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SUSTAINABILITY THROUGH UNIQUENESS

4th Global Policy Conference (GCPC) | 16 August 2018

Towards Climate Resilient Cities in the Global South: Leveraging on Spatial Planning

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SUSTAINABILITY THROUGH UNIQUENESS

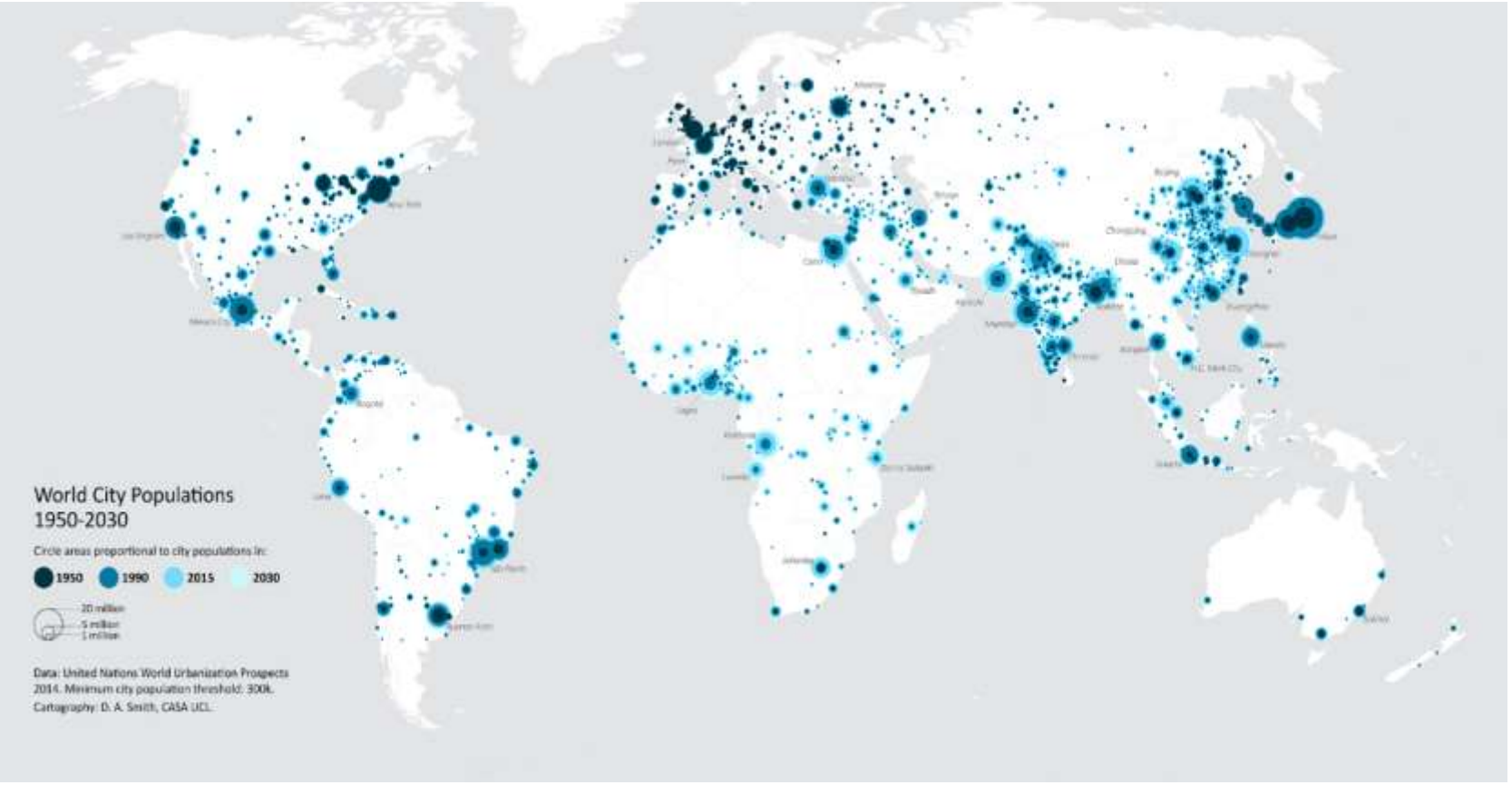
Sustainable Urban Development | Climate Resilient Urban Planning | Heritage Revival
Policy and governance | Climate Finance | Clean Energy

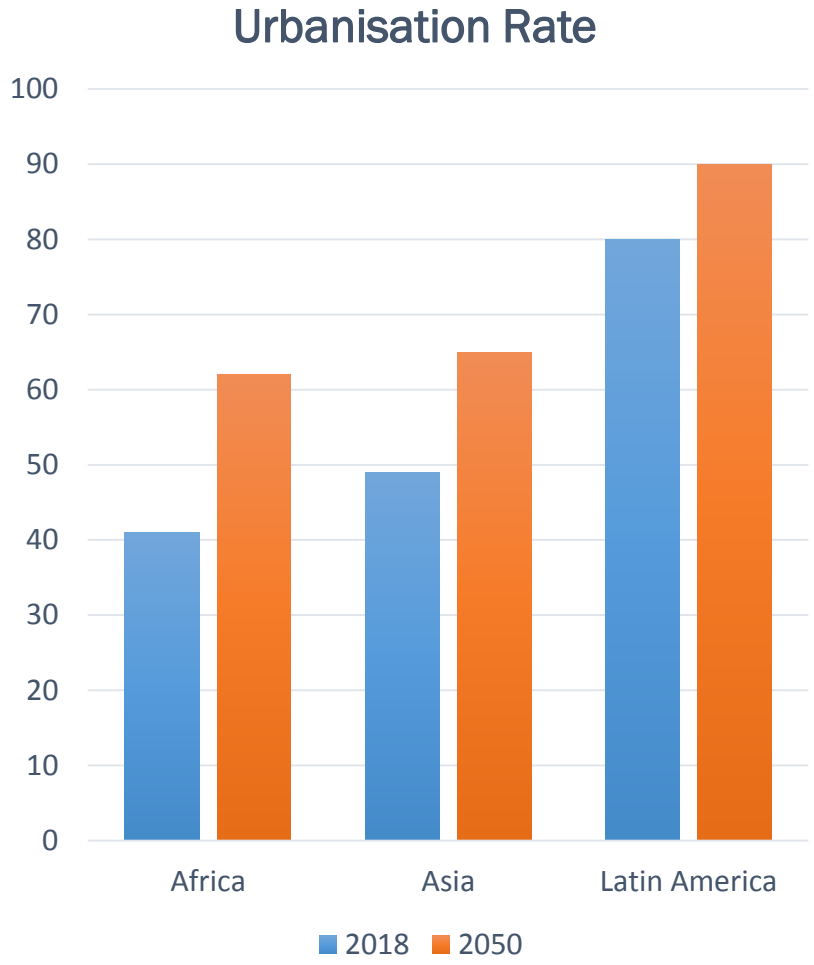
International think tank and consultancy

Thriving cities harnessing on their unique natural and cultural assets

40 countries in Asia and Europe | 25 Asian cities | ADB, CDIA, Rockefeller Foundation, UNDP, UNECE, UNEP, UNESCAP

Rapid urbanisation in the Global South



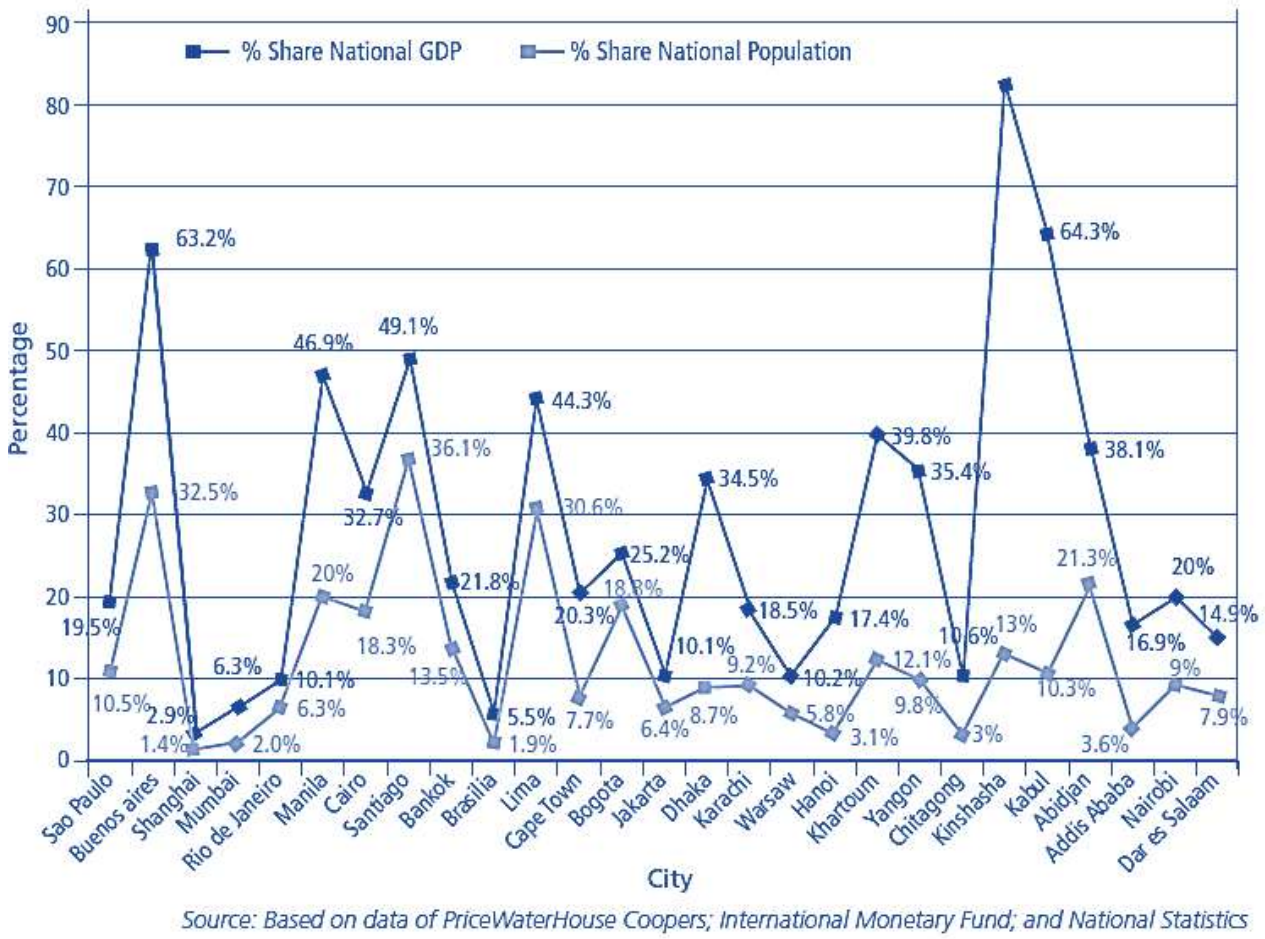


96% of all urbanization by 2030 will occur in the developing world

(World Bank, 2014)

GS cities are major GDP contributors. At the cost of social challenges.

