

UN HABITAT CITIES AND CLIMATE CHANGE INITIATIVE NEWSLETTER

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Innovative School Designs Increase Climate Resilience in Mozambique

Introduction

Natural disasters are part of life in Mozambique. Being an elongated country located in south-east Africa, with 2,470 km of coastline facing the Indian Ocean where nine international rivers finish their courses, Mozambique is frequently hit by tropical cyclones that generate floods. These conditions exact an elevated human and socio-economic cost.

A strong relationship exists between global climate change and the increasingly damaging impact of certain types of natural disasters such as storm surge and flooding. Although disasters triggered by natural hazards affect developed and developing countries alike, by one estimate the disaster-related losses (as a percentage of GDP) are now 20 times greater in developing countries than in industrialized ones.

High levels of vulnerability help to exacerbate natural hazards' effects on the ground. This is particularly true in Mozambique, both in rural areas and in fast-growing urban areas. The Government's strategy to mitigate the impact of these events includes, among others, resettlement of populations that inhabit disaster-prone areas.

Several complementary UN-Habitat programmes are helping the Government of Mozambique to address climate change. One innovative approach consists in exploring innovative architectural solutions that address a given risk profile, in order to increase adaptation to climate change and provide an effective and sustainable alternative to national policies that promote relocation. Hence the architectural concept of 'double-purpose'



Flood-proof elevated school in Maniquenique, Mozambique ©UN-Habitat/Arianna Francioni

public buildings: a social facility such as a school which serves its primary purpose during normal times, but which is designed in a way that allows it to cope with extreme environmental conditions and even be used as a shelter during flood or cyclone events. Innovative design elements can also involve the reinterpretation of traditional construction techniques in a way that allows local inhabitants to feel at home in and not alien to these new buildings. Below we survey several school projects that UN-Habitat has supported that reflect these approaches.

Living with Floods

Maniquenique, located in the district of Chibuto in the province of Gaza, is an isolated area in the midst of the Limpopo River Basin characterized by extensive rainfall and cyclical floods. An elevated school

building, constructed there by UN-Habitat in response to the need expressed for such a facility, was the first implementation of the 'double-purpose' platform concept. The idea of building a raised platform that could function normally as a school but that could also serve as a shelter for 850 people during times of disaster was in perfect harmony with one of the project's original goals, to reduce risks -- another priority expressed by the local community.

The building design features several innovative elements: a raised platform, built on concrete 'stilts', that sits 1.5 metres above grade; a reinforced roof structure that is capable of supporting the weight of at least 50 people seeking refuge in the event of extreme flooding; and a rain water harvesting system.

Inhangoma is located in Mutarara district in the province of Tete, in the midst of the Zambezi River flood plain. The UN-Habitat project there, a building that includes classrooms and multi-functional spaces, represents an evolution of the concept pioneered in Maniquenique. The ground floor of the *Inhangoma* building is elevated above grade on a platform surrounded by stairs and ramps. The single-pitched roof has been designed as a rainwater harvesting system, with gutters and down pipes connected to large tanks located at the back of the structure. In the event of intensive flooding people can seek refuge in an attic space provided above the enclosed room.

Building with Winds

Vilankulo, in the province of Inhambane, is a coastal village facing the Indian Ocean; it is one of the most cyclone-affected areas in Mozambique. Here UN-Habitat has implemented a kindergarten with an innovative design. The design represents a 'sampler' of the different cyclone-resistant types of construction that are being tested locally, that make the area a 'living workshop'.

With this kindergarten, innovation began with the concept that a building's reaction to cyclone winds is related to its shape, weight and construction materials. The building's compact plan includes almost 200 square meters of educational spaces, but the real technological innovation is found in the building's roof. This roof is



Cyclone-proof kindergarten in Vilankulo, Mozambique ©UN-Habitat/Arianna Francioni

made by a prefabricated wire mesh concrete vault whose shape, slope and weight ensure excellent reaction to cyclones. The process of casting these elements is simple and easy to repeat, once local builders have been properly instructed. The kindergarten is another example of 'double-purpose' building: a public structure serving as a shelter in the event of cyclones.

