

About the Primer

Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters is a tool for local governments to actively engage in the training, capacity building, and capital investment programs that are identified as priorities for building sustainable, resilient communities.

THE PRIMER APPROACH

The Primer uses a dual track approach to dealing with climate change impacts and disaster risk management issues. One track is to lower GHG emissions through *mitigation* (climate change management) programs of energy efficiency, the use of non-fossil fuels, controlling urban sprawl, improved public transport, recycling wastes and water reclamation. The other track addresses, through *adaptation* programs, the consequences of climate change and the increased frequency and intensity of extreme events and disasters that climate change is creating. These programs are intended to minimize the impact of conditions and disasters caused by climate change.

This Primer is a tool for initiating a dialogue with city officials in East Asia on how their cities can grow to become more resilient. The Primer has been prepared to inform local officials about climate change and to engage them in a city assessment and participatory approach for identifying and addressing key climate change impact issues and possible solutions. It recommends a supportive institutional and policy environment at the state and national levels to enable local adaptation.

The Primer is a motivating step intended to move communities through a process that leads to action and investments. Actions require human, technical, and financial resources for investing in adaptation, preparedness, and mitigation. The Primer introduces change through useful near-term to long-term activities. Initiating informed strategies with less complex near-term actions builds credibility for the local government and confidence to take on more complex mid- to long-term programs in response to climate change.



▲ *Aerial view of Banda Aceh prior to the 2004 tsunami.*

The Primer presents information in a style, tone, and depth that can be used by local governments to share with constituents. Awareness campaigns are important to explain the potential impacts and create a consensus on what may transpire, what and who might be affected, and what therefore can and needs to be done. The Primer emphasizes that the link between climate change and disaster risk management can make better use of citizen groups and volunteerism. This is happening in cities already. The concepts of climate change are simple if explained well, even though the science is complex. Therefore, it is recommended that local governments be organized to confront projected scenarios and create partnerships with centers of excellence to investigate climate change and its impacts to augment their capacity to prioritize and plan.

The Primer presents illustrative examples of mitigation and adaptation sound practices that have already been implemented in urban areas in East Asia and around the world. The leadership decisions are about establishing and exercising good local government resource management practices to create and sustain resilient communities through “no-regrets” policies. The strategies, plans, and activities presented as examples in Section 05 are the cornerstones for good urban management, including having the authority to raise the resources necessary to carry out city priorities financed through maturing domestic capital markets. Local government financial independence is an important key to its resilience.

The Primer emphasizes that the mutual ability of cities to learn is enhanced by their ability to exchange experiences. Local government associations are key tools that provide a platform for cities to come together and exchange their experiences. An important component of any association agenda would feature climate change impacts and disaster risk management as areas in need of and worthy of further attention.



THE PRIMER USER

The Primer is organized as a knowledge resource and process to engage government officials actively in educating themselves and their fellow citizens about the causes and effects resulting from climate change impacts and hazards. Once government officials have identified potential climate change impacts and hazard management issues that could directly affect their constituencies, they will be better prepared for structuring local government operations and developing and implementing actions that mitigate and adapt to the problems. The Primer can be used by any stakeholder—city leaders, civil society, city managers.

The Primer aims to help users answer these questions:

- How does climate change contribute to urban vulnerabilities?
- What are the threats of climate change and natural hazards to city activities and population?
- What is being done by city governments in East Asia and around the world to actively engage in learning, capacity building, and capital investment programs for building sustainable, resilient communities?

The information collection and city assessment activities in the Primer will help cities identify their vulnerabilities to potential climate change impacts and their level of preparedness to climate change and natural hazard risk management. A step-by-step city assessment will challenge policymakers to seriously think about their city resources and the potential effects of an unexpected disaster.

▲ *Aerial view of Banda Aceh destruction after the 2004 tsunami.*

THE PRIMER ORGANIZATION

Users can follow the order of the Primer's contents or move about to focus on particular sections of interest or need. The Primer is divided into six sections followed by substantial supporting resource material:

Section 01/ Understanding the Impacts of Climate Change and Disaster Risk Management

is an introduction to climate change and disaster risk management, explained in context with the objectives of the Primer.

