of both "top-down" and "bottom-up" methodologies to conduct a vulnerability assessment.

Module 4: Techniques for Vulnerability Assessment and Generating Climate Change Adaptation and Resilience Options

This module begins by discussing the steps for conducting a hybrid vulnerability assessment that includes both qualitative and quantitative methods. A suite of exercises guides participants working in groups through procedures for determining vulnerability through analysis of exposure, sensitivity, impacts, and adaptive capacity. After prioritizing vulnerabilities, the second part of the module discusses how principles of resilience can be used to develop a portfolio of adaptation strategies to address identified vulnerabilities systematically. Working in groups, the participants develop a range of options to address different aspects of the vulnerabilities they identify in the first part of the module. Key learning objectives of this module are as follows:

- Explain how the concepts of exposure, sensitivity, impacts, and adaptive capacity are used in developing a climate change vulnerability assessment;
- Describe procedures for conducting an actual vulnerability assessment for a specific area;
- Describe procedures for setting priorities among community vulnerabilities;
- Contrast conventional "predict/protect" approaches to CCAR and DRR with a resilience-building approach; and
- Identify and explain the key characteristics that can make urban systems more resilient to the impacts of climate change.

Module 5: Evaluating Strategies for Reducing Vulnerability and Mainstreaming Resilience

The first part of this module provides guidance on how to develop evaluative criteria specific to the vulnerabilities and options identified in the fourth module. Working in groups, participants develop a list of evaluative criteria to apply to these options. The second part of the module discusses methods for applying evaluative criteria, emphasizing the importance of multi-stakeholder participation, accountability, and transparency. Methods discussed include processes for group participation in the analysis of alternatives, such as multi-criteria analysis, cost benefit analysis, and Goeller scorecards. Participants use one of these methods to apply the criteria developed in the first part of the module. Key learning objectives of this module are as follows:

- Identify criteria likely to be used in evaluating and setting priorities among climate adaptation strategies;
- Describe techniques that groups of experts, citizens, public officials, and others can use to apply evaluative criteria to assess strategies that have been identified; and
- Identify different types of costs and cost-assessment procedures that may be relevant to the evaluation of urban climate adaptation strategies.

Module 6: Preparing Project Proposals to Access Climate Funds and Support Services

This module helps participants draw on information generated in the vulnerability assessments and strategy formation to develop coherent, bankable proposals for external support in the form of loans or grants. The first part of the module presents the steps for developing a proposal, and includes group activities in which participants develop a problem/objectives tree, a statement of objectives, and a project logical framework. Though based on a World Bank model, the process is generalizable to a wide range of loans and grants from bilateral and multilateral sources. The second part of the module focuses on the priorities of lenders/donors and provides guidance on feasibility, social and environmental safeguards, and other commonly used appraisal criteria. A third section discusses "lessons learned" for effective proposal writing. Key learning objectives of this module are as follows:

- Identify the key components of proposals for financing to support urban climate adaptation initiatives;
- Show how to develop a problem tree, objectives tree, and logical framework (logframe) for a project or program;
- Explain what is meant by "due diligence" for donor appraisal of funding proposals; and
- Demonstrate some "best practices" and lessons learned for developing effective proposals.

Module 7: Accessing Financing for Climate Change Adaptation and Resilience

This customizable module discusses a number of options for financing adaptation programs with the goal of helping participants understand that climate adaptation should be financed by multiple sources, and that each source is appropriate for different types of adaptation and resilience measures. Different sources include the private sector, locally generated funds, national, and international funds. Working in groups, participants develop a financing plan for supporting the options developed in earlier modules. Key learning objectives of this module are as follows:

- Describe different sources for financing climate adaptation and resilience, including international, national, and local sources;
- Explain the basic goals and requirements of international climate adaptation funds;
- Identify appropriate roles the private sector can play in climate adaptation;
- Identify appropriate roles for different levels of government in seeking and using climate adaptation funds; and
- Explain criteria for assessing the climate finance readiness of local governments.

COURSE THEORY AND BACKGROUND NOTES ON CLIMATE CHANGE ADAPTATION AND RESILIENCE

This course is designed to be implemented throughout South Asia, Southeast Asia, and the Pacific. The course is based on an extensive literature review covering climate change impacts, adaptation in urban areas, resilience-building, and the current state of climate finance. The course also draws on experience and expert field knowledge of adaptation efforts throughout the Asia-Pacific region, as well as lessons learned from multinational adaptation projects, including the Rockefeller Foundation-funded Asian Cities Climate Change Resilience Network (ACCCRN). In this section we present some of the key assumptions and findings upon which this course was built.

