



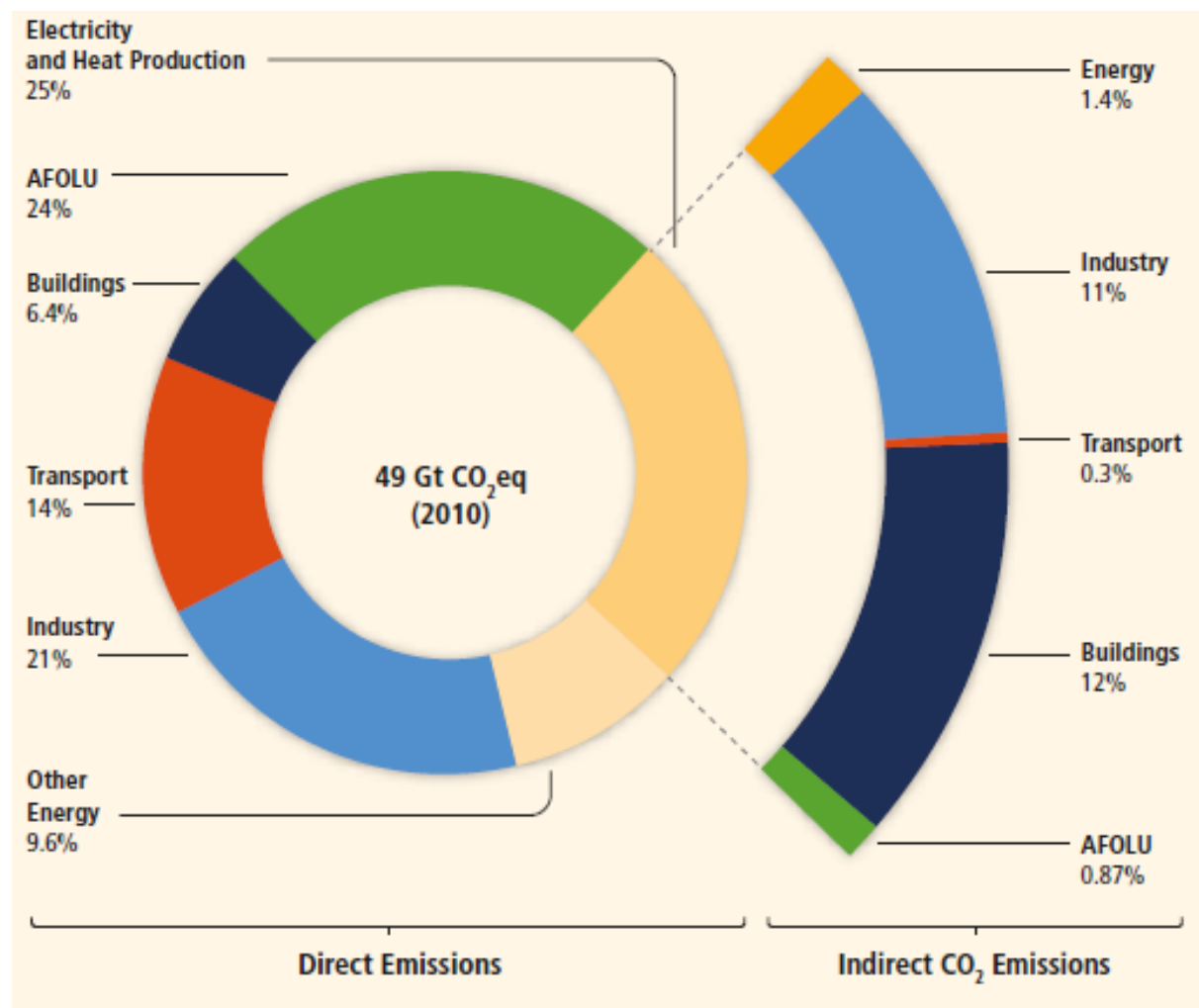
**Session 1 - Introduction International
policies on climate change**

Outline of Session

- 1. Understanding Climate Change**
- 2. Climate Change and Cities**
- 3. Climate Change Impacts on cities**
- 4. What can cities do? The practice of climate change adaptation and mitigation in cities**
- 5. Approaches to Climate Change Planning**
- 6. Summary and Conclusions**

