

URBANIZATION AND THE ROLE OF GOVERNMENT IN FACILITATING ACTION IN CITIES: MIGRATION POTENTIAL IN THE BUILDING SECTOR



Flooded slum after 2005 tsunami in Indonesia © UN-Habitat

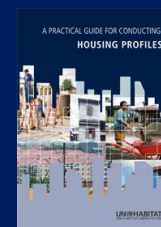
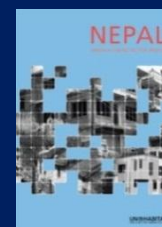
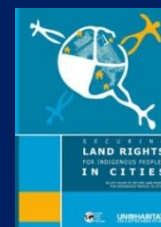
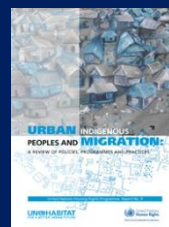
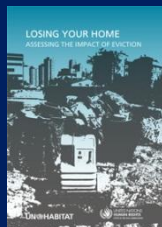
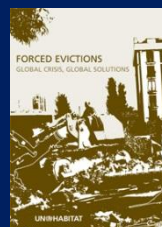
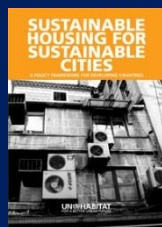
Context

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- 1/3 of Greenhouse Gas Emissions due to building sector
--> Extreme weather events a threat to housing, particularly slums

Housing and Slum Upgrading Branch

- Housing Unit works with climate change mitigation in the contexts of slum upgrading, reconstruction, social housing and large scale affordable housing



NATIONAL AND MUNICIPAL POLICIES TO MITIGATE THE IMPACTS OF CLIMATE CHANGE



Updating building codes and standard regulations promotes:

Sustainability

- Include climate specific building codes and guidance
- Allow the use of traditional and local building materials and building methods

Disaster risk reduction

- Resist local disasters and climate change related risks
- Address affordable disaster risk reduction
- Recognize the close links between risk reduction and climate change mitigation

Cities for Climate Change Initiative

- Addressing urban issues including the building sector in the context of national climate change policies
- Most recent recommendations in Policy Note 3



Aerial view of New Orleans after Hurricane Katrina © Wikimedia commons/Jocelyn Augustino

EXAMPLES FROM COUNTRIES



Lemban's house: a settler's house in East Sepik © Assai

Policies

- ❑ **São Paulo Brazil 2007 ordinance in the municipal code:** residential, commercial and industrial buildings need to warm 40% of their water with solar power
- ❑ **Rwanda:** Plans to adopt buildings codes that promote passive housing principles, rain water/grey water recovery and solar heated hot water
- ❑ **India:** National Climate Change Policy requires education for builders, developers and university students on energy efficiency measures related to buildings

Policies cont.

- ❑ **Philippines:** The 2009 Climate Change Act resulted in land use plans, official guidelines, training and pilot projects
- ❑ **Indonesia:** National plan calling for effects of climate change to be integrated into design, code and physical infrastructure
- ❑ **Havana, Cuba:** Incremental approach by encouraging families to make a hurricane-resilient room in their homes through using sugar cane ash stabilized cement for concrete

Infrastructure

- ❑ **New York after Super Storm Sandy and Fukushima after the Tohoku earthquake and tsunami:** Locate generators for electricity and nuclear power over the local maximum flooding level/maximum tsunami wave height
- ❑ **Japan:** Anti-tsunami storm walls, floodgates in rivers, sensors in the sea and ground which detect earthquake and tsunamis and are connected to personal mobile phones
- ❑ **Uganda:** Flood channeling plan in Kampala by UN-Habitat
- ❑ **Namibia National Climate Change Policy:** infrastructure should not be located on flood prone areas

Buildings

- ❑ **Myanmar through UN-Habitat:** cyclone resistant housing using toddy palm timber and bamboo after cyclone Nargis in 2008



Cyclone resistant housing for IDPs in Kungyangone Myanmar © UN-Habitat

- ❑ **Former Soviet states at city-level:** energy retrofitting and energy-efficient pilot projects of multi-story buildings



Building undergoing retrofitting in Czech Republic © UN-Habitat

Sustainable Housing



Bamboo house in Ecuador © INBAR



Stabilized soil blocks in Darfur © UN-Habitat



Straw-bale house in China © World Design Arch.