Share of National Population and GDP in Key Cities in Developing Countries

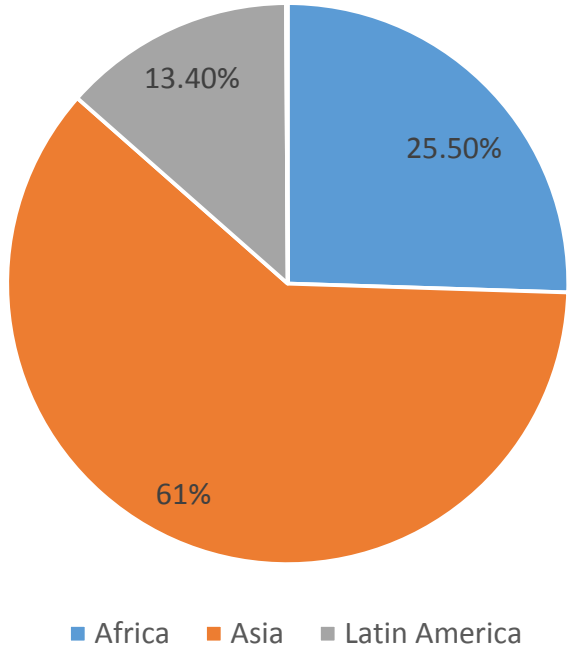


Source: Based on data of PriceWaterHouse Coopers; International Monetary Fund; and National Statistics

15% global GDP from GS cities

(McKinsey Global Institute, 2011)

Global slum population distribution by region



World slum dwellers

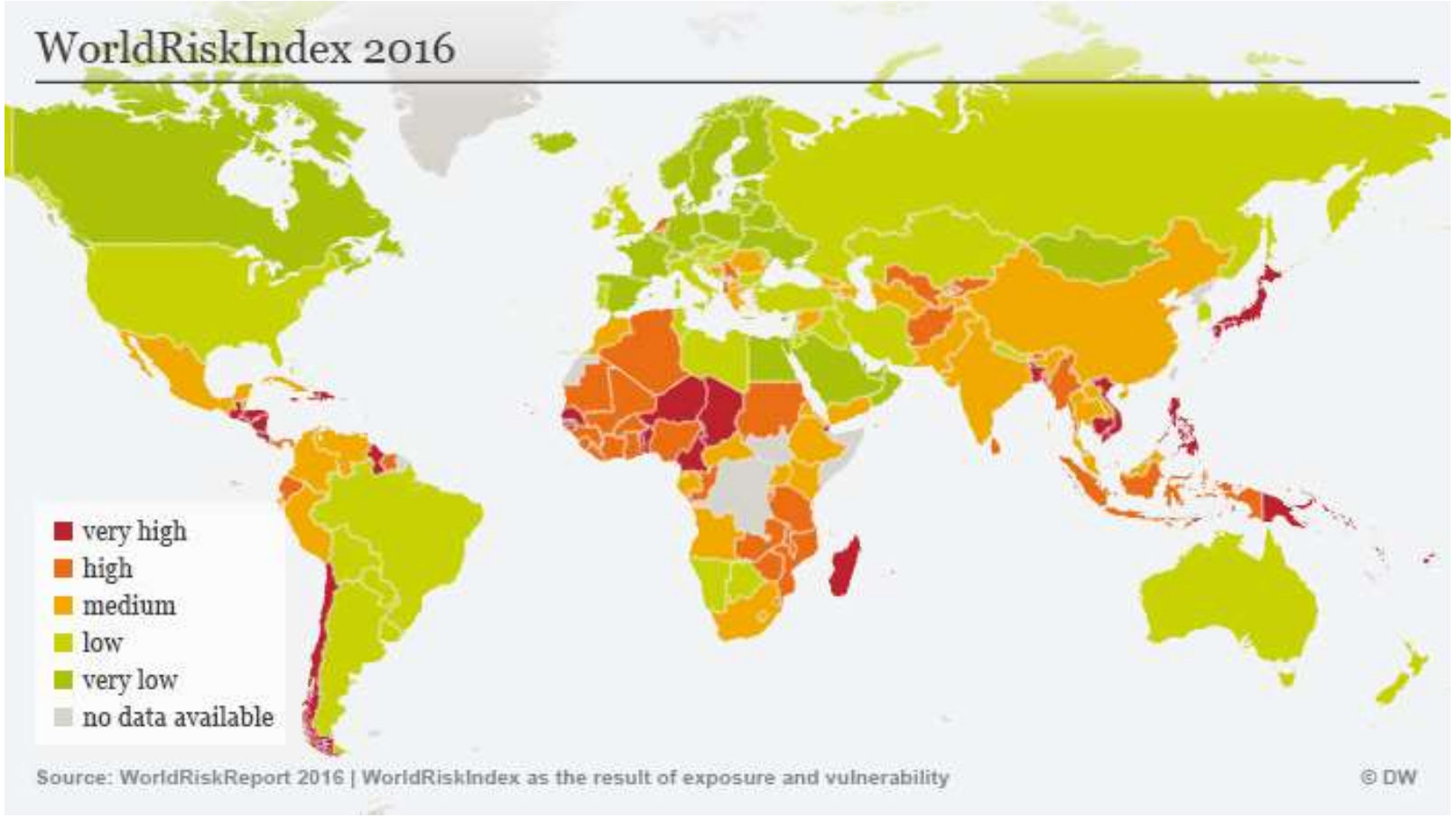
2018: 1 billion

2030: 2 billion

(UN-HABITAT)

..further exacerbated by climate change

Global distribution of vulnerability to climate change
Combined National Indices of Exposure and Sensitivity



Sea Level Rise

Increasing temperatures

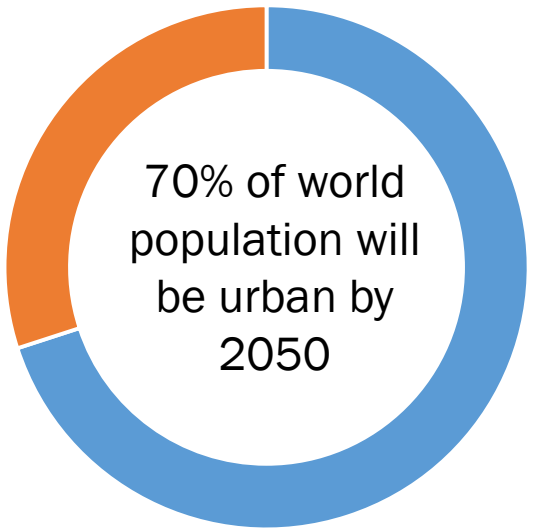
Water scarcity and sanitation issues

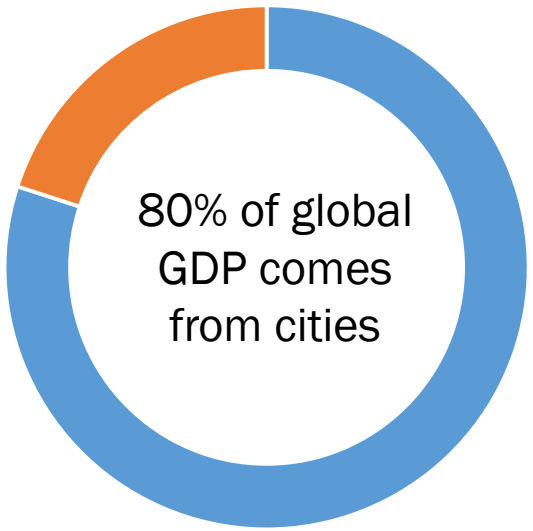
Disaster Proneness

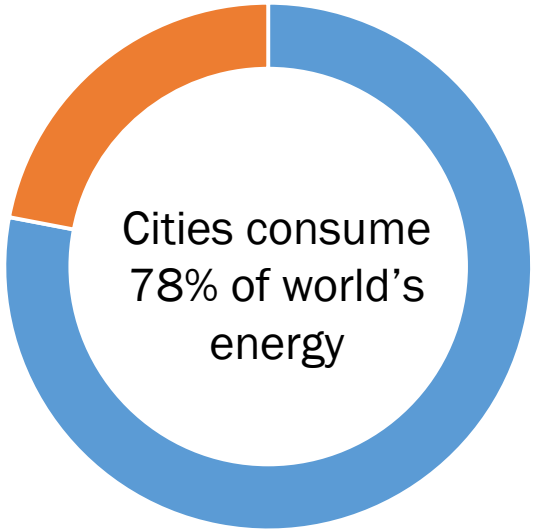
Health Risks

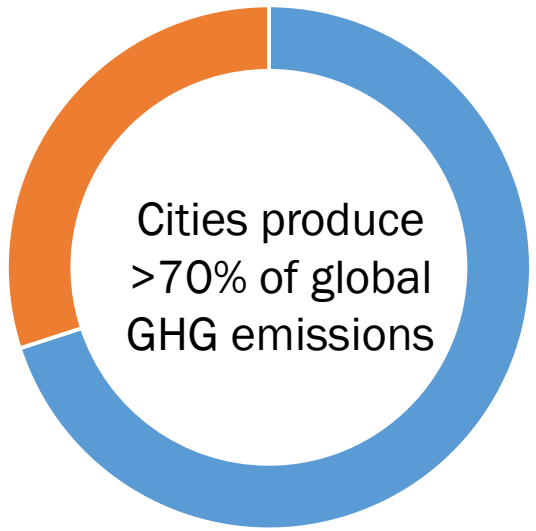
360 million urban residents live in coastal areas less than 10 meters above sea level and are vulnerable to flooding and storm surges (World Bank)

Cities – major contributors to climate change





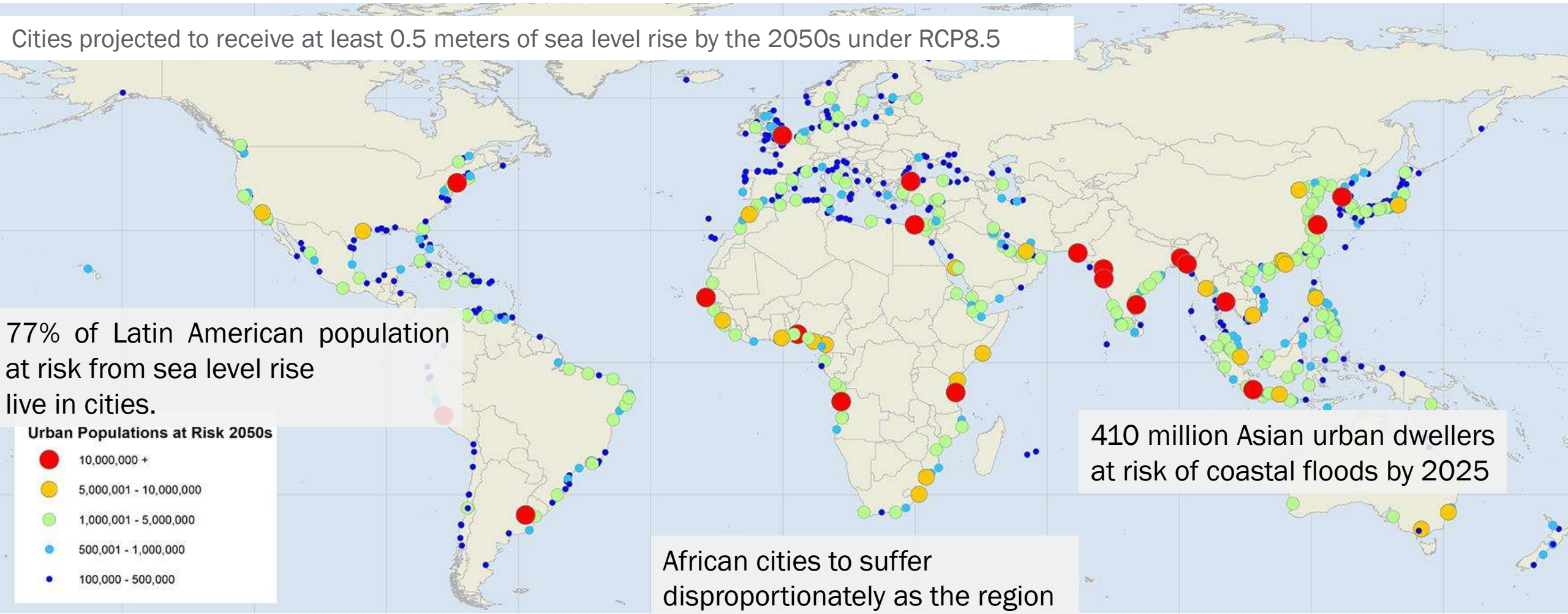




"Cities are where the climate battle will be won or lost,"

Patricia Espinosa, executive secretary of the U.N. Framework Convention on Climate Change (UNFCCC)

Cities projected to receive at least 0.5 meters of sea level rise by the 2050s under RCP8.5



77% of Latin American population at risk from sea level rise live in cities.

410 million Asian urban dwellers at risk of coastal floods by 2025

African cities to suffer disproportionately as the region is warming up 1.5 times faster than the global average.

Urban poor particularly vulnerable to climate risks and extreme weather events

Natural or man made disasters?

Encroachment of Natural Ecosystems

Chennai lost 90% of its water bodies over last 40 years

Chennai flood 2015 - Largest flood in 10 years, **economic loss of $2.2 billion, 41%** of total economic loss in India due to disasters in 2015.