1. Understanding Climate Change

Greenhouse Gas emissions by Economic sector

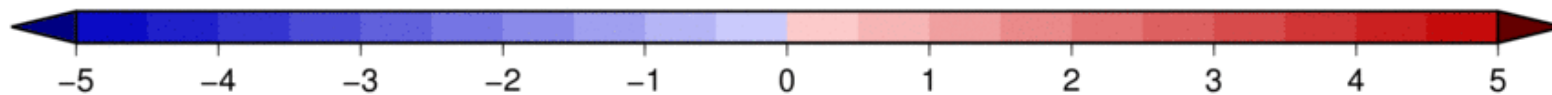
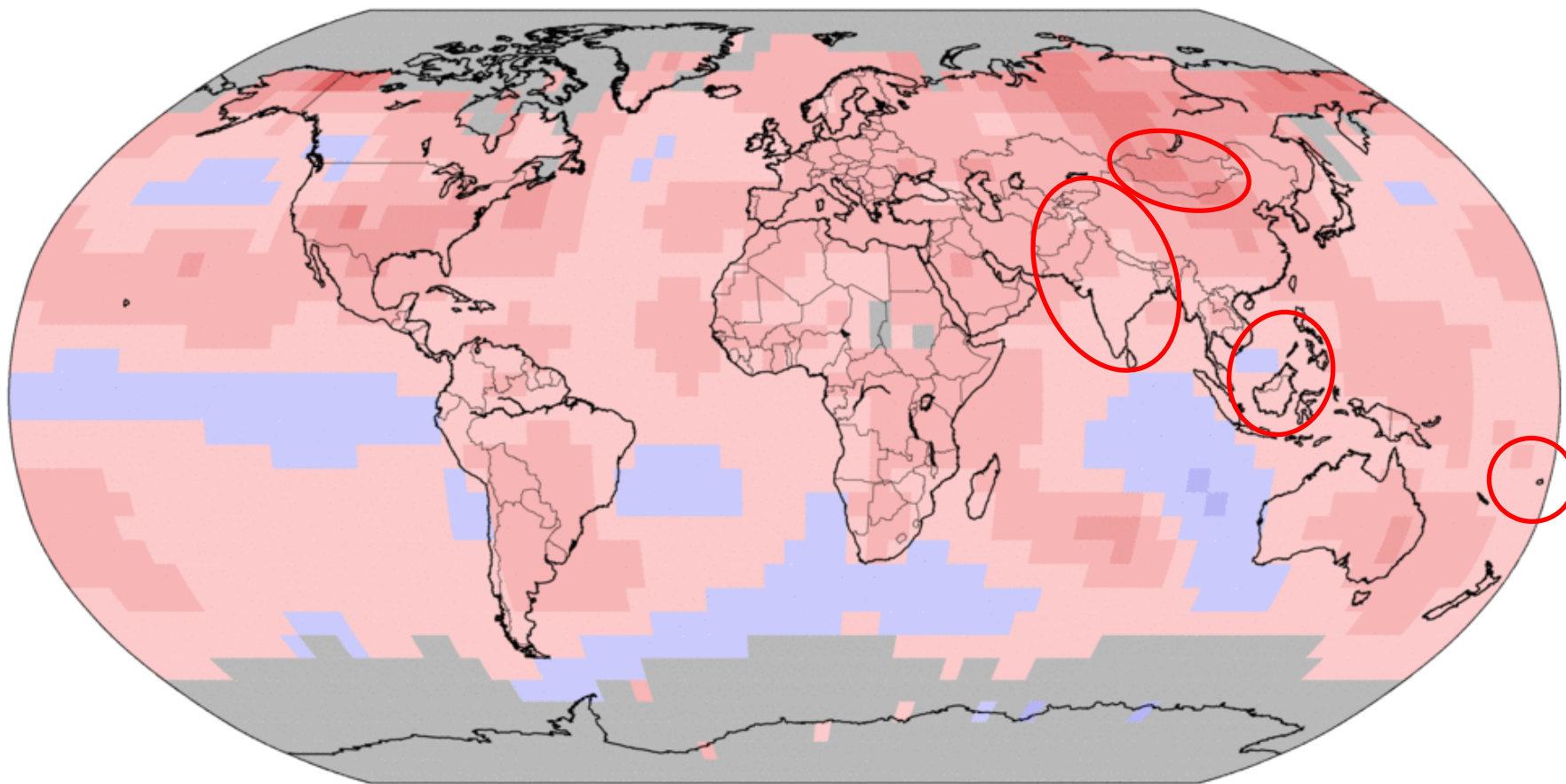


Source: IPCC 2014.

Land & Ocean Temperature Departure from Average Jan–Dec 2017

(with respect to a 1981–2010 base period)