Conclusions

These simple, low cost pilot interventions are an effective demonstration of the concept of 'living with' natural hazards; they are a concrete example of adaptation to climate change and disaster risk reduction. Safe havens satisfy communi-

ties' needs both for social facilities during normal periods and shelter during times of severe weather, allowing people and the building to overcome the disaster and restart life in the same place.

The long-term aim of UN-Habitat is to disseminate this alternative approach and trigger a ripple effect through National Governments and communities in thinking 'outside the box' about alternatives to resettlement.

Mapping the Risks to a Batik Industry City in Indonesia

The coastal city of Pekalongan is small, but its reputation as a leading batik producing centre is considerable. However seashore abrasion, salt water intrusion, the decay of the drainage systems and overcrowding all threaten the small cottage workshops that form this batik-producing cluster economy.

UN-Habitat undertook a variety of surveys and mapping activities to chart out the risks. The implementing team produced mini-atlases of neighbourhoods where batik is a key livelihood, undertook a value chain analysis of where environmental hazards pose the largest threats, and discussed action plans at the neighbourhood and city levels to ascertain how communities and city officials gauge the threats and rank possible responses. Evaluating the spa-

tial information on this cluster economy was important, particularly charting out and compiling data on where the livelihoods of the poorest batik workers are under threat because of a regularly-flooding urban environment.

Neighbourhood mini-atlases are unconventional compendiums that compliment conventional government statistics. They empower communities to discuss programming and budgeting priorities. Such community consultation is now possible in theory, given the progress that decentralization has made in Indonesia. However, adequate tools are required to support such community-based processes. Mini-atlases proved to be a tool that fostered clarity and transparency.



Female batik workers applying dyes in Pabean, Indonesia ©UN-Habitat/Ian Pratomo

First Sub-Regional Workshop of CCCI Held in Fiji

The first sub-regional workshop of the Cities and Climate Change Initiative (CCCI) Pacific demonstration cities was held in Suva, Fiji 1 -3 June 2011, building momentum for local government to better respond to climate change in the Pacific Region. The workshop attracted over 35 participants representing Fiji, Kiribati, Papua New Guinea, Samoa, Tuvalu, Vanuatu, with observers from the Royal Melbourne Institute of Technology (RMIT), and Wellington City Council. The workshop was organized by UN-Habitat in collaboration with the Commonwealth Local Government Forum (CLGF), Pacific.

The workshop aimed to build the capacity of national teams in CCCI Pacific demonstration cities to undertake -- independently and in a participatory manner -- Climate Change National Scoping Studies



Suva, Fiji ©UN-Habitat/Angela Pinzón

and City Vulnerability and Adaptation Assessments. Throughout the workshop participants identified approaches to localising methodologies to best suit local needs and circumstances, whilst better linking the urban sector into national climate change policy frameworks. In conclusion, workshop participants voiced

their request to further continue CCCI capacity building activities in the Pacific to better support the development of local climate change resilient strategies and action planning.

UPCOMING EVENTS

Arcadis & UN-Habitat Shelter Academy Amsterdam/Rotterdam, 13-15 September

For cities to prosper, strategic choices must be made to develop infrastructure which encourages business development, stimulates job opportunities and provides basic services and better living conditions for all. Port cities are uniquely positioned to benefit from gains which globalization portends, but they are also disproportionately vulnerable to a growing number of economic and environmental risks.

The Shelter Academy is thus offering participants from developing and emerging countries an open forum to address critical issues in their cities. They will have the opportunity to increase their knowledge on urban development challenges and responses.

The Netherlands will serve as a living classroom with technical visits for a hands-on perspective on coastal protection, water management and harbor development. Participants will also develop action plans for their own cities.

For more information visit <http://www.arcadis.com/Shelter.aspx>

Asia-Pacific Course on Adaptation Seoul (vicinity), 7-15 October

UN-Habitat, the International Urban Training Centre (IUTC) and the Institute for Housing and Urban Development Studies (IHS) are offering an Asia-Pacific Regional Training Course on Urban Climate Change Adaptation for Local Governments. The course draws on good practices from the Cities and Climate Change Initiative (CCCI) and decision-making tools developed by IHS.

