

CLIMATE CHANGE ASSESSMENT FOR MAPUTO, MOZAMBIQUE: A SUMMARY



CITIES AND CLIMATE CHANGE INITIATIVE

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ACRONYMS

ANAMM	Associação Nacional dos Municípios de Moçambique
CCAMUP	Climate Change Adaptation and Mitigation Urban Plan
CCCI	Cities and Climate Change Initiative
CIF	Climate Investment Fund
DRR	Disaster risk reduction
FEMA	Fórum Económico para o Meio Ambiente - Economic Forum for the Environment
INAM	Instituto Nacional de Meteorologia - National Institute of Meteorology
INAHINA	Instituto Nacional de Hidrografia e Navegação – National Institute for Hydrography and Navigation
INE	Instituto Nacional de Estatística - National Institute of Statistics
INGC	Instituto Nacional de Gestão de Calamidades – National Institute for Disaster Management
IIP	Instituto de Investigação Pesqueira – Fisheries Research Institute
JP	Joint Programme
MICOA	Ministério para a Coordenação da Acção Ambiental – Ministry for the Coordination of Environmental Affairs
MMC	Maputo Municipal Council
NAPA	National Adaptation Plan of Action
NPO	National Project Officer
PEUMM	Plano de Estrutura Urbana do Município de Maputo – Urban Master Plan of Maputo Municipality
PPCR	Pilot Programme for Climate Resilience
PRO-MAPUTO	Programa de Desenvolvimento Municipal de Maputo - Maputo Municipal Development Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-HABITAT	United Nations Human Settlements Programme

1.0

INTRODUCTION

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.

The Cities and Climate Change Initiative also promotes collaboration by local authorities and their associations in global, regional and national networks; the triple rationale is (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 Maputo, the other three cities are Esmeraldas, Ecuador, Kampala, Uganda; and Sorsogon, Philippines. The aim of the assessments 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 MAPUTO CITY

Mozambique has a land area of 784,090 km² which stretches 2,515 km along the coast of South-Eastern Africa. Its boundaries are the Indian Ocean to the East, and inland to the South, West and North lie South Africa, Swaziland, Zimbabwe, Zambia, Malawi and Tanzania. Maputo, the capital city of Mozambique, is located at the extreme South of the country and covers an area of 300 km², with a population of about 1.1 million, according to preliminary 2007 census data (INE, 2008). A metropolitan system links Maputo, Matola and Marracuene District, which together are known as Greater Maputo, with a fluctuating population of 2.0 to 2.5 million.

1.4 THE FRAMEWORK FOR CLIMATE RISK ASSESSMENT

This summary of the Maputo city vulnerability assessment is based on the proposed Framework for

FIGURE 1: Map of Mozambique



Maputo City ©UN-HABITAT/B.Oballa

Urban Climate Risk Assessment developed by the Fifth Urban Research Symposium. The climate risk assessment framework focuses on the way cities are affected by climate change, as opposed to the way they contribute to it, an approach that highlights adaptation rather than mitigation. The framework analyses climate risk from three interconnected perspectives: hazards, vulnerabilities, and adaptive capacities. These perspectives combine physical science with, geographical and socio-economic elements that can be used by municipal authorities to devise and carry out climate change action plans.¹ This summary has been re-written to highlight these three perspectives.

1.5 ASSESSMENT METHODOLOGY

In Maputo, the preliminary assessment aimed at an overview of climate change issues and challenges in the city. The document highlights current policies and strategies at the national and local levels; on top of this come a general analysis of existing tools and research, on-going and planned activities and initiatives (such as training and capacity- building, mitigation and adaptation projects, etc.) and relevant ongoing information events and networks occurring in Mozambique and in Maputo.

The preliminary assessment is based on a review of literature on climate change issues, including data collection and analysis, existing legislation and strategies, scientific papers, recently implemented and planned initiatives and projects, as well as interviews with central and municipal government officials and specialised professionals.

¹ Mehrotram Shagun et al., 2009.

2.0

CLIMATE CHANGE HAZARDS

Climate change hazards include “the climate-induced stresses on the city and are identified through observed trends and projections derived from global climate models and regional down-scaling”². These “stresses” take the form of heat waves, droughts, inland floods, accelerated sea-level rise and flooding of coastal cities, and can be tracked through changes in temperatures, precipitation and sea level.

While focusing on the way climate change is bound to affect urban areas, it seems relevant to report the main findings of research carried out by the International Institute for Environment and Development (IIED, 2007), as follows:

- 10 per cent of the world population live in coastal areas that lie within just 10 metres above sea level;
- Nearly two-thirds of urban settlements with more than five million residents are at least partially in the 0-10 metre zone;
- 21 per cent of the urban populations of least-developed nations are in the zone, compared to

2.1 RISING TEMPERATURES

When focusing on climate change and related impacts in Southern Africa, recent research strongly suggests that over the coming decades, rising temperatures could change the rainfall regime (Hulme, 1996). As far as the whole continent is concerned, the United Nations Environment Programme (UNEP, 2002) mentions a warming process of about 0.7 °C during the 20th century, based on historical records, i.e., in line with world-wide trends. Research by the Intergovernmental Panel on Climate Change (IPCC, 1990, 1992, 2001 and 2007) confirms these trends. Still according to Hulme (1996), if nothing is done to curb future greenhouse gas emissions, the model delivers a scenario where by 2050 temperatures will rise an average 1.7°C compared with the 1961-90 period. According to the Inter-Governmental Panel’s 2007 report, the trend observed in Mozambique is one of rising temperatures.

FIGURE 2: Variations of the Earth’s Surface Temperature for the past 100 years in Africa

Mean temperature anomaly in °C

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