Adaptation

The Intergovernmental Panel on Climate Change (IPCC) defines climate change adaptation as "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC 2007). This course addresses the need for adaptation at the local level in cities and regions throughout the Asia-Pacific region, as follows:

- Adaptation is necessary because some degree of climate change is inevitable even if current efforts to mitigate greenhouse gas emissions and global warming are successful.
- Though mitigation is normally managed at the national and international levels, adaptation to climate change is best managed at the local level.
- Urban adaptation to climate change is a major global priority since slightly more than half the global population lives in cities, with the urban percentage projected to increase to 70% by 2050. Adaptive capacity building is particularly important in secondary and tertiary cities in the Asia-Pacific region, since more than 60% of the projected increase in the global urban population will take place in Asia, and more than half of that growth will occur in cities with less than half a million people.
- Secondary cities currently face an adaptation gap as they struggle daily to deliver basic infrastructure and services.
- Climate change is creating new conditions for development in poor countries, especially in urban areas in poor countries, by directly affecting living conditions, impacting infrastructure, and impacting critical rural-urban interactions that serve as city support mechanisms.
- Climate change cannot be separated from the other risks people in developing countries face including food security, unstable markets for cash crops, and state failure.
- Current planning, especially for DRR, is based on the principle of stationarity, which assumes that natural systems and conditions fluctuate within an unchanging envelope of variability. Climate change, however, renders this assumptions obsolete. The challenge of dealing with climate change has not been adequately addressed by planning and policy processes.
- Whereas mitigation is generally handled at the national and international level, adaptation is best handled at the local level. With that in mind, there are a number of general deficiencies and needs to address at the local level. These include:
  - » Preparation of detailed adaptation plans and the incorporation of these plans into the development and spatial planning processes for the local government unit *(mainstreaming of adaptation)*;
  - » Intensive training and capacity building programs that help municipal and regional officials understand the issues and impacts associated with climate change and the urgency and importance of developing adaptation measures for the local areas. This includes capacity building on aspects of climate change as well as technical aspects of adaptation and resilience policy and the assessment of vulnerability; and
  - » Identification of local scale impacts of climate change as well as adaptation priorities.

Adaptation as a Local Endeavor

As noted, this course also assumes that local governments are in the best position to coordinate the planning and implementation of adaptation strategies. This requires that local governments understand the challenges associated with climate change and that efforts are made by national and international actors to support local efforts and build local capacity in adaptation planning and implementation, as follows:

- A localized understanding of climate change that emphasizes specific impacts on city systems, including social and economic systems, is critical in mobilizing support for enhancing resilience and adaptive capacity at the municipal/regional level.

- Current approaches to addressing climate-related risks frequently stress short-term approaches biased towards simple technological fixes. Longer-term resilience to climate change impacts and DRR require a systems-oriented approach that considers impacts over multiple timescales.

- We draw from the resilience-building lessons of the Asian Cities Climate Change Resilience Network (ACCCRN) experience in Asia. Three basic components of building resilience are:
  - » Strengthening fragile systems;
  - » Strengthening social agents; and
  - » Strengthening institutions to support the other two.

- Employing principles of resilience enables communities to proactively address potential climate threats in ways that effectively respond to the uncertainties associated with the magnitude of future climate threats.

- Employing the principles of resilience decreases the potential of implementing maladaptive strategies that increase overall system vulnerability in the long run.

- Local governments can play a potentially strong role in coordinating private sector investments in urban systems that incorporate principles of resilience and which enhance adaptive capacity. Institutions, regulations, and enforcement can all send powerful signals to the private sector and contribute to comprehensive resilience-building projects.

- Local governments need an accurate understanding of climate change and resilience financing options, as well as national and international mechanisms for climate finance.

- Local governments have significant untapped capacity to finance some climate change adaptation strategies, especially if these strategies find co-benefits with, and feed into, other local development priorities.

- National and international sources of finance for climate change adaptation are available to local governments, but each fund has its own rules and procedures and the requirements to gain access to finance has the potential to overwhelm low-capacity municipal and regional government units.

The Vulnerability Framework

This course addresses climate change adaptation from the perspective of existing vulnerability, operating on the assumption that effective adaptation begins by addressing existing vulnerabilities, as follows:

- Vulnerability is shaped not only by the nature of threats, but also by local socio-economic, political, and institutional factors.

- Vulnerability assessments should be rooted in, and draw on, local knowledge of the city/region and its systems.

- The vulnerability assessment should encourage broad stakeholder engagement and help local communities to draw on their own experiences to develop and prioritize options for addressing local challenges

Adaptation Strategies and Addressing Vulnerability

This course draws on and builds upon the principles of resilience used by the Asian Cities Climate Change Resilience Network (ACCCRN) initiative. Resilience means addressing systemic vulnerabilities to climate change through a portfolio of strategies developed across sectors, as follows:

- Climate change adaptation strategies should find synergies with existing socio-economic development programs and policies and should harmonize with existing development priorities.