Site for Phoenix mall in 2000

Chennai floods 2015

Phoenix mall 2017

Before

Pallikaranai Marshland, Chennai

After

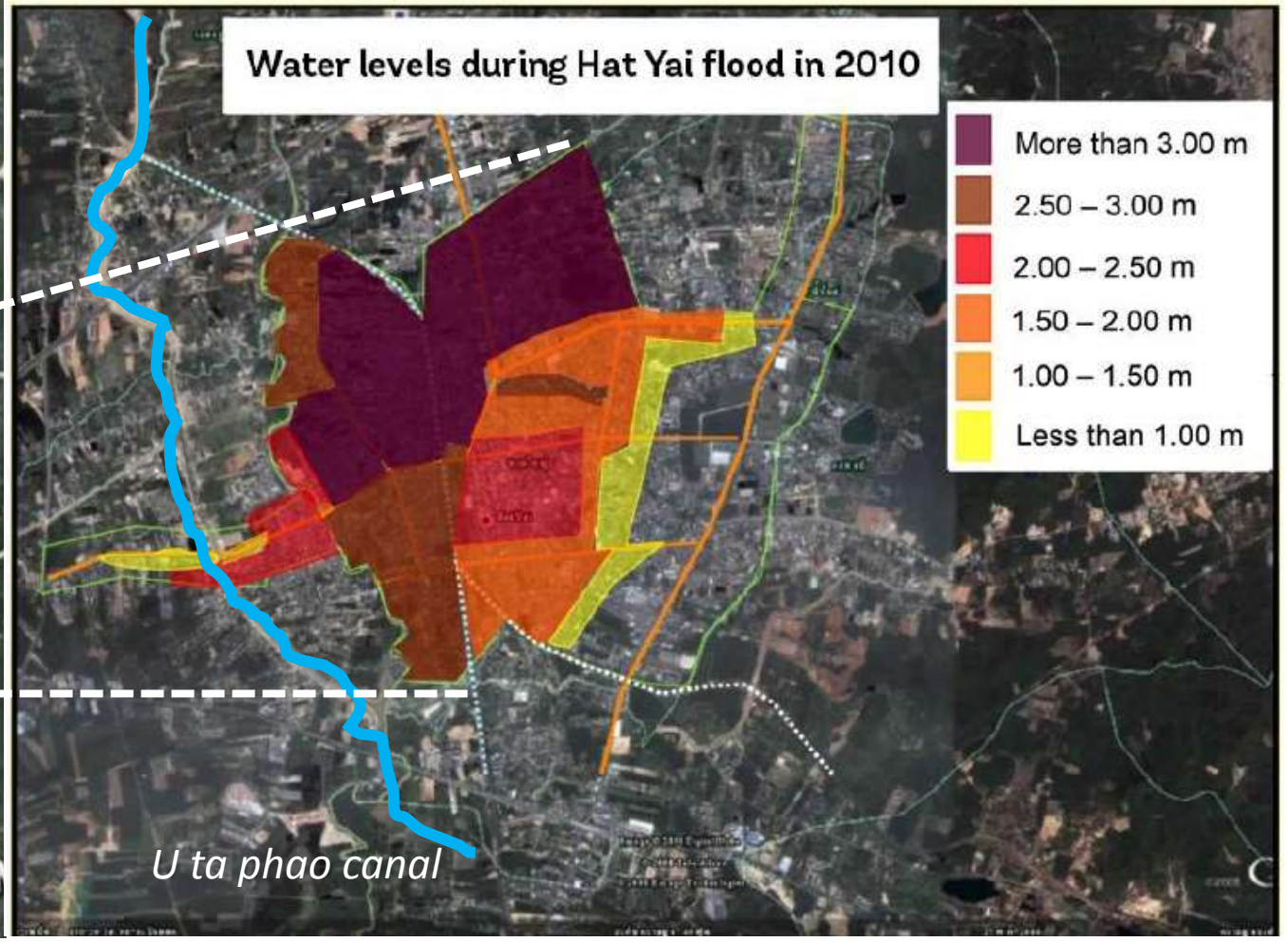
Key role of peri-urban natural ecosystems

Hat Yai, Thailand

- From **1982 to 2002**, forest resources in the basin's upstream decreased from 48,281 to 26,781 ha
- An equivalent **reduction of 44.5 % forest cover**
- **Major floods** in 1983, 2000 & 2010

Hat Yai, Thailand

Nearly 80% land area of Hat Yai is low-lying and vulnerable to hazards such as heavy precipitations and sea level rise.

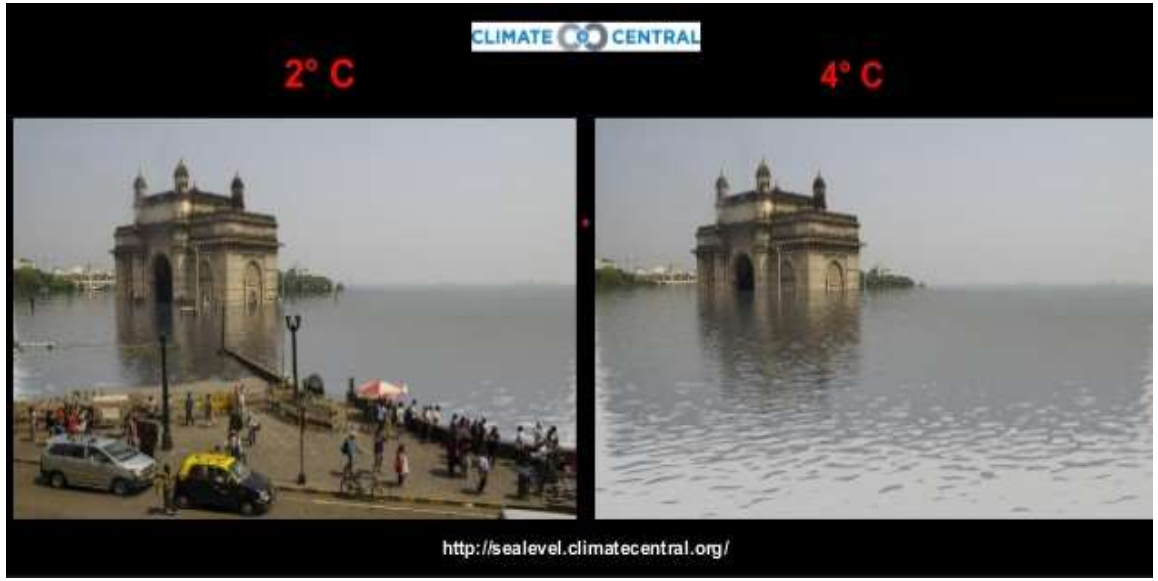


Structural solutions alone don't help

2011: Mumbai's Municipal Corporation (BMC) commissioned **8 pumping stations along with 58 other projects.**
Today, **only 5 pumping stations are operational,** and less than 30 of the planned flood protection projects are complete.

2015: BMC spent USD 29 million to build a new pumping station. **The city still faces floods every year.**

The **Maharashtra State Action Plan on Climate Change** identified that BMC needs to integrate climate adaptation strategies into its policy decisions to reduce flood impacts.

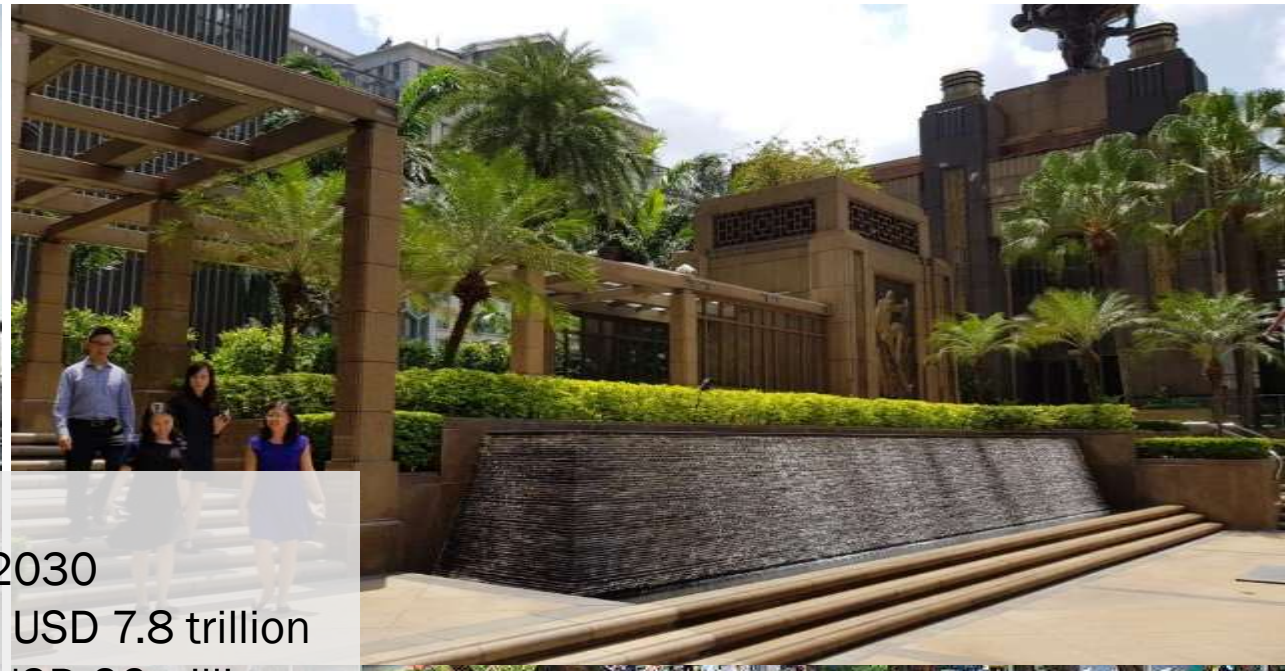


Predicted consequences of 2°C and 4°C warming on Mumbai

Natural river drainage system reduced to <**50% of its original flow**

Rampant urban development along Mithi river, on mangroves, wetlands, salt pan lands and flood plains **destroyed natural flood buffers.**

Huge challenge or huge opportunity?



By 2030
Latin America: USD 7.8 trillion
Asia-Pacific: USD 26 trillion

60% of the world infrastructure we'll see by 2030 is yet to be built

Mainstreaming climate resilience into spatial planning: an internationally recommended approach

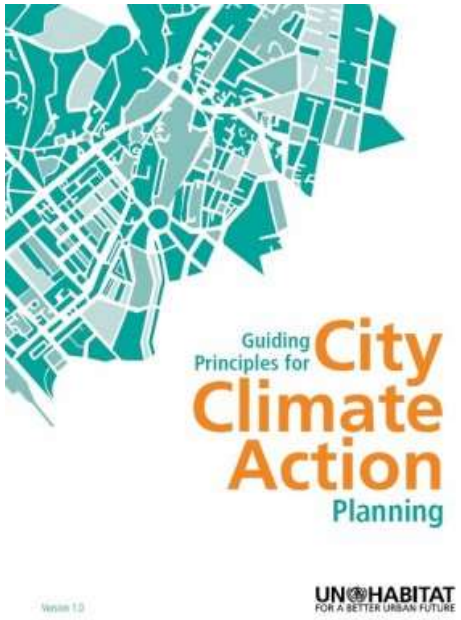
The *New Urban Agenda (NUA)* links environmentally sustainable and resilient urban development to planning and urban spatial development management: **paragraphs 72, 77, 80, 81, 93, 94, 95, 96, 98, 99, 102, 111, 113, and 117**

17 PARTNERSHIPS FOR THE GOALS

SDG 17 stresses the importance **South-South and triangular cooperation**

COP23 FIJI
UN CLIMATE CHANGE CONFERENCE
BONN 2017

Alejandro Iza, Director of the Environmental Law Centre, stated at the COP 23: "***As the impacts of climate change gradually increase, there is a need to provide effective tools to ensure the integrity of ecosystems and livelihoods… Land use planning should be one of these tools***"