Section 02/ Explaining Climate Change Impacts and Disaster Risk Management. The concepts and consequences of climate change and disaster risk management are presented to illustrate the impact on cities and what cities can and are doing about it. The dual track approach is explained with examples of mitigation and adaptation programs associated with sea-level rise, temperature, precipitation, and extreme events. And the concept of resilience is discussed in understanding the vulnerability of urban areas.

Section 03/ Assessment Exercise: Discovery of a "Hot Spot." Local governments and their stakeholders are presented with a tool for assessing vulnerabilities. Identifying unique built environment and social characteristics, organizational structure, and skills sets is the first step for a city to deal with the ever-increasing responsibilities of decentralization. For effective disaster risk management, the assessment looks at the city's organizational structure and management tools for proactive and reactive responses to natural hazards. The assessment leads to determining priorities of actions to move a city away from becoming a "Hot Spot." This totality of knowledge about the city's vulnerabilities and strengths becomes a critical part of the city's information base and planning process.

Section 04/ Information Exercise: Creating a City Information Base. This section takes the user through the steps of creating a City Information Base with all its resources consolidated into a single document, a Climate Change Impacts and Disaster Risk Management Workbook. The Workbook becomes a repository of information that is updated over time. The Workbook provides an opportunity for participation of many government departments, civil society, NGOs, support groups, private sector, and other stakeholders. The City Information Base is critical to developing, implementing, evaluating, and recording plans and programs to address current and future risks.

Section 05/ Sound Practice Examples of Adaptation and Mitigation presents a set of illustrative sound practice examples of adaptation and mitigation that are being implemented in select cities around the world. The sound practices are organized by area of concern to facilitate learning and discussion. Each city experience is fully discussed in the accompanying CD-ROM.

Section 06/ Conclusions gives a concluding wrap-up to the discussions in the Primer and promotes the startup and continuation of steps to becoming a resilient city. The Primer is just a tool that can be utilized to its fullest degree or in parts. After a city completes the recommended exercises, the Primer continues to offer many resources to help guide a city as it develops its strategy for resilience against the impacts of climate change and risks from disasters.

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The Primer Annexes and other supporting material provide more background resources to delve further into the issues and actions when answering the question “What else do I want and need to know?”

- ***Annex A: Worldwide Programs and Organizations on Climate Change and Hazards***
- ***Annex B: Sources of Technical and Financial Assistance***
- ***Annex C: Examples of Relevant World Bank Projects***
- ***Annex D: Resource Guide***
- ***City Profiles of Sound Practice*** (on accompanying CD-ROM) fully discusses the programs in selected cities that have demonstrated sound practice. The Profiles are a reference to actions identified and discussed in the “Hot Spot” assessments and in preparing the City Information Base. The City Profiles show the cross-sectoral nature of city initiatives to reduce emissions and adapt to changing conditions.



Acronyms and Abbreviations

3C	command, control, and communication
ABI	Association of British Insurers
ADPC	Asian Disaster Preparedness Centre
APEC	Asian-Pacific Economic Cooperation
ASMC	ASEAN Specialized Meteorological Centre
ASEAN	Association of Southeast Asian Nations
BCA	Building Construction Authority (Singapore)
BCPR	Bureau for Crisis Response and Recovery (UNDP)
C	Celsius
CCI	Clinton Climate Initiative
CCSFC	Central Committee for Storm and Flood Control (Hanoi, Vietnam)
CDM	Clean Development Mechanism (Kyoto Protocol)
CER	Certified Emission Reduction
CERT	Community Emergency Response Team (Albuquerque, USA)
CFCs	Chlorofluorocarbons
CH₄	Methane
CIG	Climate Impacts Group (University of Washington)
CIRCA	Center for Initiatives and Research on Climate Adaptation (Albay Province, Philippines)
CNCCP	China National Climate Change Program
CNG	Compressed natural gas
CO	Carbon monoxide
CO₂	Carbon dioxide
COP	Conference of the Parties (UNFCCC)
Dept.	Department
DFID	Department for International Development (U.K.)
DRI	Disaster Risk Index
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EAP	East Asia and the Pacific Region – World Bank
EASSD	East Asia and the Pacific Region Sustainable Development Department – World Bank
EASUR	East Asia and the Pacific Region, Urban, Water, and Disaster Management Sector Unit – World Bank