- Climate change adaptation strategies should be multifaceted, addressing systemic vulnerabilities, and should include capacity building, institutional changes, strengthened infrastructure, and ecosystem-based measures. Systemic approaches to addressing urban vulnerability pay heed to the interdependence of infrastructure, institutions, and agents, as well as the indirect impacts of climate change.

- Adaptation strategies should reduce current risks, strengthen adaptive capacity of the poor, and address the causes of vulnerability among marginalized groups.

- Adaptation to climate threats should be an iterative process, refined over time in response to new information and experience.

- Increasing adaptive capacity and resilience to climate change impacts should be a co-creative process involving a wide range of stakeholders.

- There are numerous ways to decrease vulnerability to climate change. Adopting a resilience-oriented approach will enable city governments and other stakeholders to identify multiple pathways for increasing adaptive capacity. In many cases, the conventional "predict and prevent" approaches, which include armoring coastlines and waterways, may be less cost-effective than other strategies that strengthen institutions or enable the adaptive capacity of individual actors. In other cases, the effectiveness of predict and prevent approaches can be enhanced if developed as part of an overall adaptation portfolio that addresses systemic vulnerabilities.

- Approaches to decreasing vulnerability include efforts to reduce exposure and sensitivity to risk and to increase adaptive capacity. Ideally, an adaptation portfolio for a city or region will include all of these.

- Increasing adaptive capacity is one area where municipal governments and other stakeholders have a great deal of influence. It is also an area where potential co-benefits with other development goals can often be identified. For example, adaptive capacity tends to be lower for more marginalized groups and poorer people.

- Increased adaptive capacity often results from improvements in governance and can contribute to improved livelihoods in the city or region. Examples of increased adaptive capacity include:
  - » Improved availability and access to economic resources;
  - » Improved availability and access to technology;
  - » Greater equity in the allocation of power and access to resources and services;
  - » Improvements in the structure and organization of critical institutions and greater participation and representation in decision-making processes;
  - » Improved skills and human capital; and
  - » Improved social cohesion and greater social capital.

LOCALIZING THE PRESENTATIONS/ BEFORE THE WORKSHOP PREPARATIONS

This section explains points in the training where the local implementer should prepare/modify the materials before the training begins.

Please note that the PowerPoint presentations were developed on Windows computers. If you are using an Apple computer to display the presentations, some re-formatting may be required.

Module 1

Slide 4: What is the purpose of this course?
For this slide you should acquaint yourself with the legal and institutional framework for climate change adaptation in the country and region where the course is being implemented. Be prepared to describe any national regulations that have been enacted which require local governments to develop CCA plans or to mainstream CCA into existing processes of government. Also be aware of any national/municipal declarations on climate change adaptation.

Slide 11: Let's Prepare for our New Climate
This slide features a video resource. The resource can easily be downloaded with subtitles in a number of languages, including Chinese, Indonesian, and Vietnamese. Before making the presentation, download the version with subtitles appropriate for your location and embed the video into the PowerPoint presentation.

Slide 24: Ground Rules and Logistics
Customize this slide with any rules and logistical considerations that are locally relevant.

Module 2

Module 2 requires the greatest amount of localization. Material to add to this module includes the following:

- National and subnational projections of future climate variables (where available);
- Information about locally-relevant downscaling projects and where to obtain; downscaled projections (if available);
- Video resources in the local language demonstrating impacts and urgency of climate change;
- Expected climate change impacts at the national and local level; and
- Examples of partnerships between municipalities/ regions and academic institutions.

Module 3

Module 3 discusses scoping (logistical and methodological) considerations for conducting a vulnerability assessment. If there are established practices for conducting vulnerability assessments in the country where the training is being conducted, include those.

Module 4

The first part of module 4 is about vulnerability assessments. This module currently has numerous examples of exposure, sensitivity, impacts, adaptive capacity, and vulnerability, but additional in-country examples demonstrating how vulnerability assessments have been conducted in the country where the training is being conducted will further enhance the presentation. Potential slides to add based on local examples would include:

- Examples of exposure maps/checklists;
- Examples of proxies for sensitivity/adaptive capacity;
- Maps of local impacts;
- Scoring keys or metrics from local vulnerability assessments; and
- Results from local vulnerability assessments.

Module 5

Module 5 requires relatively little modification; however, if there are established or mandated methods for developing and applying evaluative criteria in the country of delivery these should be included. The trainer may also choose to replace one of the included case studies (Jakarta flooding or Hawaii beach erosion) with a local case or one more familiar to your participants.