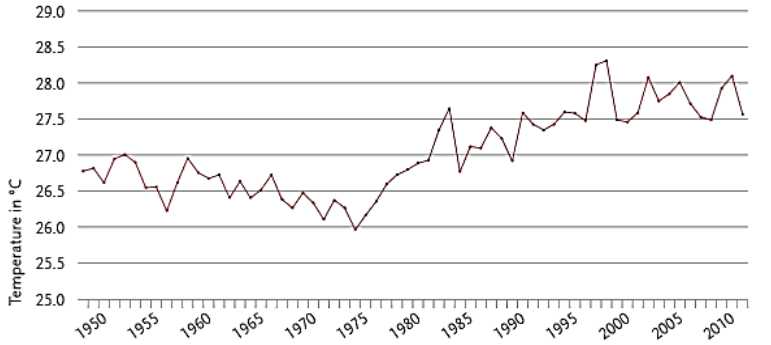
Guiding Principles for City Climate Action Planning, UN HABITAT: urban climate action integrated into long-term urban planning processes increases the effectiveness of adaptation strategies

Climate resilience through spatial planning: National policies in Asia

Holistic approach and strict land use regulations: Singapore

Population: 5.6 million

Climate challenges:



Temperature rise from **26.6°C** to **27.7°C** in 42 yrs

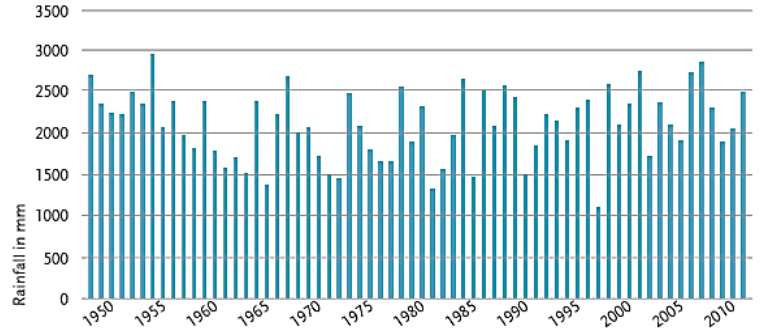
Town planning legislated in 1959

Dedicated planning body – Urban Redevelopment Authority – established in 1974

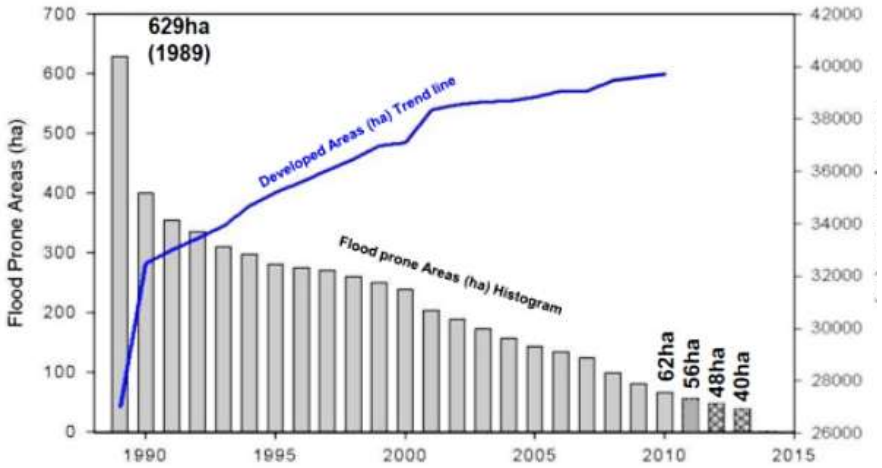
All spatial plans and regulations integrate ecological urbanism and green strategies to achieve climate resilience since 1960s

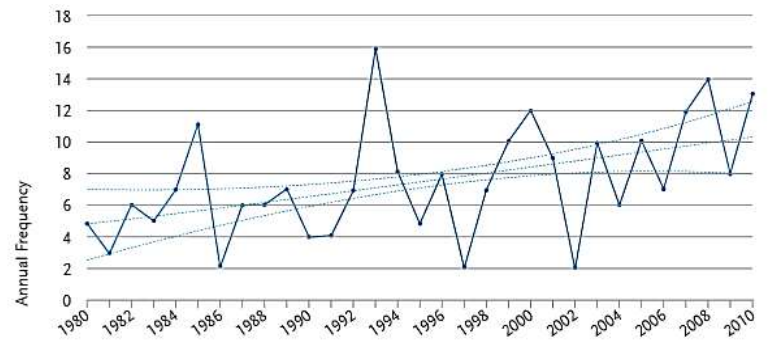
Singapore is ranked 1st in ND-GAIN climate adaptation readiness index

- **Concept Plan** - integrated land use and transportation plan to guide city's development for 40 to 50 years, reviewed every 10 years
- **Green and blue spaces** - nature reserves, parks and open spaces - protected and augmented



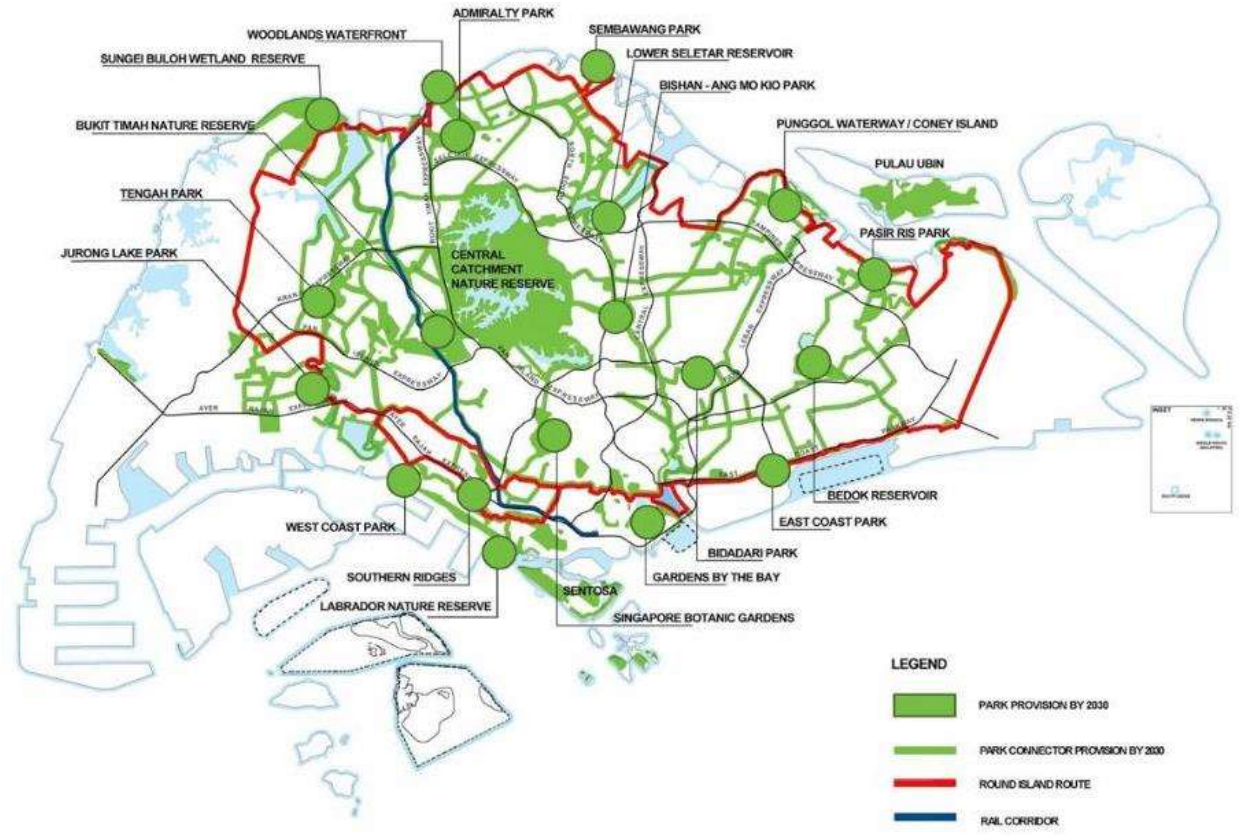
Rainfall rise from **2192mm** to **2727mm** in 34 yrs





Annual frequency of days with heavier rainfall

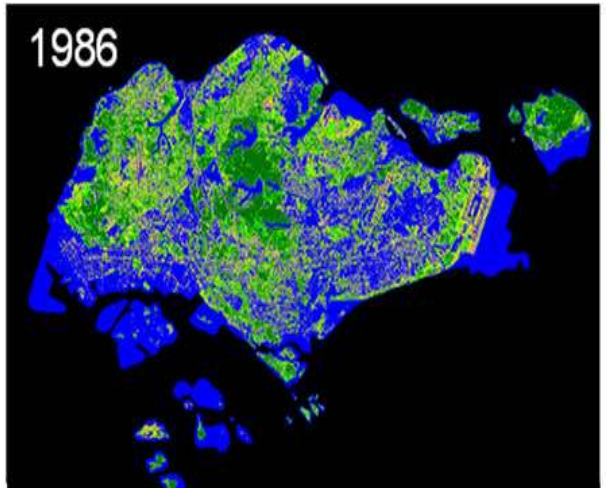
Sea level rise from **1.2mm** to **1.7mm** in 34 yrs

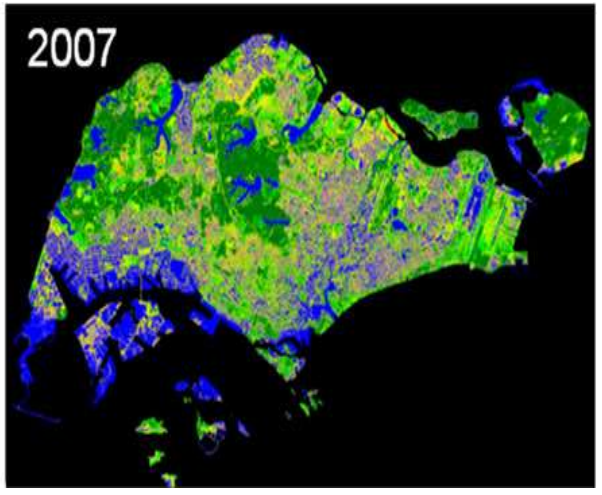


Singapore's green and blue spaces – land use plan 2030.

Restored natural river in Bishan park, permeable surfaces, shaded streets, green and blue spaces, TOD

flood prone area reduced from 3,178 ha in 1970s to only 34 ha in 2013





The green increased from 36% in the 1980s to 47% now

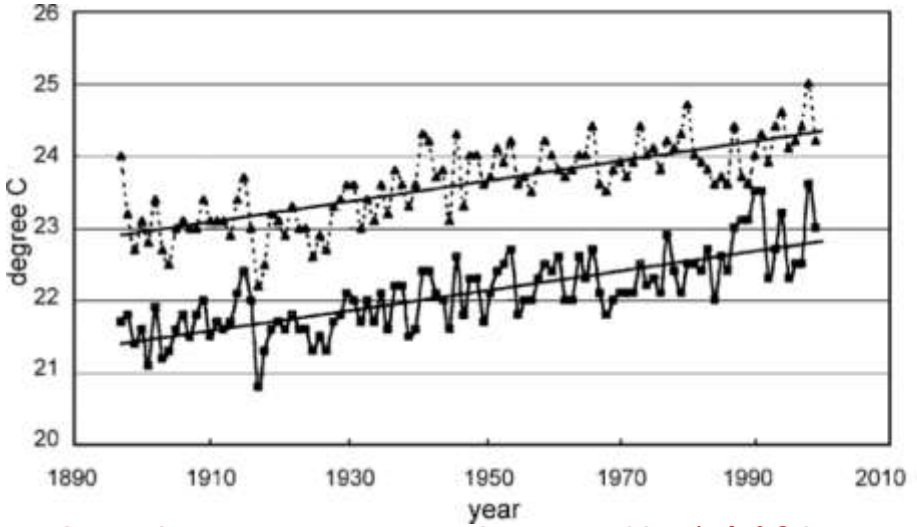
Specific program examples:

Active, Beautiful, Clean Waters (ABC Waters) program	Landscaping for Urban Spaces and High-rises (LUSH) program
Green Mark Rating scheme	Ecosystem based adaptation

Integrating spatial planning into the national climate action program: Taiwan

Population: 23.5 million

Climate challenges:



Annual mean temperature increased by 1.4 °C between 1911 and 2009.