Ferro-cement house in Cuba © Eco-Sur

ADAPTATION AND OTHER CO-BENEFITS OF UNDERTAKING CLIMATE CHANGE MITIGATION



Climate Change Mitigation

Housing Sustainability

- ❑ A holistic approach linking housing with infrastructure, services and settlement planning with four dimensions:
 - > environmental, economic, social and cultural

Disaster Risk Reduction

- ❑ prohibiting new development in high risk areas
- ❑ respecting human rights when assisting communities in disaster areas
- ❑ new strategies for disaster resilient buildings
 - > traditional DDR methods for affordable housing

Compact city, mixed land use

Climate Change Mitigation

Promotes local low-embodied energy building materials through:

Natural materials

- Bamboo
- Timber
- Straw-bale
- Earth

Recycled materials



Half-timber and stone infill hut in Pakistan
© UN-Habitat

Climate Change Mitigation

Modified conventional materials

- Alternatives stabilizers for concrete
- Prefabricated materials
- Natural composite materials
- Recycled composite materials



Laminated bamboo © INBAR



Concrete panels © Eco-Sur

DESIGN OPTIONS AND CUTTING-EDGE TECHNOLOGIES



Solar panels on new housing in Rio de Janeiro Brazil © UN-Habitat

Design Considerations

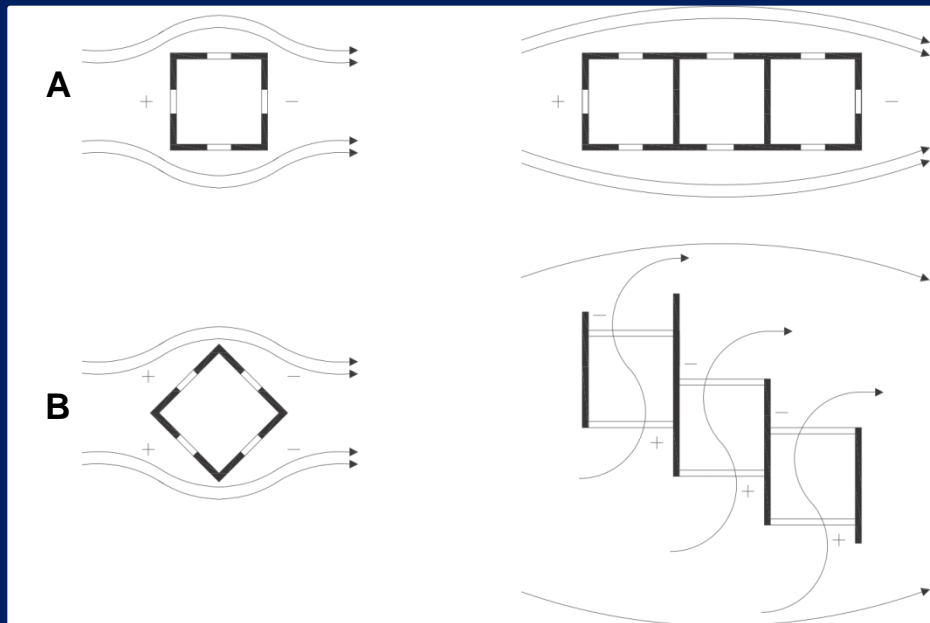
Design for Climate Types

- ❑ **Hot and humid:** shading and long eaves, open layout for ventilation, composite roof structure, raised floors and open settlement plans
- ❑ **Hot and dry:** materials that reflect direct sunlight, reduction of heat gain, protection from storming and sandy winds, thermal mass, closed settlement plans
- ❑ **Temperate/cold:** energy efficient heating, insulation, tight corners, dark colors

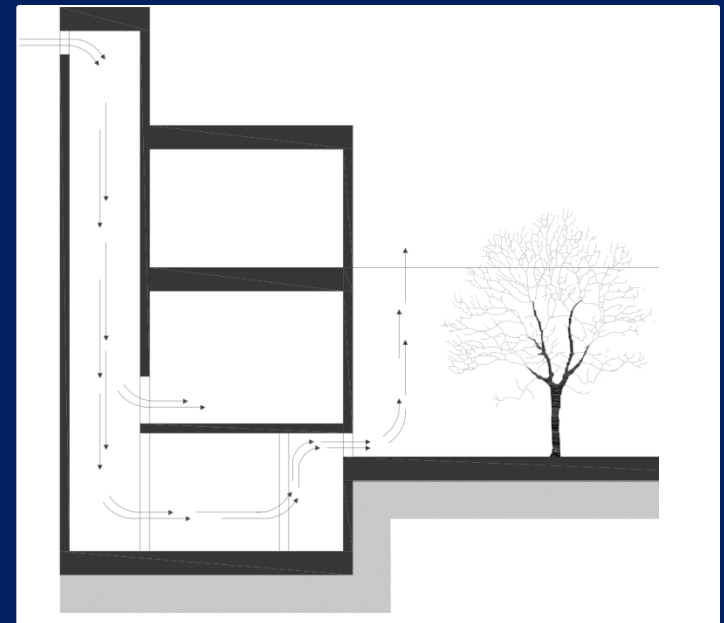
Local technologies

- ❑ Solar heating of water, solar panels for electricity, water recycling and rainwater harvesting

Bioclimatic design: passive Ventilation and Passive Heating



Orienting buildings to maximize air movement.
A- limited wind exposure. B- maximized wind exposure.



