

CLIMATE CHANGE ASSESSMENT FOR ESMERALDAS, ECUADOR: A SUMMARY



CITIES AND CLIMATE CHANGE INITIATIVE

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LIST OF ACRONYMS

CAN	Comunidad Andina de Naciones (Andean Community of Nations)
ENSO	El Niño/La Niña-Southern Oscillation
ETA	Regional Climate Model
IMF	International Monetary Fund
INEC	Instituto Nacional de Estadísticas y Censos
IPCC	Intergovernmental Panel on Climate Change
PRECIS	Providing Regional Climates for Impact Studies (Regional Climate Model)
SIISE	Sistema Integrado de Indicadores Sociales del Ecuador
US-EPA	U.S. Environmental Protection Agency
SLR	Sea Level Rise

1.0

INTRODUCTION



Esmeraldas from the air. Photo © UN-HABITAT

1.1 CITIES AND CLIMATE CHANGE

Millions of people around the world are already, or will be, affected by climate change. Urban areas, which typically feature high concentrations of populations and buildings, are particularly vulnerable. Climate change is expected to compound the overall vulnerability of urban areas through rising sea levels, more frequent and stronger weather events, and inland flooding, among other challenges. At the same time, cities are major sources of greenhouse gases, and therefore must stand at the forefront of mitigation efforts. Mitigation and adaptation to the effects of climate change must take into account the vulnerable natural and human systems existing in our urban areas and their surroundings.

In many countries, cities are located in coastal areas, beside rivers, on steep slopes or other risk-prone areas. Infrastructure such as roads, water networks, transmission lines, schools and hospitals providing basic services for urban populations, are vulnerable to extreme climatic events such as floods, storms or landslides. Cities located in tropical coastal areas are particularly vulnerable to cyclones or rising sea levels, the frequency and intensity of which have been on the increase over the past three decades. In addition, salt water intrusion restricts the availability of fresh water in coastal areas, jeopardizing food security as once-fertile land becomes barren due to high salt content. Cities located in the hinterland or along rivers may be vulnerable to flooding. Conversely, areas where climate change is expected to reduce rainfall may be affected by drought, shrinking water tables and food scarcity.

In urban areas, the poor are the most vulnerable to the effects of climate change, and particularly slum dwellers in developing countries.

1.2 UN-HABITAT'S CITIES AND CLIMATE CHANGE INITIATIVE

Cities and local authorities have the potential to influence the causes of climate change and to find how to protect themselves from its effects. The Cities and Climate Change Initiative, a key component of UN-HABITAT's Sustainable Urban Development Network (SUD-Net), promotes enhanced climate change mitigation and adaptation in developing-country cities. More specifically, the Initiative supports the development of pro-poor innovative approaches to climate change policies and strategies. This Initiative builds on UN-HABITAT's rich experience in sustainable urban development (through the Environmental Planning and Management approach of the Sustainable Cities Programme and the Localizing Agenda 21 Programme) as well as on well-recognized capacity-building tools. The Initiative develops, adapts and disseminates the methodologies that put city managers and practitioners in a better position to cope with climate change.

FIGURE 1: Map of Equador



The Cities and Climate Change Initiative also promotes collaboration by local authorities and their associations in global, regional and national networks; the triple rationale being (1) to enhance policy dialogue so that climate change is firmly established on the agenda; (2) to support local authorities' efforts to bring about these changes; and (3) to enhance awareness, education and capacity-building in support of climate change strategies. A major outcome of the initiative will be the development of a set of tools for mitigation and adaptation.

This report comes under the Cities and Climate Change Initiative. Four pilot cities were selected in 2009, and one of their first assignments was for each to assess its vulnerability to climate change. In addition to Esmeraldas, the other three cities are Kampala, Uganda; Maputo, Mozambique and Sorsogon, Philippines. The aim is to provide insights on climate change adaptation and mitigation capacity in cities in developing and least developed countries. The rationale behind this report is to disseminate the early lessons of the Cities and Climate Change Initiative.

1.3 ESMERALDAS

Ecuador is located on the west coast of South America and is crossed by the equator (the country gets its name from the Spanish word for "equator"). Ecuador borders Colombia to the North, Peru to the East and South, and the Pacific Ocean to the West. Ecuador's capital city, Quito, is located in the north central part of the country.

Esmeraldas is a medium sized coastal city located in the northwestern corner of Ecuador and covers a land area of 16,155.97 km². The Teaone and Esmeraldas Rivers flow on one side of the city, and with the Pacific Ocean on the other side they make up the hydrological system of the canton. Esmeraldas is part of the Choco micro-region that has one of the highest rates of biodiversity in the world.

1.4 THE FRAMEWORK FOR CLIMATE RISK ASSESSMENT

The structure of this summary of the Esmeraldas Vulnerability Assessment is based on the proposed Framework for Urban Climate Risk Assessment developed by the Fifth Urban Research Symposium.



Esmeraldas settlements along the river bank are vulnerable to seasonal flooding. Photo © UN-HABITAT

The climate risk assessment framework focuses on how cities are affected by climate change as opposed to how they contribute to climate change, and thus adaptation rather than mitigation is highlighted. The framework analyses climate risk from three interconnected vectors – hazards, vulnerabilities and adaptive capacities. These vectors consist of a combination of physical science, geographical and socio-economic elements that can be used by municipal governments to create and carry out climate change action plans. 1 This summary has been re-structured to highlight these three perspectives.

1.5 ASSESSMENT METHODOLOGY

The Esmeraldas study explores the challenges

of information about past and future risks and opportunities associated with climate change. Two contrasting climate change projections for the year 2100 were used in both workshops to illustrate the range of possible futures that adaptation planning must account for and the identification of risks and opportunities. In the workshops, specific operational scenarios were constructed to identify key adaptation vulnerabilities and opportunities for the country and city. Operational scenarios are directly meaningful to policy makers and city managers. The following scenarios were investigated: health, water resources, infrastructure, and energy. The workshops and interviews were also the basis for identifying opportunities and challenges for adaptation.

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