New Taipei's **Climate Action Plan** (2015) – **initial outcomes**:

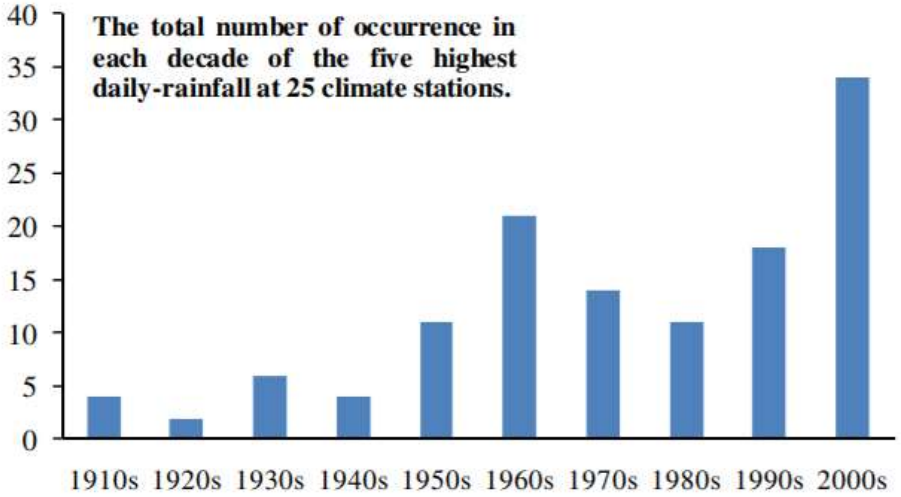
The city is cleaner: in 2018 New Taipei named cleanest city in Taiwan for the 7th consecutive year

The waste volume has decreased: the annual waste volume of New Taipei reduced from 108.48 tons to 34,19 tons from 2013 to 2016.

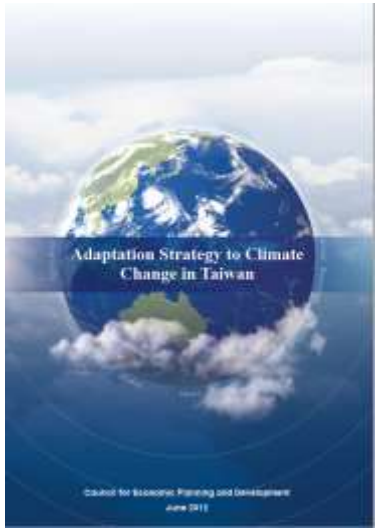
Energy saved: electricity saving rate in New Taipei reached 1.24% in 2015.

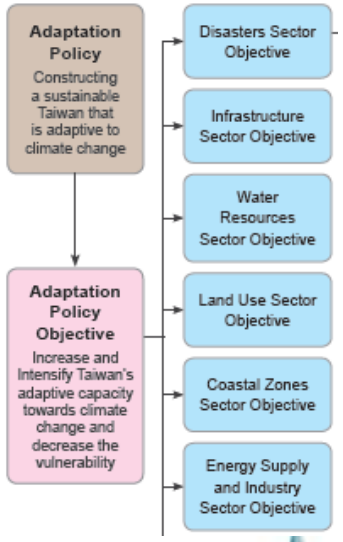
Smart Transport: Share of citizens using public transportation increased from 25% to 34% in 2103-2016.

Ecosystems conservation: Freshwater conservation areas (blue belt) with woodlands and grasslands (green belt) demarcated



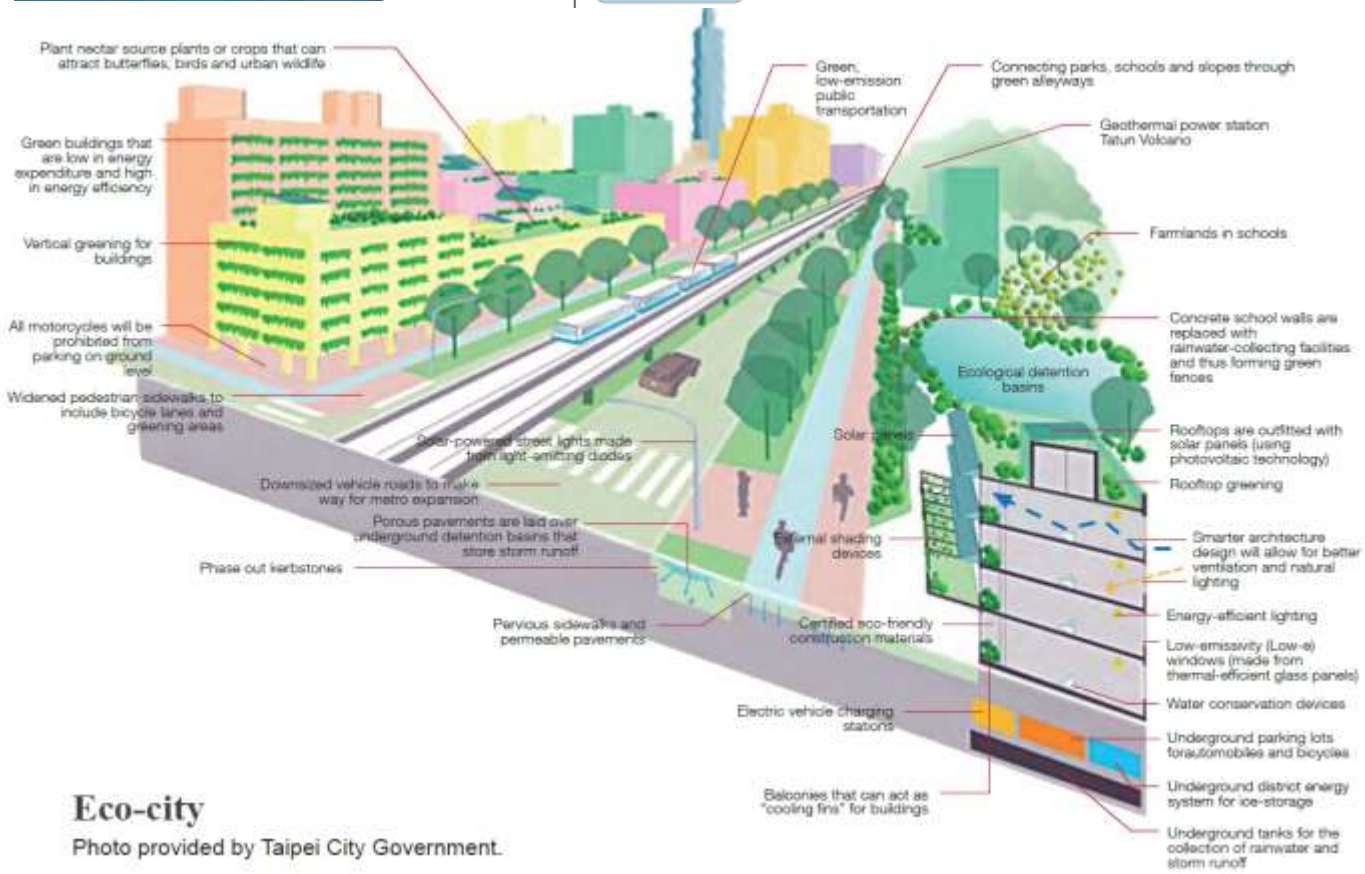
From 1993 to 2003, the sea level rose by 5.7 mm/yr, twice the rising rate over the past 50 years





Spatial planning adaptation strategies:

- **Legislating and revising national spatial plans** in response to climate change
- Incorporating **Environmentally Sensitive Area** into the delineation and management of national conservation areas.



Eco-city

Photo provided by Taipei City Government.

Taiwan's **Adaptation Strategy to Climate Change in Taiwan** (2012) focuses on **non-structural interventions:**

Detention ponds:

- Increased vegetation to counter UHI, flood control, green public spaces

Wetland Ecological Corridor:

- Water conservation, flood control, biodiversity, recreation

Green Roofs

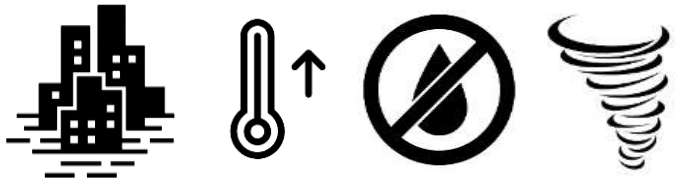
- Reduce UHI, cleaner air

The 2015 typhoon Soudelor, comparable to typhoon Morakot (2009) in intensity, generated 10 times less deaths and USD 3.84 billion in damages.

Successful inter-ministerial cooperation: Philippines

Population: 106.5 million

Climate challenges:

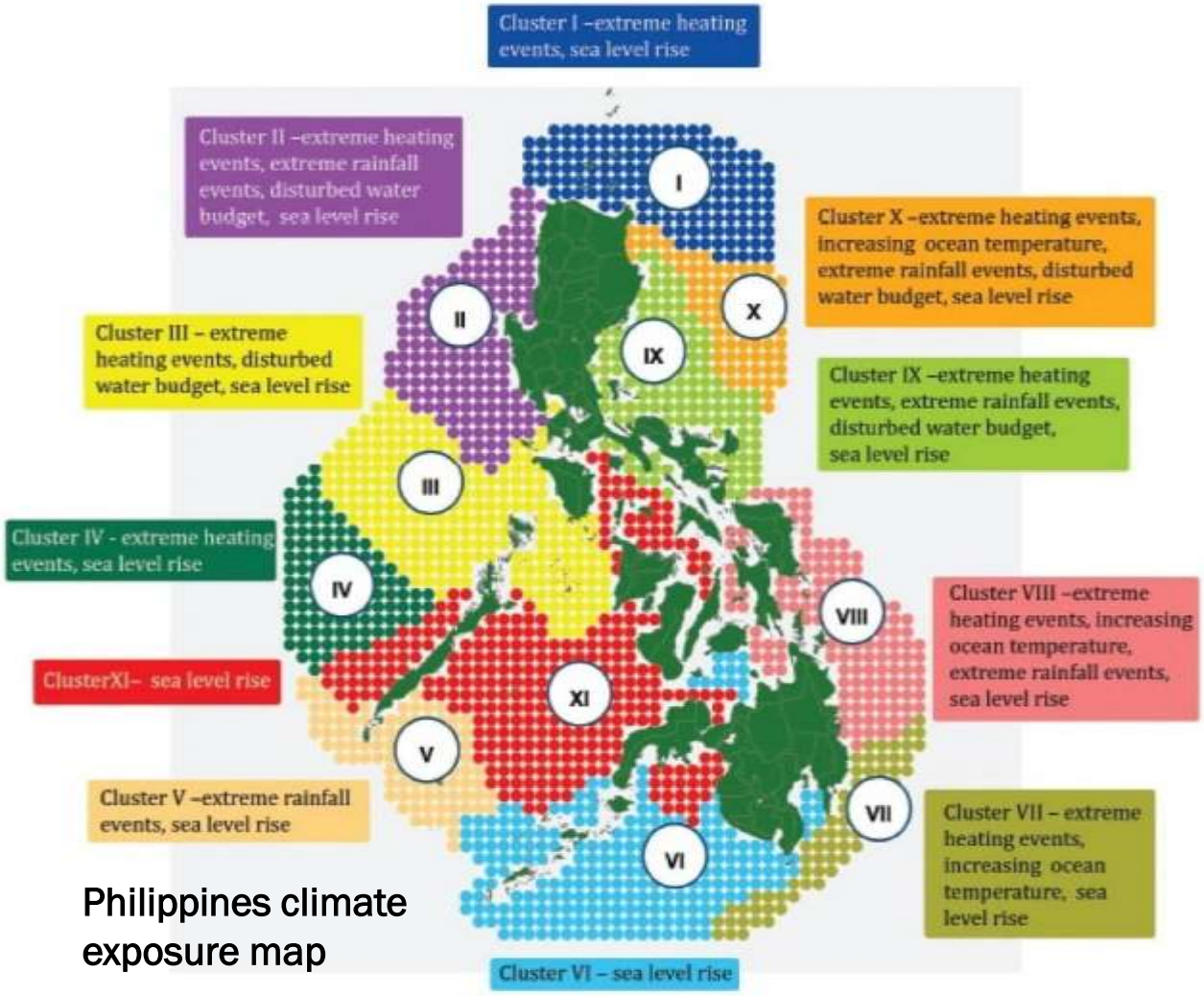


Albay:

- **Forest Cover** increased by **7.5%** in 2006-15
- Increase in **mangrove reforestation**: 1700 acre during 2009-13 (3x mangrove forests)
- Integration of **DRR-CCA** into educational curriculum
- **Malaria-free** in **2008** and **Filarias-free in 2012**
- **No casualties in subsequent typhoons**

Before

After



Philippines climate exposure map

7 of the 25 world cities most exposed to a 1-meter sea-level rise by 2050 are in Philippines

The Philippines is hit by an average of 20 typhoons every year

Albay model of **land use regulatory zoning ordinances** developed after Albay super typhoon (2006) with over 2500 causalities.