Senior professionals from local governments in the region are invited. By the end of the course, participants will be able to prepare local climate change action plans that address the specific needs of their city. The course aims to provide knowledge and skills that can help officials to develop local climate change action plans.

Through lectures, seminars, presentations, group exercises and excursions to Gangneung and Seoul, participants will be engaged in group work on vulnerability mapping, climate change action prioritisation and an online data base of climate technologies.

For more information visit www.unhabitat.org/ccci or www.iutc.org

COP17

Durban, 28 November - 9 December

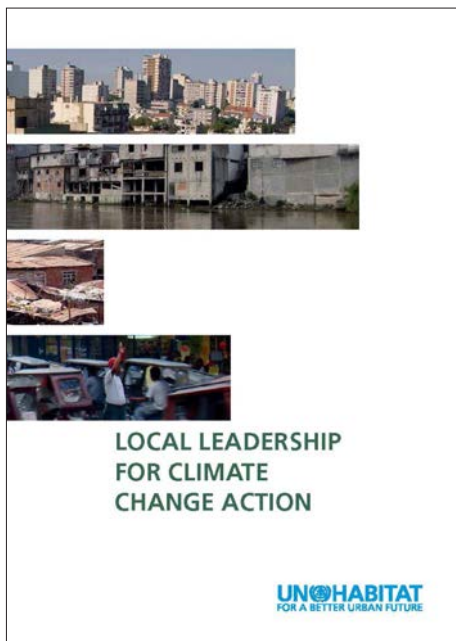
The African drum is sounding in advance of the 17th annual Conference of the Parties (COP 17) to the United Nations Framework Convention on Climate Change (UNFCCC), to be held 28 November - 9 December 2011 in Durban, South Africa. The African Secretariat of ICLEI -- Local Governments for Sustainability is helping to organise two pre-conference events that will help ensure that African local governments are heard at COP 17. Firstly, on 20-22 September ICLEI and the City of Lagos will hold a Congress of West African Mayors in Lagos. Immediately following that event, on 25-27 September local officials will come together in Durban for a Local Government Convention: Adapting to Climate Change, Towards COP 17. UN-Habitat and the Cities and Climate Change Initiative (CCCI) expect to participate in both of these preparatory events.

For more information visit http://unfccc.int/meetings/cop_17/items/6070.php

Local Leadership for Climate Change Action

This publication is a call to action for cities to address Climate Change. It presents information and practical case studies of what cities can do to respond to one of today's leading challenges in 12 key messages. This publication takes the view that climate change presents cities with an opportunity to review urban policy and local strategies which would lead to more sustainable, livable and vibrant cities.

For more information visit <http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3162>



Urban World Cities and Climate Change Edition

UN-Habitat's flagship periodical, Urban World, features articles and cities-related news written by top external experts and UN-Habitat staff. It circulates quarterly to an audience of 30,000. The upcoming edition, which will be released at the main celebrations of this year's World Habitat Day on 3 October in Mexico, will focus exclusively on cities and climate change.

For more information visit <http://www.unhabitat.org/categories.asp?catid=558>.

ABOUT US

Headquartered at UN-Habitat in Nairobi, the Cities and Climate Change Initiative (CCCI) involves the participation of more than 20 cities worldwide. It targets medium-sized cities in developing and least-developed countries and emphasizes good governance and practical initiatives for the municipalities and their citizens. The CCCI team has adapted participatory processes

developed previously by UN-Habitat so as to specifically address climate change issues within the city. A complementary set of tools is being developed to support cities in raising awareness on the impact of climate change and undertaking mitigation and adaptation activities. Since 2008, CCCI has been generously supported by the Government of Norway, the United

Nations Development Account, the Cities Alliance, the Government of Sweden and other sources of global, regional, national and local funding. Newsletters of the Cities and Climate Change Initiative are periodically published electronically. For more information, or to be added to our mailing list, contact uepb@unhabitat.org or visit www.unhabitat.org/ccci.

CCCI Cities and Countries