Module 5 also includes a section on "mainstreaming" climate change adaptation into local processes of governance. In the pilot testing phase the section on mainstreaming was omitted, and as the course content was being revised much of the conceptual material from the mainstreaming section was incorporated into other sections of the training. The material has been left in module 5 for reference and to give local implementers the option of including the material. If you choose to include the material, the allotted time for module 5 should be increased by two to three hours.

Module 6

Module 6 is concerned with developing proposals for financing the implementation of climate change adaptation options. The material in the module focuses on international-level proposals and is based on information from USAID, the World Bank, and other bilateral and multilateral institutions. However, in both pilot testings the material was localized to address skills the local implementing partner identified as important to the local context. In addition, although there are case study materials that have been provided (the Valenzuela City materials), in all cases of implementation, the local facilitators have relied on locally-generated examples and applied the activities in module 6 to information that comes from the participants themselves.

Another modification to make module 6 more locally relevant would be to include information about national-level climate adaptation or resilience funds and the application procedures for these funds.

Module 7

Module 7 contains a great deal of material; more than can be discussed in the allotted time of three to four hours. Some of the material in the module will likely not be relevant in the country where you are presenting the training. For example, in the Philippines there is no way for local governments to access the Adaptation Fund, which is discussed in the module. Another example is that in Indonesia, local governments are not able to issue bonds (in the vast majority of cases) or to secure loans from international lenders. In these cases the facilitator should remove the material that is irrelevant to the site of implementation. Moreover, different countries may have different climate finance mechanisms and procedures. Thus the local facilitation partner should include information related to climate financing that is specific to the local context.

Slide 2: Last Time We Discussed

Make sure the bullet points accurately describe what was covered in module 6.

Slide 16: Contingency Lines-of-Credit

If the host country has a national or regional "rainy day fund", or funds that are available in case of crisis, disaster, or other emergency situation, include a description of that fund in this slide.

Slide 33-38: Description of Climate Investment Funds

This is a general discussion of several funds under the umbrella of the Climate Investment Funds (CIFs), including the Clean Technology Fund and the Strategic Climate Fund. Before presenting this module, identify examples of projects funded by the Pilot Program for Climate Resilience (PPCR), Scaling-Up Renewable Energy Program (SREP) and the Forest Investment Program (FIP) in the host country (if they exist) and provide details. Some participants may be familiar with these programs already.

Estimated Time Required for Each Module

The actual time for each module will vary with each implementation, depending upon modifications made by the local facilitation partner. The overall time required for all of the modules is five days. The following list represents estimated time for each module as the course has been designed.

Module 1: 3 hours (one half day; to be presented on the first day)

Module 2: 3-4 hours (one half day; to be presented on the first day)

Module 3: 3-5 hours (one half day; to be presented on the second day)

Module 4: 10-12 hours (1.5 days; to be presented on the second and third days)

Module 5: 3-5 hours (one half day; to be presented on the fourth day)

Module 6: 8 hours (one full day; to be presented on the fourth and fifth days)

Module 7: 3-4 hours (one half day; to be presented on the afternoon of the fifth day).

LIST OF MATERIALS/FACILITIES NEEDED FOR COURSE IMPLEMENTATION

Facility

The facility chosen for the training should be accessible to disabled participant and should be climate controlled with easy access to restrooms and marked evacuation routes. The facility should also have ample space for the trainer to circulate among participants, and should have walls or posting boards that will allow participants to hang butcher-paper diagrams for analysis and discussion. The ideal facility will be buffered against outside noise, with appropriate acoustical characteristics for the use of a public address system.

The facility should have wireless internet access.

Seating Arrangement

The format of the entire training alternates between plenary session, facilitator-led discussion and participant-oriented group activities. Participants will need enough table space to take notes and conduct butcher-paper work. Participants will also need to be able to watch the facilitator and view the LCD projector without discomfort. We recommend arranging participants in groups of four to six for the duration of the training. Since the training is stretched over five full days, we recommend that comfortable seats are provided.

Materials/Equipment Required

The following materials/equipment should be prepared ahead of time:

- LCD projector with 10 m VGA cable and Apple adapter. Ideally a backup projector and VGA cable will be arranged as well;
- Flipchart (used to facilitate discussion) and several colored markers, and additional flipcharts/butcher paper and markers for participant groups;
- Laser pointer/slide advancing controller;
- Public address system with three wireless microphones; and
- Cables/adapters to connection computer to public address or external speaker system.

The following course materials will be needed:

- Pre-test/post-test questions;
- Sign-in sheets for each session;
- Course worksheet printouts;
- Course evaluation forms;
- Printed copies of slides (optional); and
- CD-ROMs with PDFs of course slides and reference documents.