Albay 2007 & Manila 2009

Revisions for Zoning Ordinances

The Philippine Disaster Risk Reduction and Management Act of 2010

The Climate Change Act of 2009

Housing and Land Use Regulatory Board (HLURB)

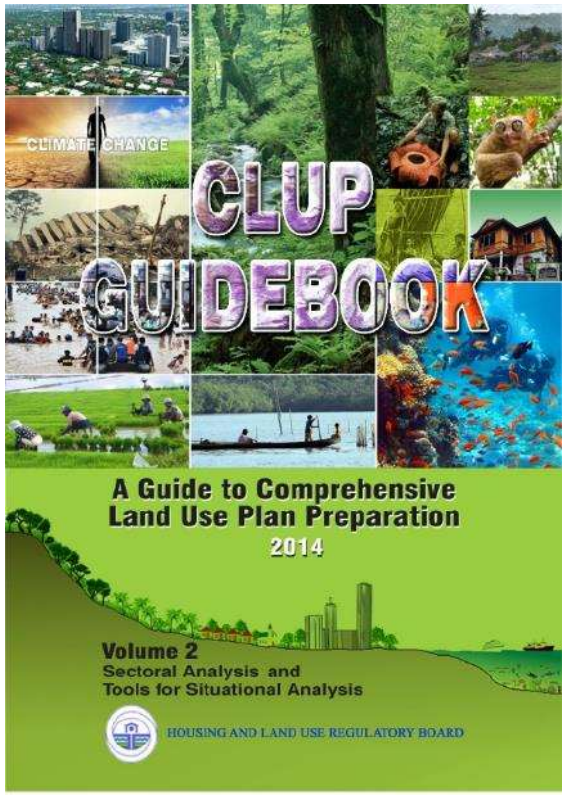
National Climate Change Commission (NCCC) –guidelines for CCA in CLUP, 2015

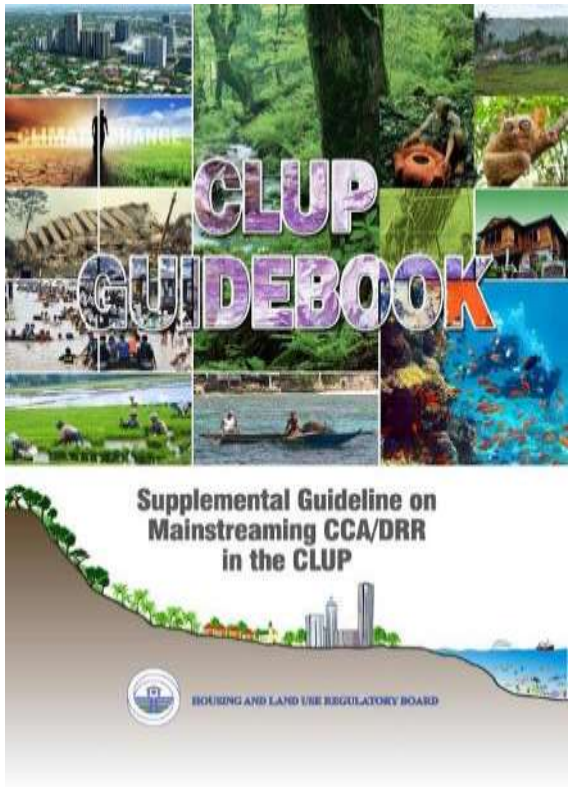
Comprehensive Land Use Plan

Plans need to be submitted to HLURB for funds' allocation

National Level Laws/Acts

Enactment at National Level by **Climate Change Commission** as coordinating committee





Before

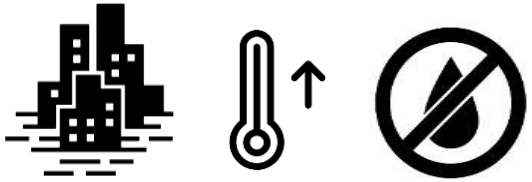
After

Climate resilience through spatial planning: City level policies in Latin America

Plan 4C – Competitive and Climate Compatible Cartagena

Population: nearly 1 million

Climate challenges:



UNESCO **World Heritage Site** 1984, most visited city in Colombia

Economic activities: **Tourism, commercial, industries and port: 90% of the regional GDP**

Urban flooding and risk to heritage sites

70%
Areas of mangrove swamps under threat of flooding

100%
Beaches under threat of erosion

86%
Historic heritage at risk of flooding

28%
Industries under threat

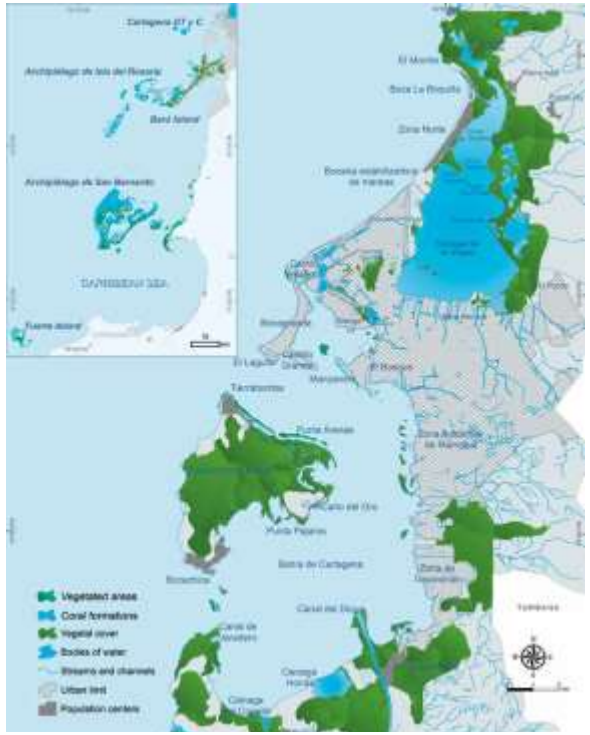
35%
Road infrastructure at risk of flooding

26%
Houses under threat of flooding

Plan 4C – Competitive and Climate Compatible Cartagena

First coastal city in Columbia to create **long-term vision for climate resilient development.** Key principles:

- Ecosystem-based adaptation
- Climate compatible ports and industries;
- Tourism sector committed to climate change;
- Protection of historic heritage;
- Neighbourhoods adapted to climate change;



Natural green and blue axes plan of the Cartagena de Indias district.

Greener historic center and buffer areas with reduced emissions

Protection of assets of cultural interest from climate change

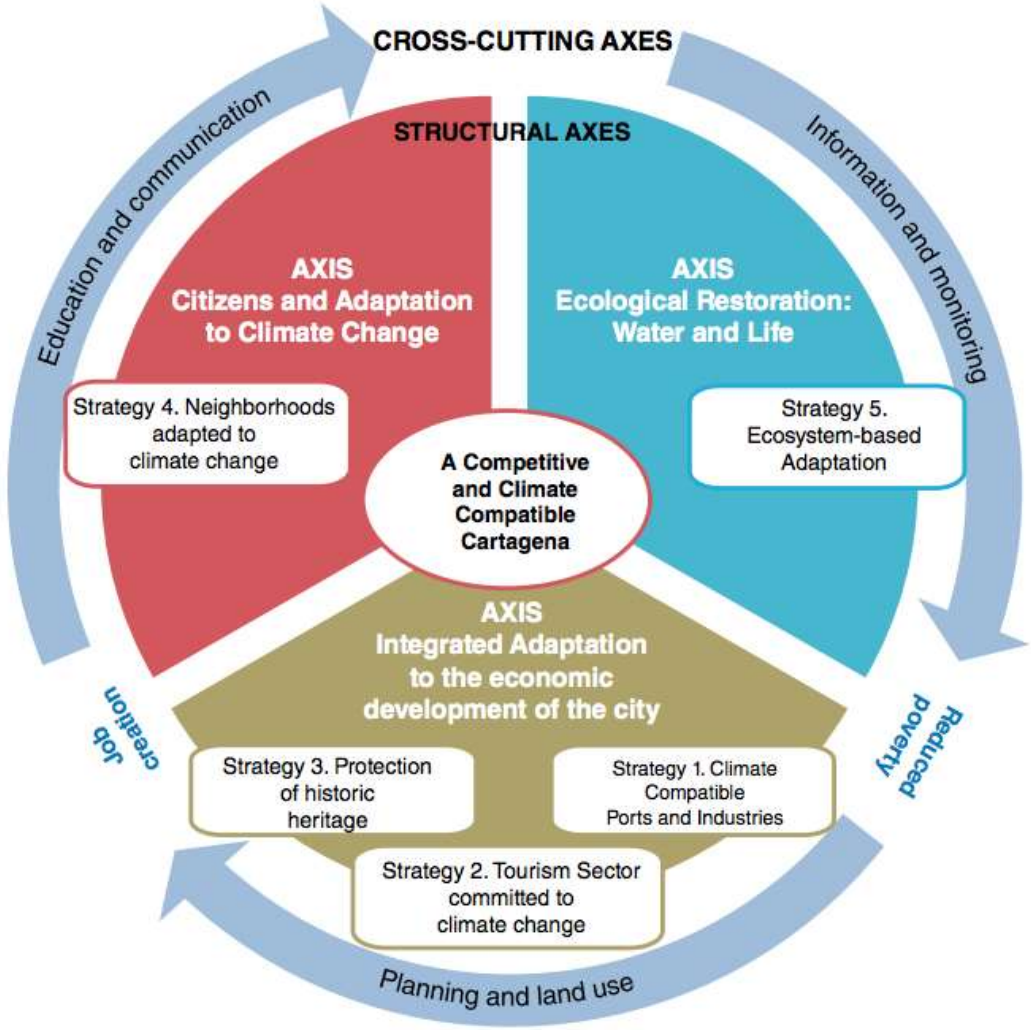
Resilient ecosystems

Promotion of ecosystem based adaptation and urban planning

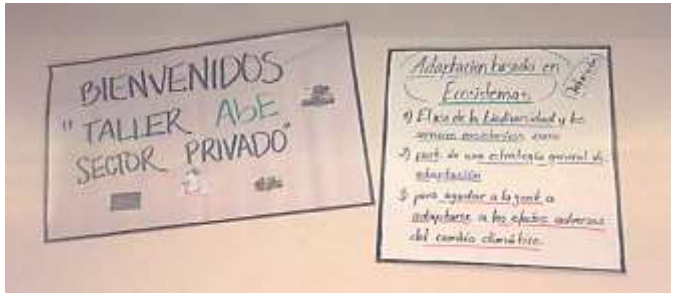
Mangroves protection

Plan 4C-comprehensive local level climate action plan adopted in 2009

Cartagena Competitiva y Compatible con el Clima



Axes and strategies identified for future development of a Climate Compatible Cartagena



Workshop with business owners in June 2018 discussing tools for tackling climate change in business management, reduce performance risks and vulnerability of communities.