Data Source: GHCN–M version 3.3.0 & ERSST version 4.0.0



National Centers for Environmental Information
Tue Jan 16 07:02:18 EST 2018

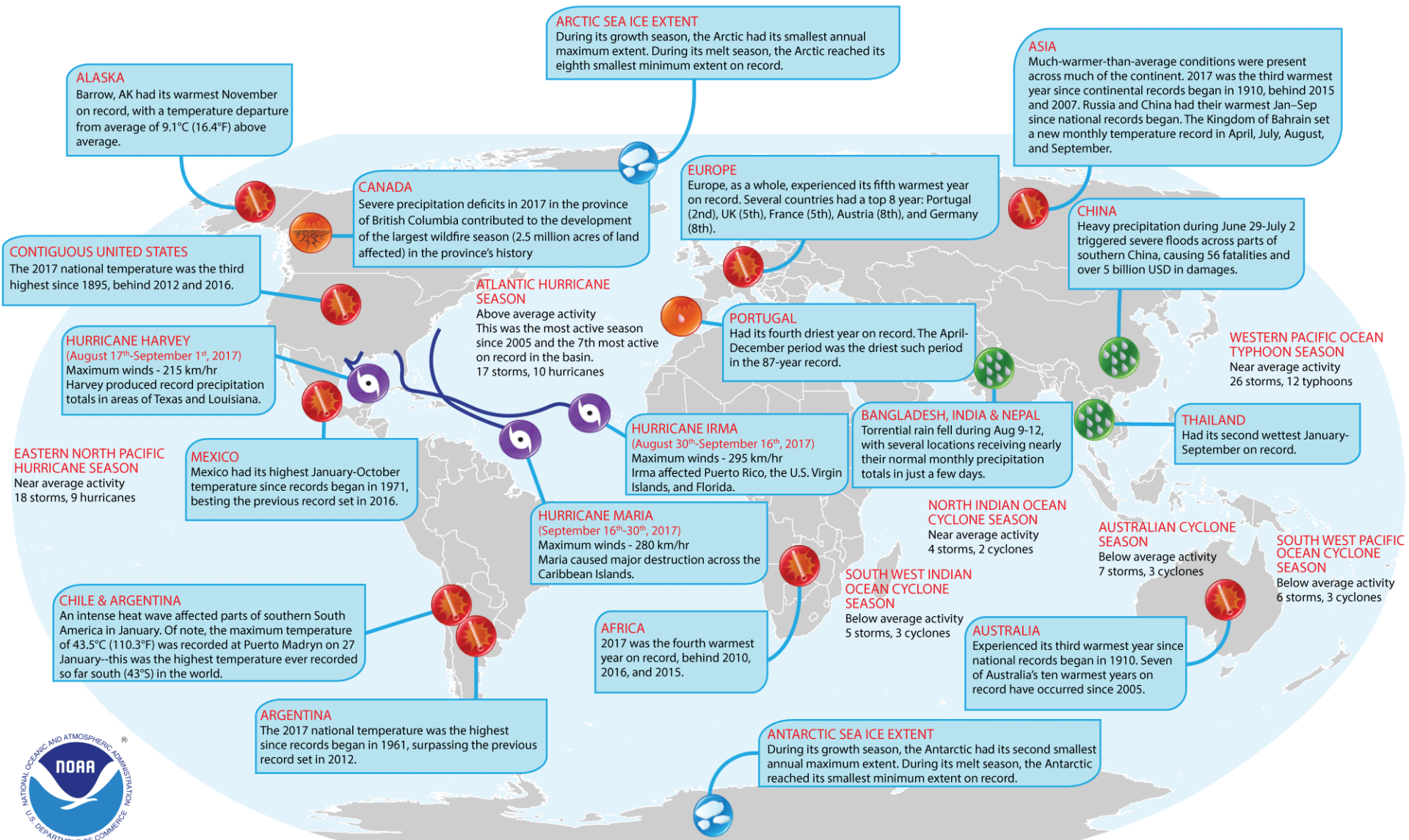
Degrees Celsius

Please Note: Gray areas represent missing data
Map Projection: Robinson

Global Warming / Climate Change

- The average **global surface temperature** for 2017 was 0,84°C above the 20th century.
- These observations are confirmed by:
 - Rising sea levels
 - Warming Oceans
 - Desertification
 - Heat Waves
 - Decreases of river and lake ice seasons
 - Reduction in glacial mass
 - More intense and frequent storms

Selected Significant Climate Anomalies and Events in 2017



Please Note: Material provided in this map was compiled from NOAA's NCEI State of the Climate Reports and the WMO Provisional Status of the Climate in 2017. For more information please visit: <http://www.ncdc.noaa.gov/sotc>

2. Climate Change and Cities?



Cities' contribution to climate change

The global built-up area is set to triple by 2030 (Angel et al. 2005)



Phnom Penh's , Cambodia© Holly Robertson

Cities' contribution to climate change

An aerial night photograph of a city, likely Colombo, Sri Lanka. The image shows a dense urban landscape with numerous buildings, some brightly lit. A large harbor area is visible in the upper left, with several ships docked and industrial structures along the waterfront. The city lights reflect on the water, creating a vibrant scene. The overall tone is blue and white, typical of night photography with artificial lighting.

Urban areas account for between 71% and 76% of CO₂ emissions from global final energy use and between 67 – 76% of global energy use (IPCC 2014)

Colombo, Sri Lanka © <http://aaholidays.com/package/amazing-sri-lanka/>

Cities' contribution to climate change

- Cities are large economies that emit greenhouse gas proportional to:
 - Their level of economic output
 - The energy sources they use
- 37% and 49% of global GHG emissions use that quote also (IPCC 2014).