PRE- AND POST-TEST QUESTIONS

This section contains a number of questions that can be included in pre-/post-training assessments. We recommend using at least 20 questions for both the pre- and post-test. You may choose to use the same questions for the pre- and post-test.

Pre-Test

1. "Mitigation" refers to efforts to decrease greenhouse gas emissions thereby addressing the root cause of climate change.
    A. True
    B. False

2. "Adaptation" refers to
    A. Efforts to decrease greenhouse gas emissions
    B. Strategies and interventions aimed at dealing with the impacts of climate change
    C. Multilateral efforts to develop and implement a carbon trading mechanism
    D. None of these

3. Adaptation to climate change impacts is most appropriately implemented at the local level.
    A. True
    B. False

4. Most future population growth will occur:
    A. In cities in Europe
    B. In rural areas in Asia
    C. In cities in Asia
    D. In cities in Latin America

5. Over the past few decades,
    A. Geophysical disasters have increased, whereas hydrometeorological disasters have remained relatively constant
    B. Both geophysical and hydrometeorological disasters have increased significantly
    C. Both geophysical and hydrometeorological disasters have declined slightly
    D. Geophysical disasters have remained relatively constant, whereas hydrometeorological disasters have increased

6. The Intergovernmental Panel on Climate Change (IPCC):
    A. Is open to all members of the United Nations
    B. Produces Assessment Reports that synthesize research on climate change
    C. Works to provide policy relevant, unbiased information
    D. All of these

7. The effects of climate change vary from place to place within (insert country).
    A. True
    B. False

8. (Insert country) faces which of the following climate impacts?
    A. Increased drought
    B. Increased flooding
    C. Higher temperatures
    D. All of the above

9. What of the following best describes the difference between mitigation and adaptation?
    A. Adaptation reduces greenhouse gas emissions, mitigation increases resilience
    B. Mitigation is most effective at the local level; adaptation at the international level
    C. Adaptation increases resilience to climate impacts; mitigation reduces greenhouse gas emissions
    D. Both of these words are the same

10. Which of the following is an example of a possible indirect impact resulting from climate change?
    A. Increased coastal erosion due to sea-level rise
    B. Civil unrest due to higher food prices caused by decreased food production
    C. More wind damage from climate change-enhanced tropical storms
    D. Increased wet season flooding due to higher rainfall totals

11. Which of the following is true of Global Climate Models (GCM)?
    A. GCMs provide only course-scale projections and require downscaling for maximum relevance at the municipal/regional scale
    B. Some GCMs are more effective in areas with seasonal monsoons
    C. GCMs are used to provide a general idea of possible future conditions under different emissions scenarios
    D. All of these are true

12. A measure of the extent to which people, places, and things or assets are subjected to potential threats or existing hazards is:
    A. Exposure
    B. Vulnerability
    C. Sensitivity
    D. Adaptive Capacity

13. Which of the following stakeholders should be involved in assessing vulnerability?
    A. Non-government organizations
    B. Local government agencies
    C. Community groups
    D. All of the above

14. In vulnerability assessments, assessing exposure refers to which of the following?
    A. Measuring greenhouse gases
    B. Recording changes in temperature
    C. Identifying people, places, and things affected by climate threats
    D. Determining adaptive capacity

15. Which of the following is an aspect of Adaptive Capacity?
    A. Economic wealth
    B. Access to technology
    C. Infrastructure
    D. All of these are aspects of adaptive capacity

16. Cascading events can occur when a severe impact on one system (e.g. drainage) makes other urban systems more vulnerable to partial or total failure.
    A. True
    B. False

17. Which of the following is NOT a potential source of climate adaptation funding?
    A. Private sector
    B. Charitable contributions
    C. Donor agencies
    D. Local budgets

18. Most climate adaptation financing will be provided by multilateral lending institutions, such as the World Bank.
    A. True
    B. False

19. Armored coastlines are an example of what principle of resilience?
    A. Safe failure
    B. Robustness
    C. Modularity
    D. Redundancy

20. Which of the following is the first step in developing a project proposal?
    A. Logical framework (logframe)
    B. Developing a problem tree
    C. Defining a budget
    D. Identifying safeguards

21. Natural systems assets include which of the following?
    A. Mangrove forests protecting coastal cities
    B. Natural waterways in towns and cities to handle runoff
    C. Upland forests and natural areas in watersheds that facilitate infiltration and water storage
    D. Vegetation on steep hillsides and slopes
    E. All of the above

22. Focusing on projects [e.g. flood dikes] is a more efficient and effective than improving urban systems as a way to address the long-term effects of climate change.
    A. True
    B. False