Climate Action Center for Cartagena (CACC)

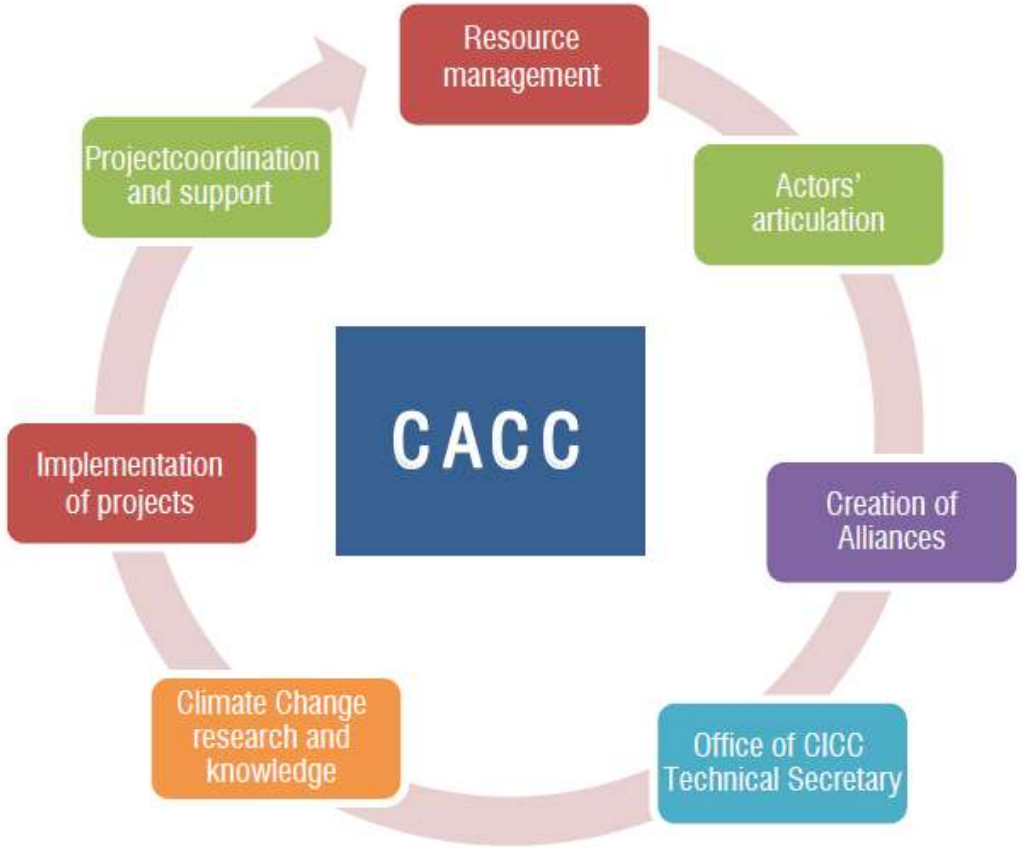
Institution formed to coordinate actions of the different actors mentioned throughout the Plan

Ensuring that each of them assumes that role and carries out the actions which are stipulated in it.

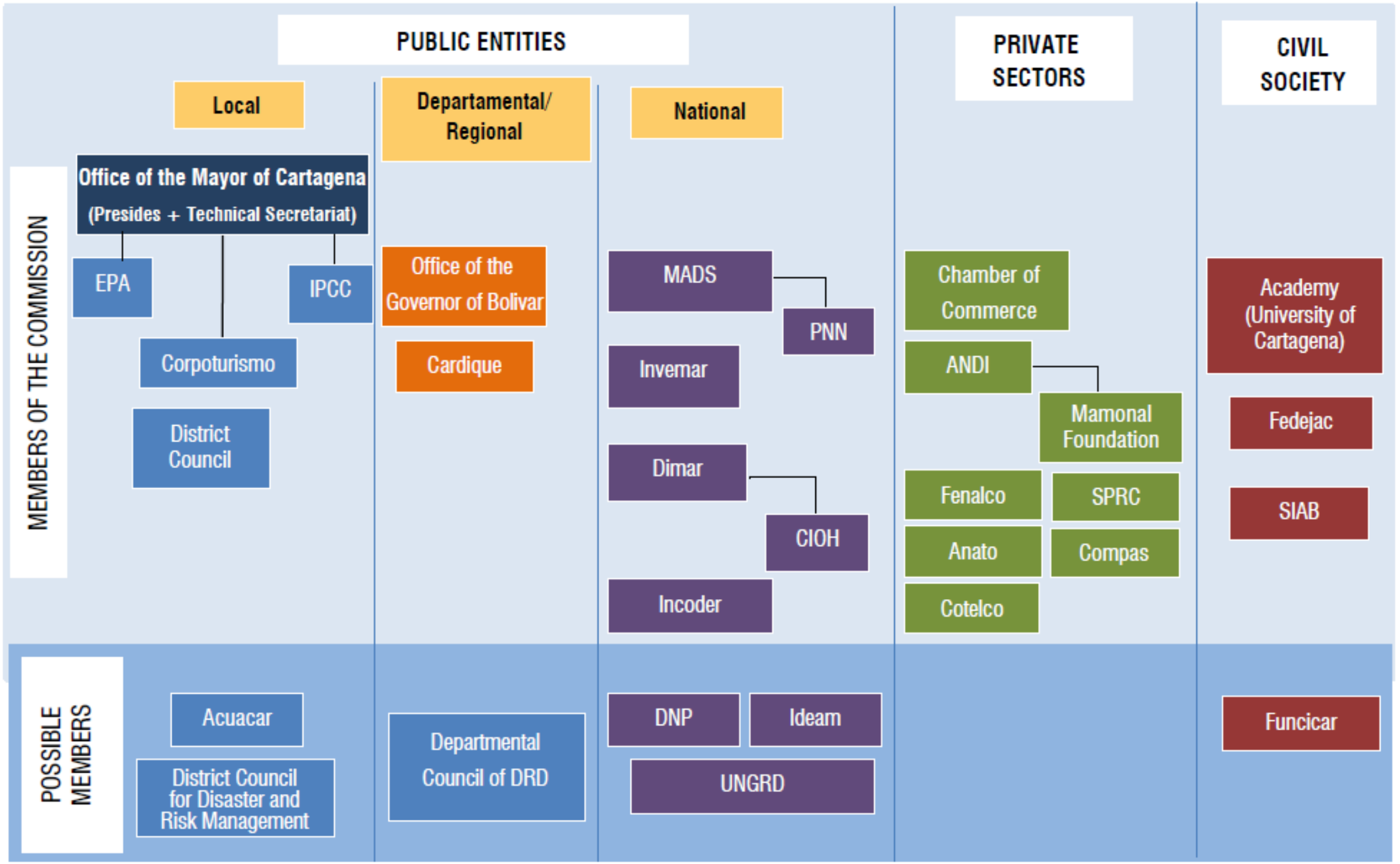
Example of involvement of private sector:

- Hotels to implement guidelines to reduce carbon and water footprint
- Sharing of good practices at different levels
- Waste water practices to clean up mangroves

Operational structure
Climate Action Center for Cartagena



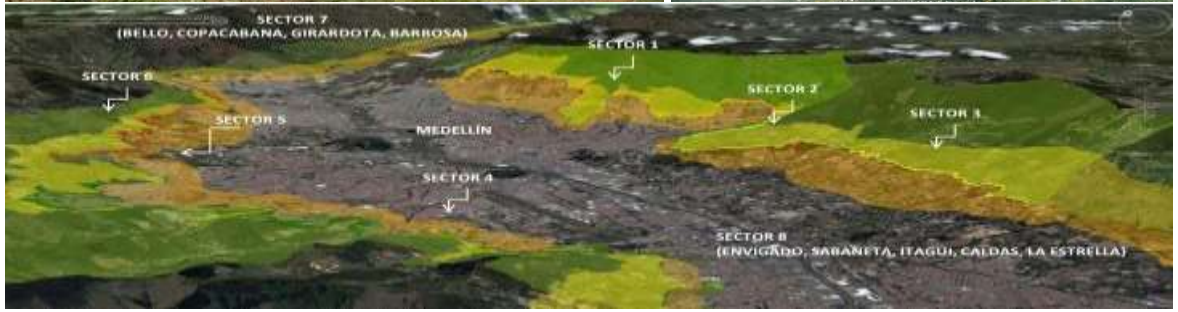
Actors of the Inter-Institutional Commission of Climate Change for Cartagena de Indias



Mainstreaming Climate Resilience into Local Spatial Planning

Medellin, Colombia: Green Belt plan, 2012

1. '**protection zone**' preserves natural hillside ecosystems;
2.'**transition zone**' includes new parks, bike paths and risk management infrastructure;
3. '**consolidation zone**,' re-conquers the valley with new parks, multi-family housing and multi-modal transportation networks.



Recife, Brazil: Municipal Green Roof Law (18.112/15), 2014

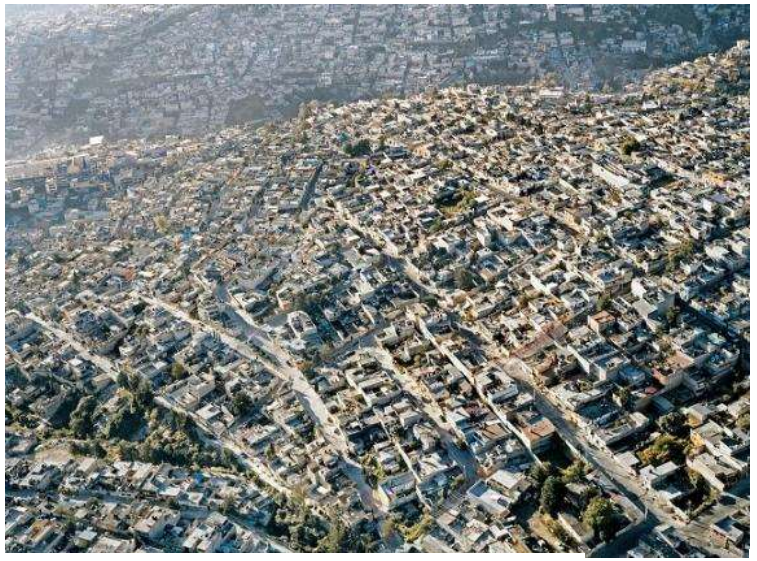
Roofs of buildings over 4 floors and commercial buildings >400 m2 to be covered with **native vegetation**.

Green Building Certification Scheme (2016) for rainwater capture, energy efficiency, sustainable design, and use of recyclable materials in buildings

Urban sprawl and concrete jungle urban development model for the Global South?

Learning from developed cities in Latin America – urban sprawl model?

Latin America's cities most unequal on the planet: 1/5 inhabitants live in slums.



Mexico city: urban sprawl

Caracas: urban sprawl

over 70% of water used returns to rivers with no treatment across LAC

73% of Lima complains about traffic congestion

Mexico city: urban floods, 2017

Latin America 50% urbanised in 1960

Asia 50% urbanised in 2018

Urban sprawl and concrete jungle: an aspiration?

Sao Paulo

Population: 22 million

Urban sprawl: explosive suburban growth – from 200,000 to 8,4 million people since 1950