Dhaka, Bangladesh, January 4, 2017 © GreenTransitNews



Eastern, Saudi Arabia, July 11, 2017 © Al Arabiya

Cities' contribution to climate change



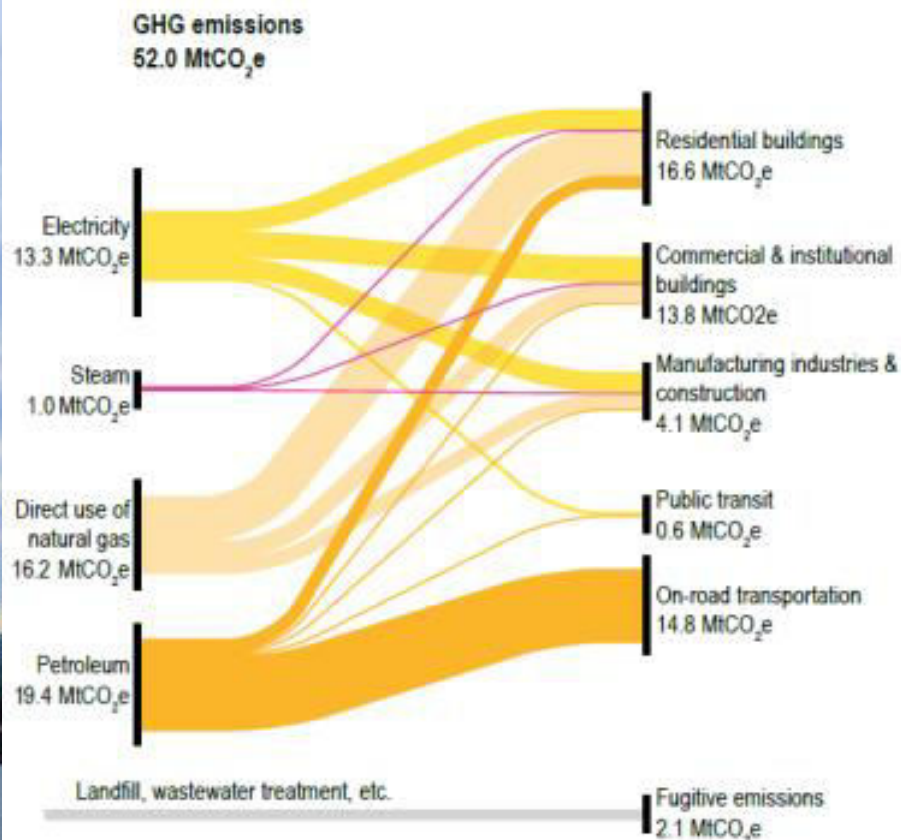
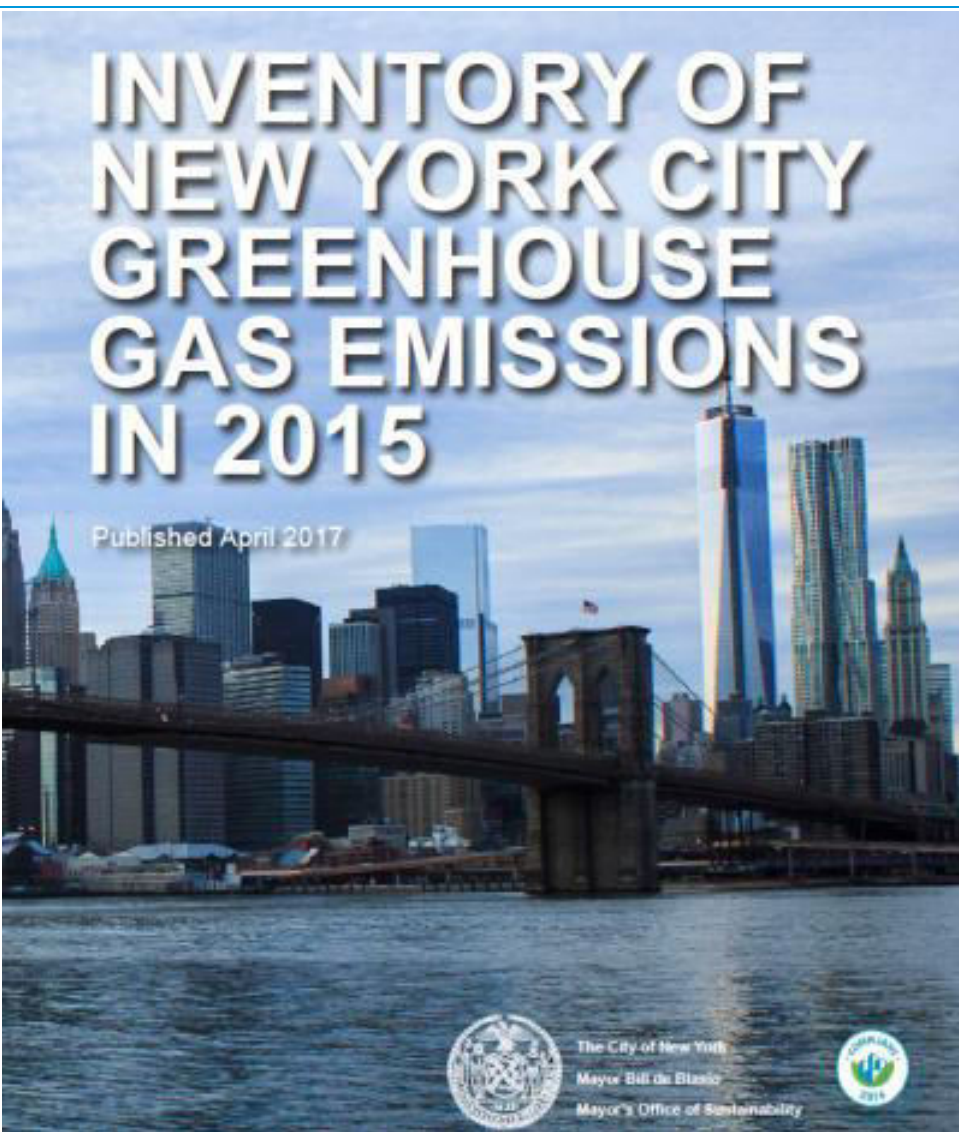
Kuala Lumpur, Malaysia

Cities' contribution to climate change

Population (Millions)	GHG Emissions (M tCO ₂ e)	GDP (billion \$ PPP)
1. China: 1,192	1. USA: 7,107	1. USA: 14,204
2. India: 916	2. China: 4,058	2. 50 Largest Cities: 9,564
3. 50 Largest Cities: 500	3. 50 Largest Cities: 2,606	3. C40 Cities: 8,781
4. C40 Cities: 393	4. C40 Cities: 2,364	4. China: 7,903
5. USA: 301	5. Russian Federation: 2,193	5. Japan: 4,354
6. Indonesia: 190	6. Japan: 1,374	6. Top 10 GHG Cities: 4,313
7. Brazil: 159	7. Top 10 GHG Cities: 1,367	7. India: 3,388
8. Russian Federation: 142	8. India: 1,214	8. Germany: 2,925
9. Top 10 GHG Cities: 136	9. Germany: 956	9. Russian Federation: 2,288
10. Japan: 128	10. Canada: 747	10. United Kingdom: 2,176

Source: The World Bank 2010: 18.