23. Which of the following is <u>not</u> a key element of urban resilience?
    A. Urban agents and their skills and knowledge
    B. Institutions that structure human behavior
    C. Urban systems such as transportation and waste management
    D. Adaptive capacity
    E. Global climate models

24. Which of the following is <u>not</u> a resilience principle?
    A. Robustness
    B. Redundancy and modularity
    C. Creativity
    D. Flexibility
    E. Responsiveness

25. Which of the following is the best definition of the concept of institutions in developing urban resilience programs?
    A. Government agencies dealing with climate change adaptation such as urban planning
    B. Organizational networks addressing climate adaptation
    C. Social rules or conventions [including laws] that structure human behavior such as laws and norms governing property rights or group decision-making
    D. Climate adaptation plans and programs coordinating government activities

26. Which of the following is not an example of maladaptation?
    A. Climate plans or programs disproportionately affect the most vulnerable
    B. Incentives to adapt are reduced
    C. Creating "path dependency"
    D. Increase greenhouse gases
    E. Increasing taxes to pay for climate adaptation initiatives

27. A financial mechanism designed to ensure quick access to loans in times of crisis, or to fill gaps while other resources are being mobilized is:
    A. A green bond
    B. A contingency line of credit
    C. Reinsurance
    D. Capital investment planning
    E. A user fee

28. All of the following are part of the Climate Investment Funds (CIF) system except:
    A. Pilot Program for Climate Resilience (PPCR)
    B. Scaling-Up Renewable Energy Program (SREP)
    C. Forest Investment Program (FIP)
    D. Clean Technology Fund (CTF)
    E. Adaptation Fund (AF)

29. The ability of stakeholders and the general public to freely examine processes of decision-making by public officials is referred to as:
    A. Accountability
    B. Participation
    C. Transparency
    D. Opacity
    E. Resilience

30. "Representative Concentration Pathways" (RCPs) are:
    A. Climate finance funds established by the UNFCCC COP
    B. Global Climate Models used for projecting future climate
    C. Regional climate adaptation fora in Asia
    D. Scenarios of future GHG emissions used by the IPCC to project future climate

31. Which of the following is not true of global warming?
    A. Most climate scientists agree that global temperatures are increasing, but doubt that humans have any influence over this process
    B. Over the past 100 years, global temperature has increase by about 1° Celsius
    C. Every decade since the 1970s has been warmer than its predecessor
    D. Global warming is driven primary by increased concentrations of greenhouse gases in the atmosphere

32. Which geographic area is currently experiencing the greatest increase in GHG emissions?
    A. North America
    B. Europe
    C. Asia
    D. Africa
    E. South America

33. Which of the following would likely be a result of an increase of 3°-4° in global temperatures?
    A. Major species extinctions
    B. Billions suffering from water scarcity
    C. A decline in global food production
    D. 20% of the global population would be susceptible to flooding
    E. All of these

34. All of the following can be considered "inputs" into the city system except:
    A. Sprawl
    B. Food
    C. Water
    D. Energy
    E. Migrants

35. "The degree to which a system is affected, either adversely or beneficially, by climate change" is:
    A. Resilience
    B. Sensitivity
    C. Exposure
    D. Vulnerability
    E. Adaptive Capacity

36. Building a seawall is an example of an attempt to decrease vulnerability by:
    A. Decreasing exposure
    B. Increasing adaptive capacity
    C. Decreasing sensitivity
    D. Increasing sensitivity
    E. None of these

37. Impact is often described as:
    A. The product of exposure and sensitivity
    B. The result of vulnerability
    C. The product of adaptive capacity and exposure
    D. A principle of resilience
    E. None of these

38. Which of the following are aspects of adaptive capacity?
    A. Social capital
    B. Economic wealth
    C. Access to technologies
    D. All of these
    E. None of these

39. Measures individuals and households take to increase resilience are referred to as:
    A. Collective Adaptive Capacity
    B. Institutional Adaptive Capacity
    C. Autonomous Adaptive Capacity
    D. Secondary resilience
    E. Holistic Adaptive Capacity

40. "The ability of a social or ecological system to absorb disturbances while retaining the same structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change" is:
    A. Robustness
    B. Adaptive Capacity
    C. Vulnerability
    D. Flexibility
    E. Resilience

41. A "dead man's switch" on a train, and a pressure release valve are both examples of what characteristic of resilient systems?
    A. Robustness
    B. Safe failure
    C. Flexibility
    D. Adaptive Capacity
    E. Redundancy

42. Actions that reinforce negative climate change impacts in the long term, either directly or indirectly, are referred to as:
    A. Vulnerability
    B. Maladaptation
    C. Exposure
    D. Transparency
    E. Weaknesses