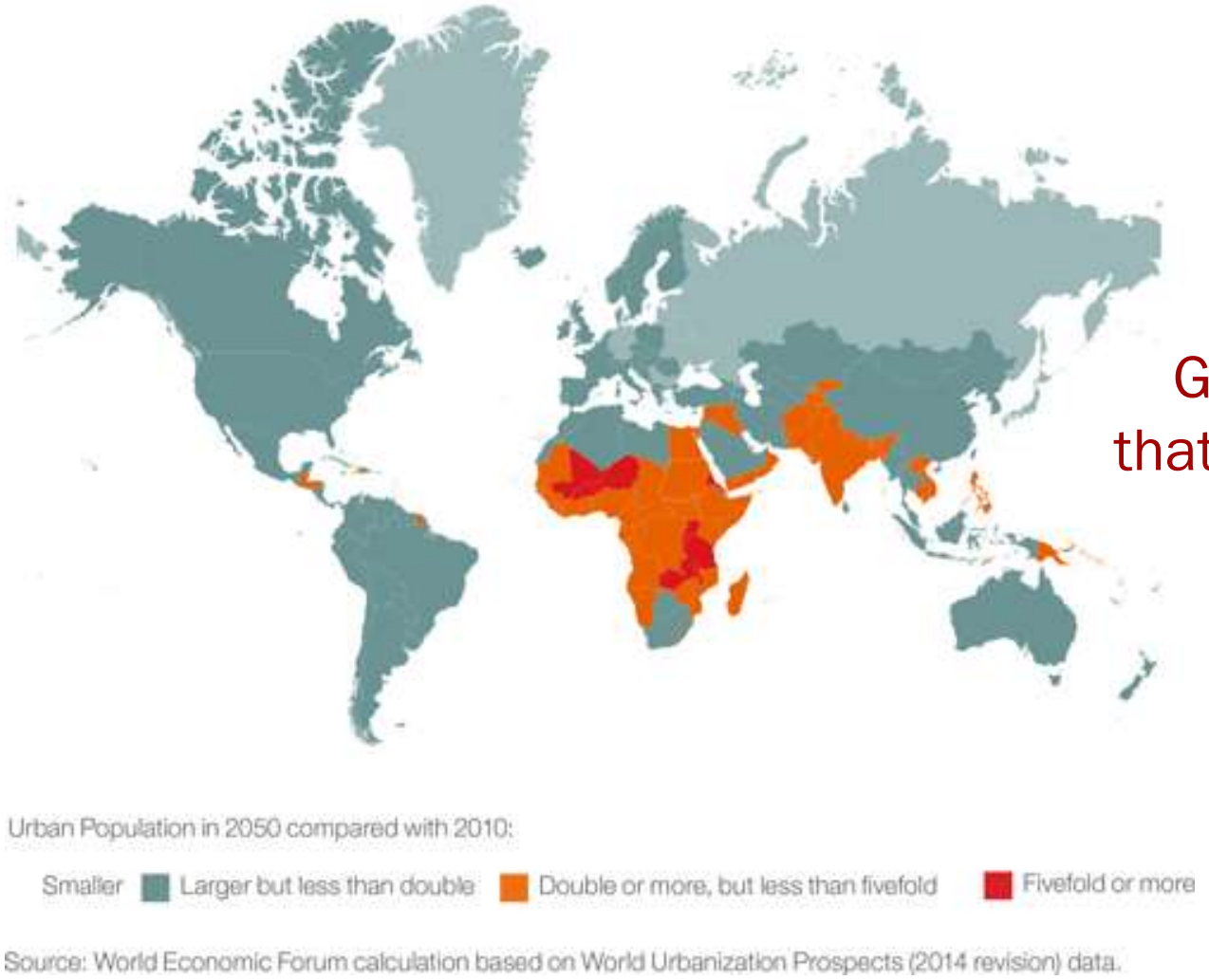
Green coverage:

- loss of 53km2 between 1990 and 2000
- 2.6 m2 green space per capita (WHO recommends 9m2)

Water stress: amongst **top 10 cities likely to run out of water** (deforestation and increased concrete/ asphalt surfaces)

Air pollution: **5000 premature deaths** and **US$15.1 billion losses** annually

Forecasted urban population growth 2010-2050



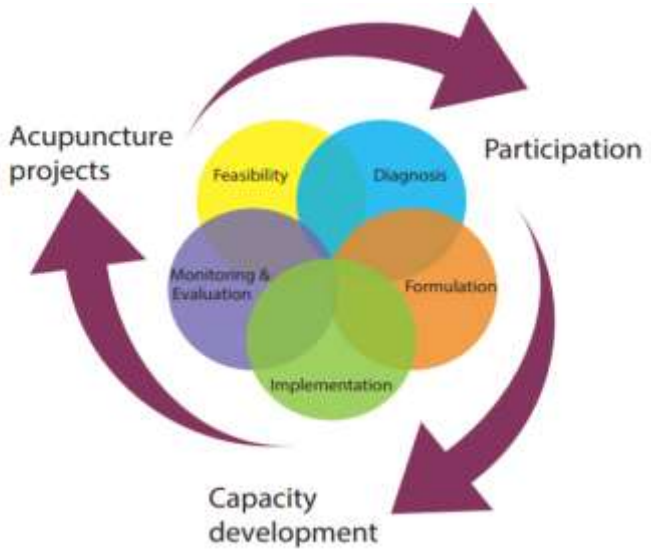
Source: World Economic Forum calculation based on World Urbanization Prospects (2014 revision) data.

Governments to take critical decisions that will determine the future of their cities for decades

Annual infrastructure investments till 2030 (ADB)
Developing Asia: $1.7 trillion
Africa $130-170 billion

Conclusions

1. National policies are key to leverage on spatial planning for climate resilience



UN-Habitat National Urban Policy process to mainstream climate resilience into spatial planning

2. Local leadership can transform the city.

Mayor Aníbal Gaviria of Medellin announced the construction of 46 mile long Metropolitan Green Belt (Jardin Circunvalar) in 2012.

Enrique Peñalosa, Mayor of Bogotá, shifted city's policy from car oriented to transit oriented in late 1990s.

4. Learning from grown cities to take the right decisions

3. Multi stakeholder engagement, simplified administrative hierarchies and adequate distribution of responsibilities

Thank you

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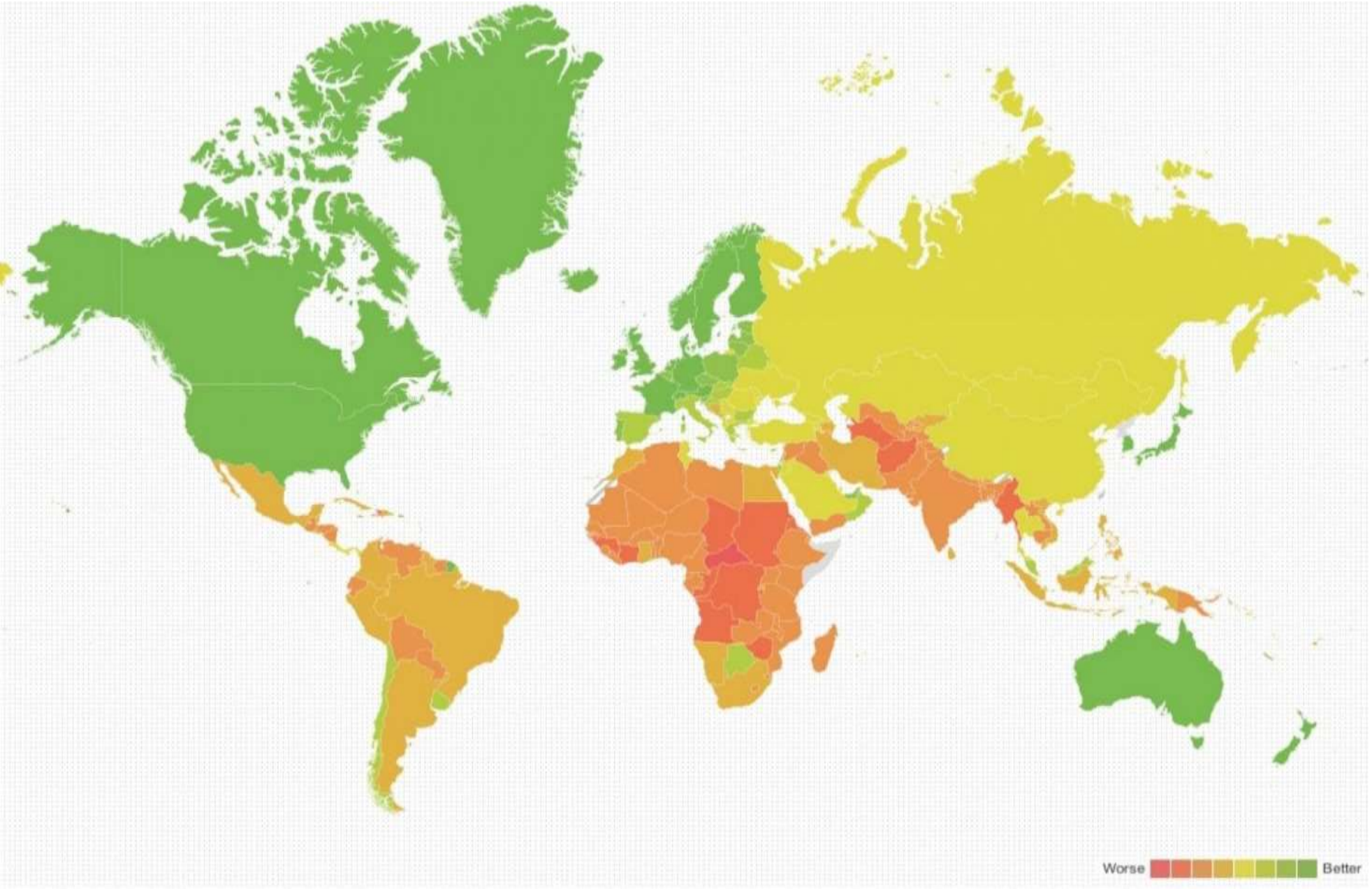
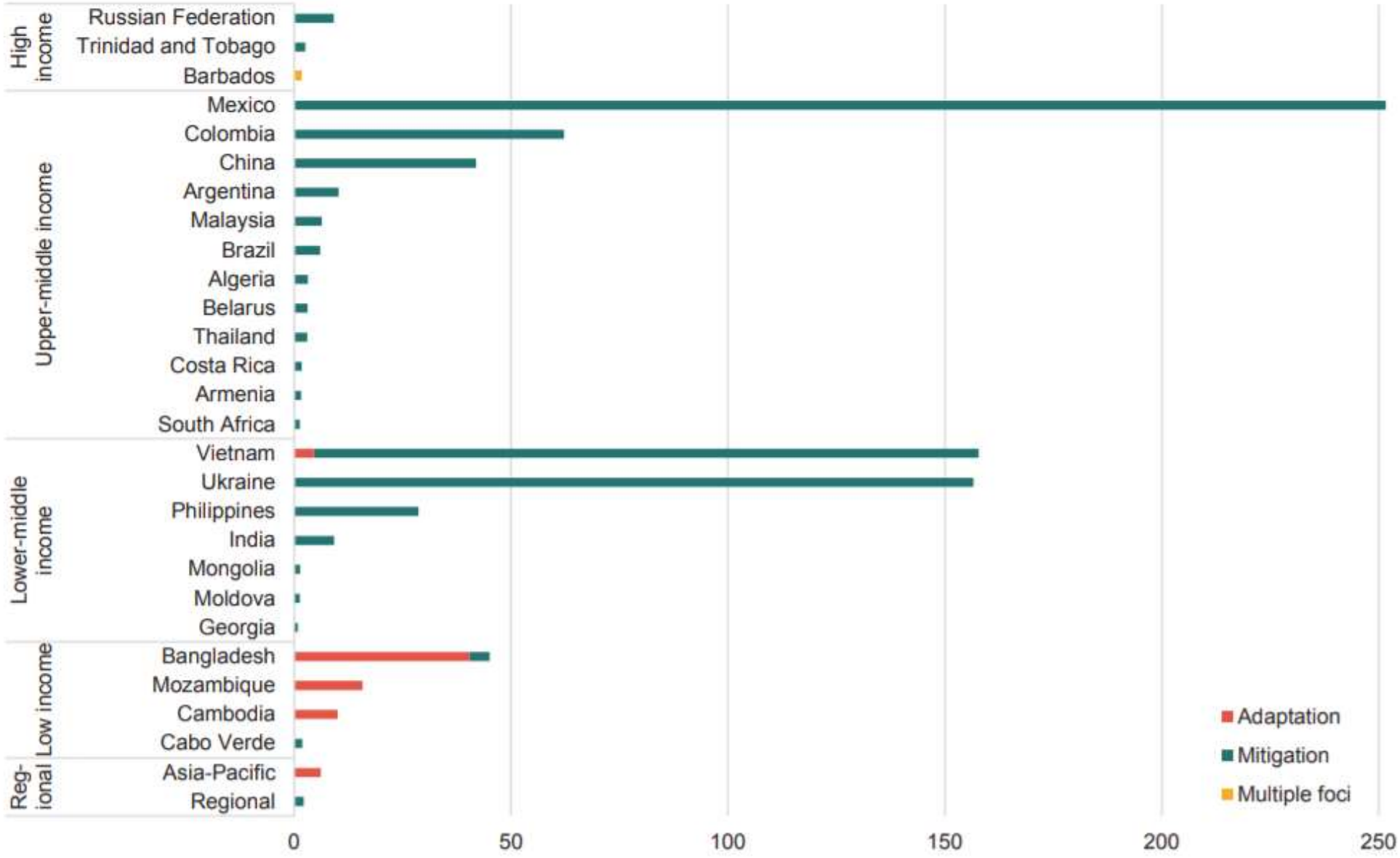
Notre Dame Global Adaptation Index- Climate Change Readiness map



ND-GAIN Readiness measures a country's ability to leverage investments and convert them to adaptation actions.

Global South is least ready for climate adaptation.



Climate finance approved for explicitly urban projects 2010-14, by country and income level (in USD millions)