Cities' contribution to climate change



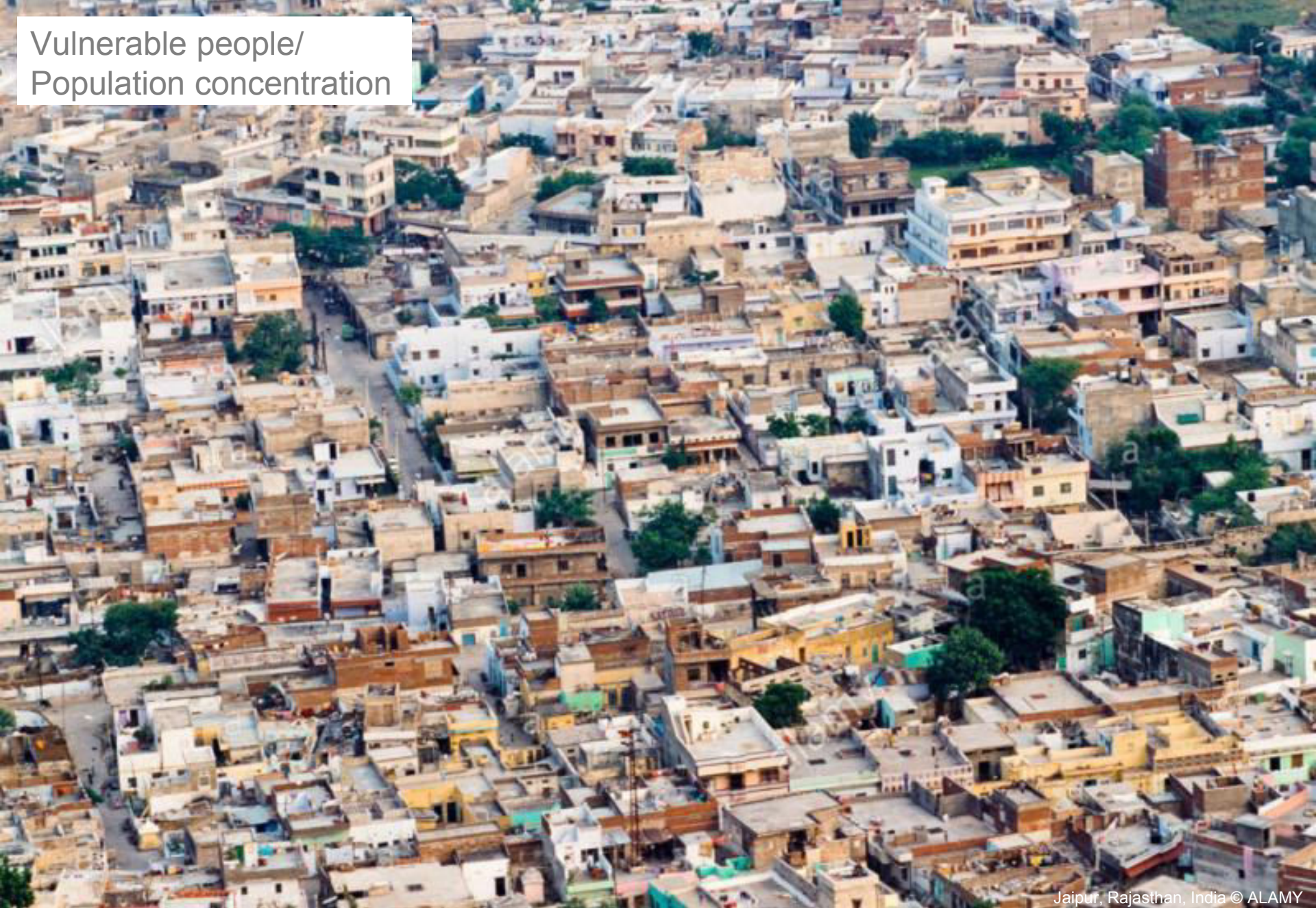
Source: NYC Mayor's Office

3. Climate Change Impacts on cities

Climate change impacts

“The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects” (IPCC 2014)

Vulnerable people/
Population concentration



Jaipur, Rajasthan, India © ALAMY



Kuala Lumpur Airport © http://www.klia.com.my/?m=business&c=business_about&id=17

Socio economic infrastructure
is concentrated in cities



Ras tanura Saudi Arabia Oil Refinery Aerial View, Saudi Arabia © ALAMY

Regional variation of impacts

- The impacts of climate change will not be experienced equally across different parts of the world
- Within any one region, some systems, species and people will be more able to absorb climate change impacts than others
- Asian region is one of the most vulnerable regions due to multiple stresses, already difficult climate and low adaptive capacity
- Coastal areas, such as highly populated delta regions in Southeast Asia, are at great risk due to flooding from the sea and from rivers
- Small islands are especially vulnerable to sea level rise and extreme weather events.

Climate change impacts on urban areas

Change in climate	Possible impact on urban areas
Changes in means	
Temperature	Increased energy demands for heating/cooling Worsening of air quality Exaggerated by urban heat islands
Precipitation	Increased risk of flooding Increased risk of landslides Distress migration from rural areas Interruption of food supply networks
Sea-level rise	Coastal flooding Reduced income from agriculture and tourism Salinisation of water sources

Source: Dodman and Satterthwaite 2008
(adapted from Wilbanks et al. 2007).

Climate change impacts on urban areas

Changes in extremes

Extreme rainfall

More intense flooding
Higher risk of landslides
Disruption to livelihoods and city economies
Damage to homes and businesses

Drought

Water shortages
Higher food prices
Disruption of hydro-electricity
Distress migration from rural areas

Heat- or cold-waves

Short-term increase in energy demands for heating/cooling

Abrupt climate change

Possible significant impacts from rapid and extreme sea-level rise
Possible significant impacts from rapid and extreme temperature change

Changes in exposure

Population movements

Movements from stressed rural habitats

Biological changes

Extended vector habitats

Source: Dodman and Satterthwaite 2008
(adapted from Wilbanks et al. 2007).



Climatic impacts on cities:
Drought-affected areas,
Indonesia, July 2008

Photo courtesy of [Greenpeace Southeast Asia](#)



Climatic impacts on cities:
Heatwave, Northern
Thailand, Apr 28, 2016

Climatic impacts on cities: Dust storm and heatwave, Allahabad, India. April 12, 2016



Allahabad, India© RITESH SHUKLA/NURPHOTO/AP

Climatic impacts on cities:
Wildfire, Jakarta, Indonesia,
Sept. 2, 2015.