ECLAC	Economic Commission for Latin America and the Caribbean
EDB	Economic Development Board (Singapore)
EEA	European Environment Agency
EMI	Earthquakes and Megacities Initiative
EMS	Emergency Management Section of the Emergency Preparedness Bureau of the Seattle Police Department
ENSO	El Niño–Southern Oscillation
EU	European Union
F	Fahrenheit
FEMA	Federal Emergency Management Agency
GEF	Global Environment Facility
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
GHG	Greenhouse gas
GIS	Geographical Information System
GRIP	Global Risk Identification Program (UNDP)
HDB	Housing Development Board (Singapore)
HDI	Human Development Index
IADB	Inter-American Development Bank
ICLEI	International Council for Local Environmental Initiatives
IEA	International Energy Agency
IFRC	International Federation of Red Cross and Red Crescent Societies
INCD	Intergovernmental Negotiating Committee
INEMAR	Inventario Emissioni in Aria (Milan, Italy)
IPCC	Intergovernmental Panel on Climate Change
JBIC	Japan Bank for International Cooperation
km²	square kilometer
kton	kiloton
LED	Light emitting diodes
LEZ	Low emission zone in cities (e.g., London, Milan)
LGA	Local Government Association
LNG	Liquefied natural gas
MCDCC	Makati City Disaster Coordination Council (Philippines)
MCEPC	Makati City Environmental Protection Council (Philippines)
MDG	Millennium Development Goal
MEWR	Ministry of Environment and Water Resources (Singapore)
MOSE	Modulo Sperimentale Elettromecanico (Venice, Italy)
MoU	Memorandum of Understanding
N₂O	Nitrous oxide
NAPA	National Adaptation Programme of Action
NASA	National Aeronautics and Space Administration (USA)
NDMA	National Disaster Management Agency (Indonesia)
NDRC	National Development and Reform Commission (China)
NEA	National Environmental Agency (Singapore)

NGO	Nongovernmental organization
NH₃	Ammonia
NMVOC	Non-methane volatile organic compounds
NO_x	Nitrogen oxide
NRDC	National Resource Defense Council
NYC	New York City (USA)
NYCDEP	New York City Department of Environmental Protection (USA)
O&M	Operation and management
OECD	Organization for Economic Cooperation and Development
PACD	Plan of Action to Combat Desertification
PAP	People's Action Party (Singapore)
PCDD/Fs	Polychlorinated dibenzop-dioxins and dibenzofurans
PDR	People's Democratic Republic (Lao)
PM	Particulate matter
PM-2.5	Particles of 2.5 micrometers
PM-10	Particles of 10 micrometers
PUB	National Water Agency (Singapore)
RGGI	Regional Greenhouse Gas Initiative
R&D	Research and development
SCDF	Singapore Civil Defense Force
SDART	Seattle Disaster Aid and Response Teams
SEDAC	Socioeconomic Data and Applications Center
SGP	Singapore Green Plan
SINERGY	Singapore Initiative in New Energy Technologies
SLR	Sea-level rise
SO₂	Sulfur dioxide
TMG	Tokyo Metropolitan Government
TSP	Total Suspended Particles
UCLG	United Cities and Local Governments
UK	United Kingdom
UKCIP	United Kingdom Climate Impacts Program
UN	United Nations
UNISDR	United Nations International Strategy for Disaster Reduction
UNCED	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCOD	United Nations Conference on Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USA	United States of America
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
WRI	World Resources Institute