43. Which of the following is a commonly used evaluative criteria for judging options?
    A. Effectiveness
    B. Feasibility
    C. Co-benefits
    D. All of these
    E. None of these

44. A Goeller Scorecard is used for which of the following?
    A. Assessing vulnerability
    B. Applying for project financing
    C. Determining sensitivity
    D. Community mapping
    E. Applying evaluative criteria

45. The process of integrating climate change concerns and considerations into normal, regular local planning, programming, and other governance processes is:
    A. Vulnerability
    B. Institutionalization
    C. Mainstreaming
    D. Exposure
    E. Participation

46. A logical framework (logframe) includes all of the following except:
    A. Outputs
    B. Budget
    C. Inputs
    D. Outcomes
    E. Activities

47. Which of the following is not a component of a funder/lender due diligence appraisal?
    A. Technical and managerial feasibility
    B. Economic and financial analyses
    C. Vulnerability assessment
    D. Environmental and social safeguards
    E. All of these are part of a due diligence appraisal

48. Because of increased sophistication, global climate models are now able to predict future climate conditions in municipalities with a high level of detail and accuracy.
    A. True
    B. False

49. Which of the following criteria are used to rate the credit worthiness of local government units?
    A. State of municipal finances
    B. Orientation towards financial reform
    C. Managerial capability
    D. Legal and administrative framework
    E. All of these

50. National level adaptation responsibilities include all of the following except:
    A. Coordinating national climate change policy
    B. Facilitating and supporting capacity building at lower scales
    C. Gathering and analyzing meteorological and climatological data
    D. Conducting vulnerability assessments
    E. Acting as an intermediary between subnational levels of government and the international community

Pre-Test Answers

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Pre-Test Score

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Post-Test Score

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PRE- AND POST-TEST ANSWERS

1. A. True
2. B. Strategies and interventions aimed at dealing with the impacts of climate change
3. A. True
4. C. In cities in Asia
5. D. Geophysical disasters have remained relatively constant, whereas hydrometeorological disasters have increased.
6. D. All of these
7. A. True
8. D. All of the above
9. C. Adaptation increases resilience to climate impacts; mitigation reduces greenhouse gas emissions
10. B. Civil unrest due to higher food prices caused by decreased food production
11. D. All of these are true
12. A. Exposure
13. D. All of the above
14. C. Identifying people, places, and things affected by climate threats
15. D. All of these are aspects of adaptive capacity
16. A. True
17. B. Charitable contributions
18. B. False
19. B. Robustness
20. B. Developing a problem tree
21. E. All of the above
22. B. False
23. E. Global climate models
24. C. Creativity
25. C. Social rules or conventions [including laws] that structure human behavior such as laws and norms governing property rights or group decision-making
26. E. Increasing taxes to pay for climate adaptation initiatives
27. B. A contingency line of credit
28. E. Adaptation Fund (AF)
29. C. Transparency
30. D. Scenarios of future GHG emissions used by the IPCC to project future climate
31. A. Most climate scientists agree that global temperatures are increasing, but doubt that human have any influence over this process
32. C. Asia
33. E. All of these
34. A. Sprawl
35. B. Sensitivity
36. C. Decreasing sensitivity
37. A. The product of exposure and sensitivity
38. D. All of these
39. C. Autonomous Adaptive Capacity
40. E. Resilience
41. B. Safe failure
42. B. Maladaptation
43. D. All of these
44. E. Applying evaluative criteria
45. C. Mainstreaming
46. B. Budget
47. C. Vulnerability assessment
48. B. False
49. E. All of these
50. D. Conducting vulnerability assessments

CLIMATE CHANGE ADAPTATION AND RESILIENCE BIBLIOGRAPHY AND COURSE REFERENCES

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ADDITIONAL RESOURCES FOR CLIMATE CHANGE ADAPTATION AND RESILIENCE

The following is a list of guides, policy documents, and other materials referred to in the course. The materials are listed in order of their appearance in the course. These materials should be included along with other course materials in a resources CD-ROM/flash drive/disk image at the end of the training.