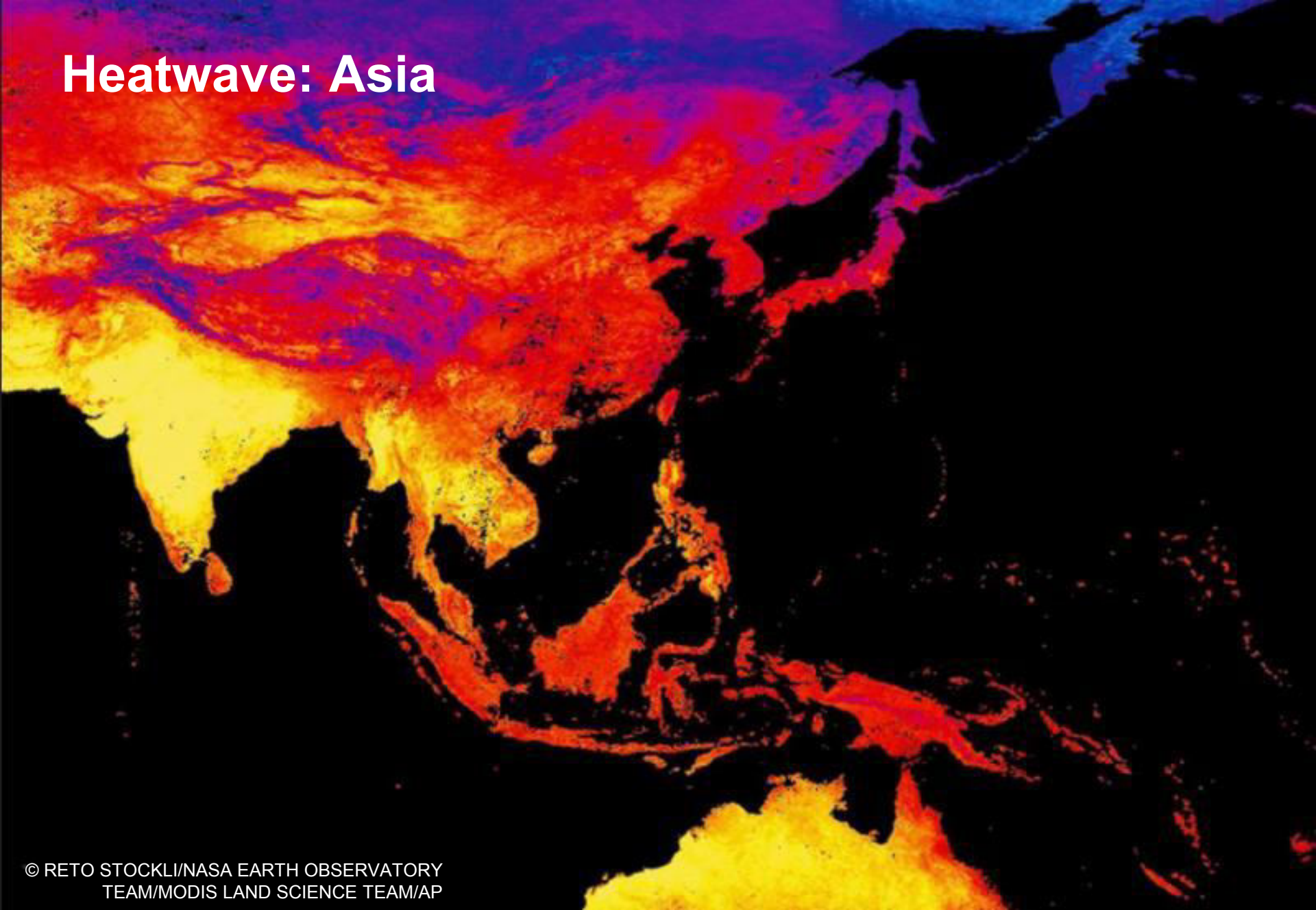
Jakarta, Indonesia© Photo by Xinhua/Zulkarnain via Getty Images



Climatic impacts on cities: smoke from peat fires, Pekanbaru, Riau province, Indonesia, March, 2014.

Pekanbaru, Indonesia© Rony Muharrman/AP

Heatwave: Asia



© RETO STOCKLI/NASA EARTH OBSERVATORY
TEAM/MODIS LAND SCIENCE TEAM/AP

WATER



Climatic impacts on cities: Heavy rain and flash floods in Asakura City, Japan, July 2017

Asakura City in Fukuoka, Japan© Agence France-Presse

Climate hazard: drought-
water-scarcity Kerala,
India. April, 2017



Kerala, India© FWD Media



Climatic impacts on cities:
floods and landslides, Sri
Lanka. May 29, 2017

Sri Lanka© Editor

Climatic impacts on cities: devastating floods and displaces across South Asia by monsoon, Janakpur, Nepal. Aug 13, 2017



Janakpur, Nepal@ Reuters/Navesh Chitrakar

Climatic impacts on cities: tsunami-like waves and savage winds flattened entire communities in the Philippines following Super Typhoon Haiyan. Nov 9, 2013



Philippines @ Raul Banias

Climatic impacts on cities: strong winds as Typhoon Haiyan hit the city of Legaspi, Albay province, south of Manila. Nov 8, 2013



Philippines @ Charism Sayat / AFP Photo

Climatic impacts on cities:
storm surge flooding by rising
sea level, Kuala Lumpur,
Malaysia. Feb 13, 2014