A typical Yazd courtyard house. The wind is captured in a wind catcher and directed to a basement allowing ventilation in the living quarters.

INTERNATIONAL INITIATIVES SUPPORTING DEVELOPING COUNTRIES IN THE GREEN BUILDING SECTOR



Bamboo home built in Olon community, Santa Elena province, Ecuador © INBAR

Global Housing Strategy

□ UN-Habitat Global Housing Strategy

The Global Housing Strategy aims to (re)position housing within the global contemporary debate on economically viable, environmentally and culturally sustainable and socially inclusive cities

Thematic Clusters

Cross Cutting issues:

- Housing Rights
- Climate Change
- Gender
- Youth



The Global Housing Strategy

Global Networks

□ **Global Network for Sustainable Housing:**

Platform for key global partners working with sustainable and affordable housing

Publications: “Sustainable Housing for Sustainable Cities: A Policy Framework for Developing Countries” and “Going Green: A Handbook of Sustainable Housing Practices in Developing Countries”

□ **Co-operation UN-Habitat Housing Unit and UNEP and UNECE:**

Forthcoming publications:

- with UNEP “Social Housing and Green Buildings,”
- with UNECE “Casebook: Good Practices for Energy-efficient Housing in the UNECE Region”

ROLE OF NON-STATE ACTORS



Public space in Lamu, Kenya © UN-Habitat

Climate Change Mitigation

Civil Society

- ❑ UN-Habitat with CRAterre: Global Rating Tool for Affordable Sustainable Housing

The impact of housing, support mainstreaming of green building, change in building codes and housing standards

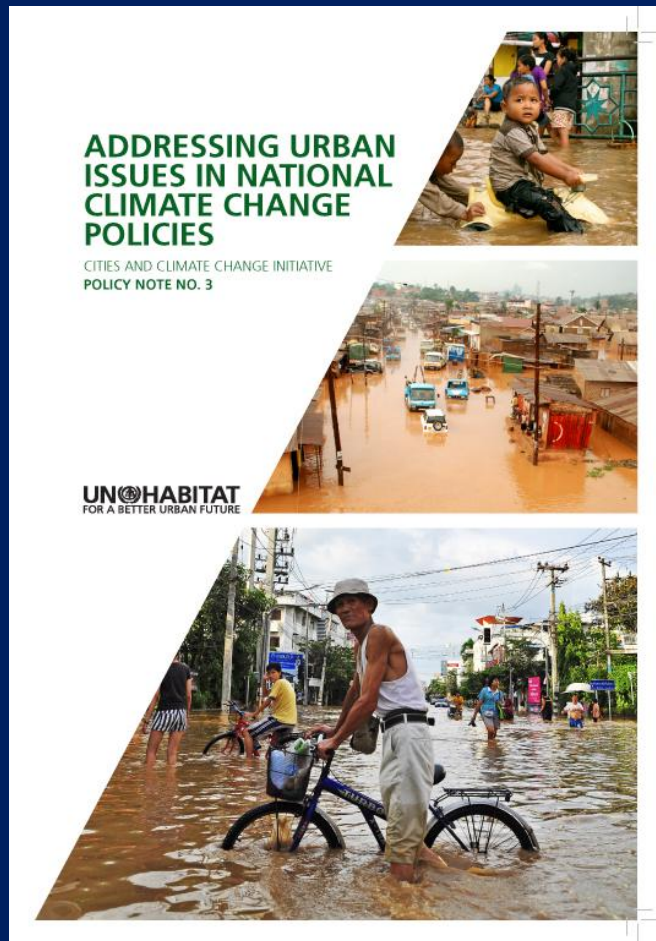
Private Sector

- ❑ Possibility of cross-subsidies
- ❑ “Green Building Council” model in Africa in collaboration with the World Green Building Council

Academia

- ❑ Birmingham, Cambridge, Chalmers, Minnesota, Oxford Brookes and Witwatersrand

Launch of Policy Note 3 by UN-Habitat's Cities & Climate Change Initiative (CCCI)



“Addressing Urban Issues in National Climate Change Policies”

- ✓ Based on **review** of 20+ National Climate Change Policies
- ✓ Includes **19 policy recommendations** from perspective of cities
- ✓ Mitigation, adaptation, multi-level governance
- ✓ **Examples** of on-the-ground actions that policies should lead to
- ✓ **Download:** [www/unhabitat/ccci](http://www.unhabitat/ccci)

Thank You

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