Module 1

UNEP. 2014. The Adaptation Gap: A Preliminary Assessment. 88 pp.
Download at: http://www.unep.org/climatechange/adaptation/gapreport2014/portals/50270/pdf/AGR_FULL_REPORT.pdf

USAID. 2014. Local Systems: A Framework for Supporting Sustained Development
Download at: http://www.usaid.gov/sites/default/files/documents/1870/LocalSystemsFramework.pdf

IPCC. 2013. Fifth Assessment Report Glossary of Terms
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Download at: http://www.unisdr.org/files/26462_handbookfinalonlineversion.pdf

Module 2

IPCC. 2013. Fifth Assessment Report Summary for Policy Makers.
Download at: wg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf

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Module 3

USAID. 2013. Dominican Republic Climate Change Vulnerability Assessment Report.
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Module 4

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Module 5

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Module 6

USAID. 2010. Performance Monitoring and Evaluation Tips: Building a Results Framework. 2nd Edition. 11 pp.
Download at: https://www.ndi.org/files/Performance%20Monitoring%20and%20Evaluation%20Tips%20Building%20a%20Results%20Framework.pdf

Wood, Lynnette. 2015. Compendium of Lessons Learned from ARCC Climate Change Vulnerability Assessments. USAID. 138 pp.
Download at: http://community.eldis.org/.5b9bfce3/Integrated%20ARCC%20Compendium_CLEARED.pdf

Module 7

Kaganova, Olga. 2011. Guidebook on Capital Investment Planning for Local Governments. World Bank. 102 pp.
Download at: http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1169585750379/UDS13CIP.pdf

Beaurain, Francois, and Guido Schmidt-Traub. 2010. Developing CDM Programmes of Activities: A Guidebook. CDC Climat. 73 pp.
Download at: http://cpf.wbcarbonfinance.org/system/files/PoA_Guidebook_SouthPole.pdf

Climate Focus. 2011. The Handbook of Programmes of Activities: Practical Guidance to Successful Implementation. 77 pp.
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KfW Bankengruppe. 2009. PoA Blueprint Book: Guidebook for PoA Coordinators Under CDM/JI. 116 pp.
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Hinostroza, Miriam, Alfredo Lescano, Jorge Alvarez, and Francisco Avendano. 2009. A Primer on CDM Programme of Activities. UNEP. 64 pp.
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World Bank. 2010. Climate Risks and Adaptation in Asian Coastal Megacities: A Synthesis Report. 97 pp.
Download at: http://siteresources.worldbank.org/EASTASIAPACIFICEXT/Resources/226300-1287600424406/coastal_megacities_fullreport.pdf

World Bank. Adapting to Climate Change: Assessing the World Bank Group Experience, Part III. 150 pp.
Download at: http://ieg.worldbankgroup.org/Data/reports/cc3_full_eval_0.pdf

Hoornweg, Daniel, and Mila Freire. 2013. Building Sustainability in an Urbanizing World: A Partnership Report. 197 pp.
Download at: http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1169585750379/UDS17-Partnership-Paper.pdf

LINKS TO VIDEO RESOURCES

The following is a list of videos used in the course along with links to the videos online. In some cases the videos are already embedded in the PowerPoint presentations; in other cases you will need to embed or navigate to the videos using a web browser. The local facilitation team should also feel free to customize the modules with additional video resources more targeted towards local audiences.

Module 1

"Let's Prepare for Our New Climate". Segment of TED Talk by Vicki Arroyo in English with subtitles available in many languages. 10m35s.
http://www.ted.com/talks/vicki_arroyo_let_s_prepare_for_our_new_climate#t-35369

Module 2

"Climate Change 2013: The Physical Science Basis". Video produced by IPCC describing the Fifth Assessment Report (AR5). 9m20s
http://www.youtube.com/watch?v=6yiTZm0y1YA

"CO2 and the Greenhouse Effect". Video produced by the Pacific Institute for Climate Solutions. 8m06s
https://www.youtube.com/watch?v=sJ0eN_93I4k&list=LLdgzvr3CHxhFriwC7RURpSw&feature=c4-overview

"Projecting Future Climate". Video produced by the Pacific Institute for Climate Solutions. 11m55s
https://www.youtube.com/watch?v=dS4ft5QTyxA&list=LLdgzvr3CHxhFriwC7RURpSw&feature=c4-overview

Module 3

"Climate Change in Jakarta". Video produced by the World Bank. Indonesian with English subtitles. 11m32s
https://www.youtube.com/watch?v=IMv-cPpKjho

Module 4

"Flood Lines—Urban Adaptation in Hoi An, Vietnam". Video produced by UNHabitat. Vietnamese with English subtitles. 13m56s.
https://www.youtube.com/watch?v=BHhJ6HJ8ReA

Module 7

"Financing Action on Climate Change". Video produced by the Organization for Economic Cooperation and Development. Video in English only. 3m2s.
https://www.youtube.com/watch?v=jIfYk911RXc

USAID Adapt Asia-Pacific

CLIMATE CHANGE ADAPTATION PROJECT PREPARATION FACILITY FOR ASIA AND THE PACIFIC

The USAID Adapt Asia-Pacific project (2011-2016) is designed to help countries in Asia and the Pacific obtain financing to address climate change impacts, through a combination of technical support in project preparation, providing relevant training and developing specialized materials to build national and regional capacity for accessing finance.

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