Philippines @ Flickr/EU Humanitarian Aid and Civil Protection

Cities' contribution to climate change – Health

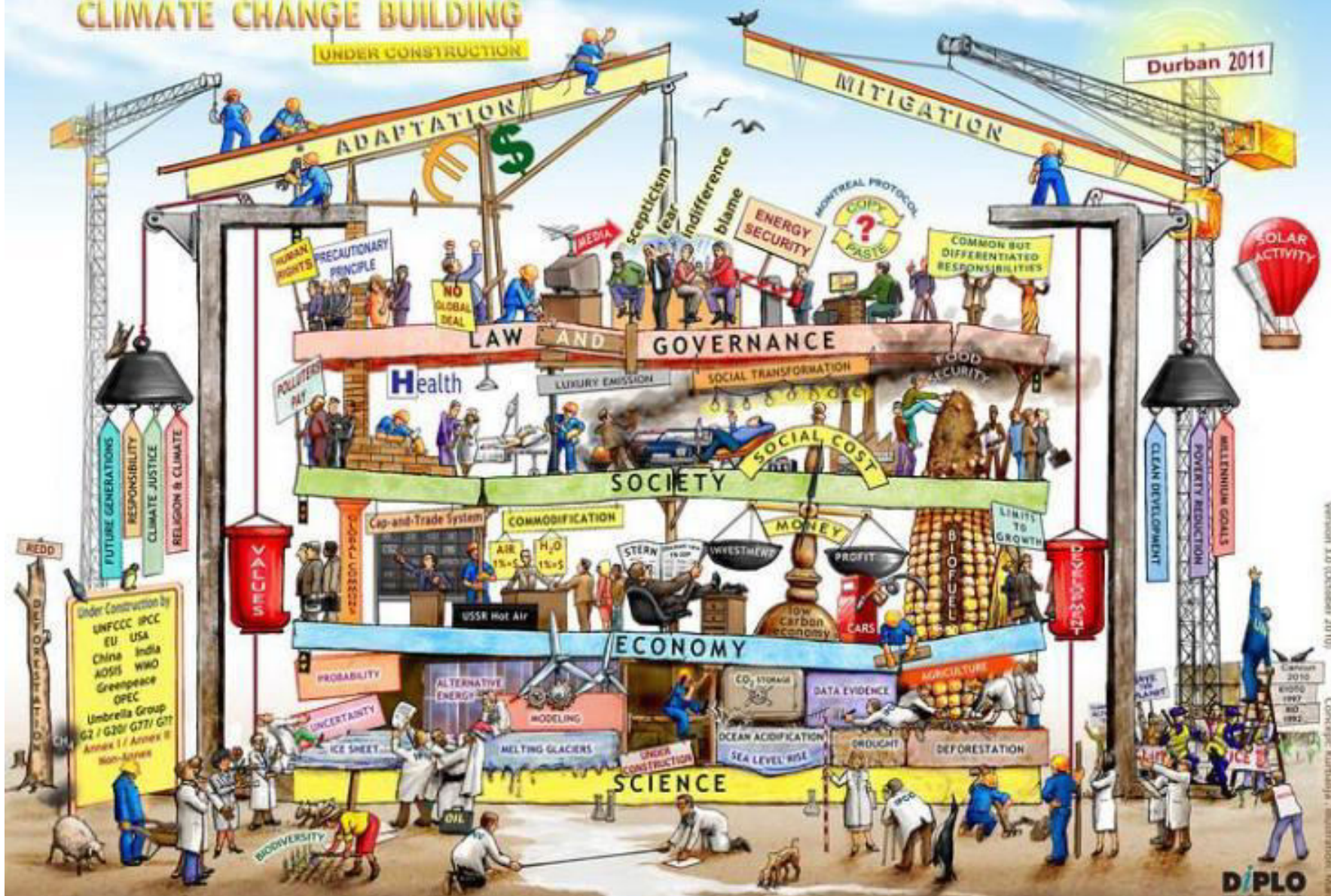
- CC could alter the ecology of disease vectors.
- Dense informal settlements are most at risk on the urban heat island phenomenon.
- Urban heat waves will cause many more deaths than in the past.
- Soaring urban temperatures - Deterioration of ambient air quality by favoring formation of various air pollutants and their precursors such as tropospheric ozone and nitrogen oxide. These pollutants put people at additional risk of respiratory disease and other health problems.



Saudi Arabia © Photo [Faisal Al Nasser/REUTERS](#)

CLIMATE CHANGE BUILDING

UNDER CONSTRUCTION



This drawing illustrates Diplo's approach to training and research on climate change.

Creative Commons by DiploFoundation

Diplo Foundation (2012)

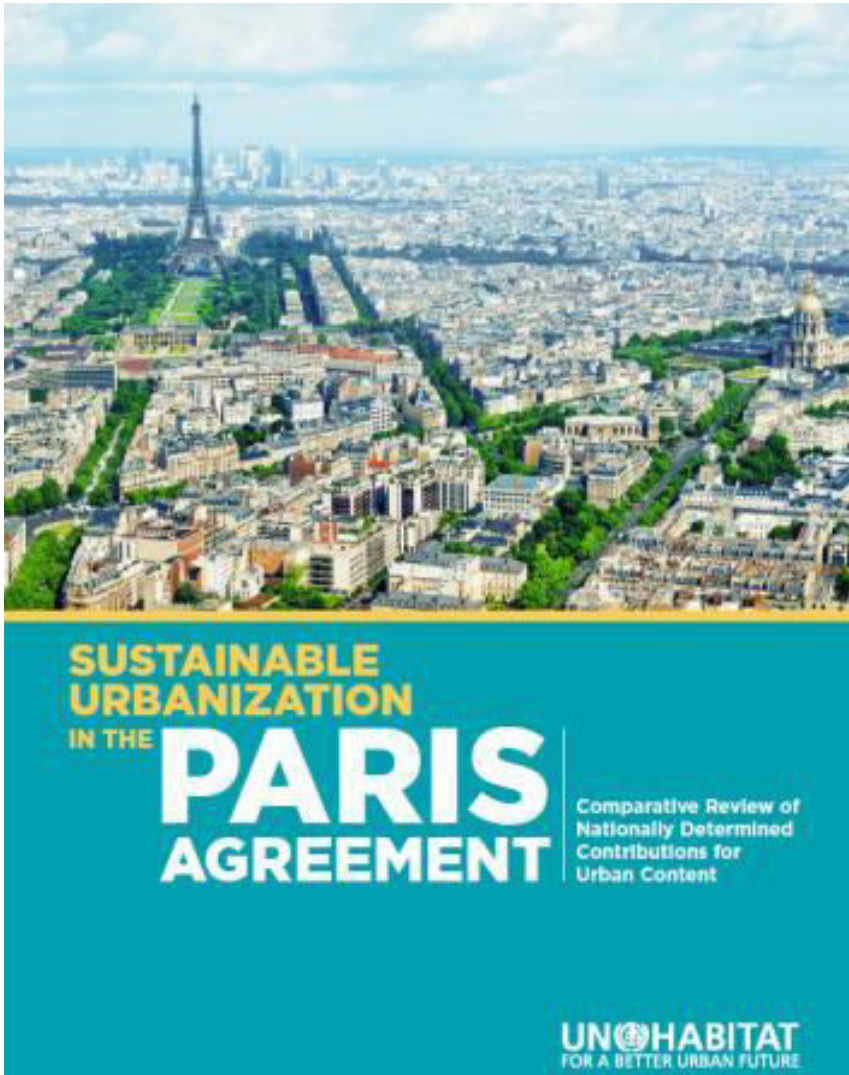
Global Agends

Correlation between the Paris Agreement Agenda 2030, and New Urban Agenda.



IMPLEMENTING
THE NEW
URBAN AGENDA

Global Framework

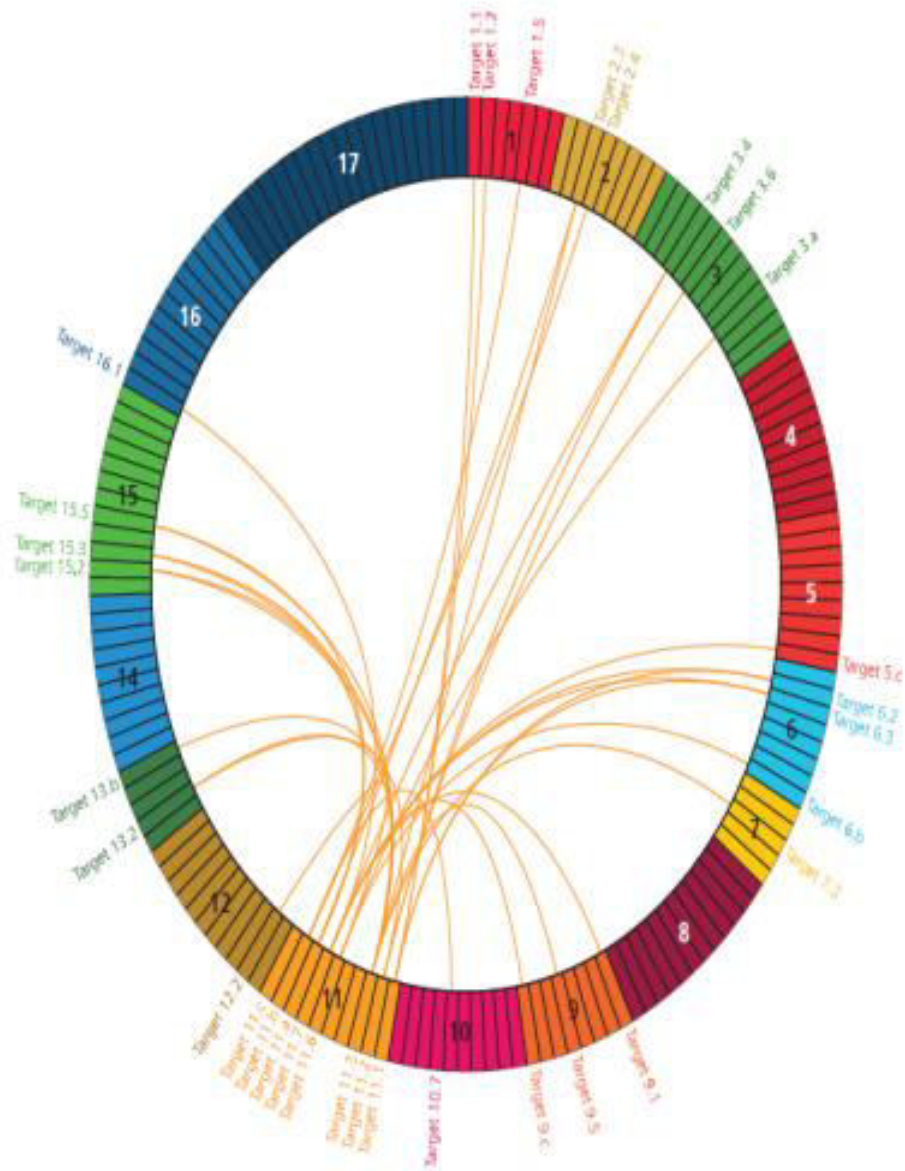


United Nations
Framework Convention on
Climate Change

- ✓ *1,5-2.0 degree goal*
- ✓ *Increasing the ability to adapt to the adverse impacts of climate change*



THE IMPACT OF SDG 11 ON OTHER GOALS



Guiding Principles for City Climate Action Planning



Ambitious



Inclusive



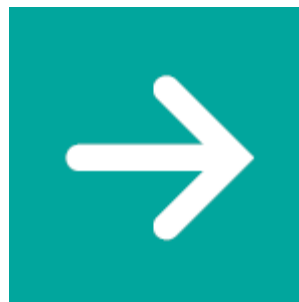
Fair



**Comprehensive and
integrated**



Relevant



Actionable



Evidence-based



**Transparent and
verifiable**

<https://unhabitat.org/the-guiding-principles/>

Role of Cities & Subnational authorities

COP-21 Decision:

- ✓ Mentions “**Cities & subnational authorities**” as a non-Party stakeholder
- ✓ Invites non-Party stakeholders to “**scale up** their efforts” & **demonstrate action** on platform
- ✓ Provides for a “**work plan**” on “capacity-building” that includes subnational level
- ✓ Calls for **new platform** to exchange experiences & best practices



What can be done about it?

1. What are Asia and Pacific Cities contributing to Climate Change
2. What impacts have you experienced and what is the relevance of Climate Change



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