

City Growth in Poor Countries: Urban Dwellers Face Climate-Related Risks

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Three Trends Will Shape the 21st Century:

- Urbanization in Poor Countries** Large increases in world population lie ahead; almost all growth to occur in the **cities and towns of poor countries**.
- Climate-Related Risks** Even today, city-dwellers in these countries are exposed to risks of severe flooding, landslides, drought, and water scarcity. **These risks likely to increase in severity and frequency as global climate change proceeds.**
- Decentralization** National governments transferring responsibilities into hands of **state and municipal governments**, which typically lack the resources and expertise to forecast risks and manage programs of climate change adaptation.

Urbanization, Adaptation, and Mitigation

Fundamental Concerns in Health and Economic Development

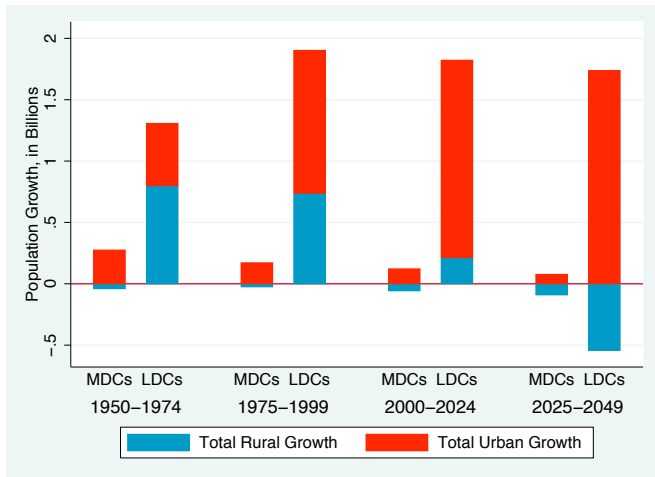
Benefits of Urbanization Urbanization both causes and is caused by income growth. Rural areas benefit from urban connections. Urbanization should be **anticipated and managed**, not resisted.

Adaptation (Balk) Climate risks accentuate need to make **long neglected investments in urban infrastructure**—sanitation, drainage, water supply—and to forewarn and protect **poor, vulnerable neighborhoods**.

Mitigation (O'Neill) Urban economic development strategies can have significant influence on carbon and other climate-changing **emissions**.

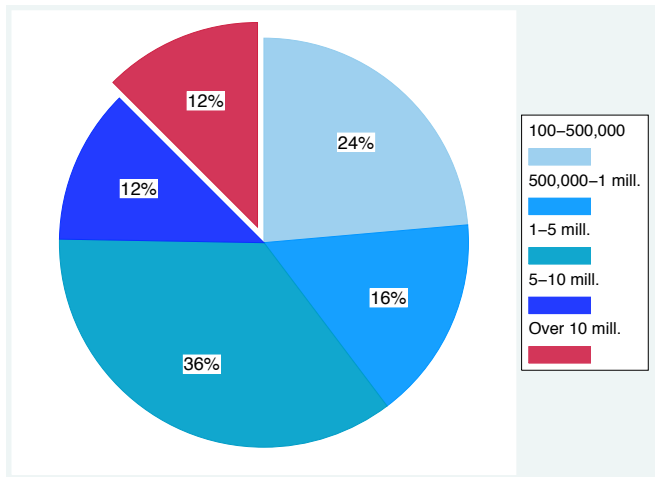
UN Projects Enormous Growth in Urban Populations

3 billion more urban dwellers in poor countries by 2050



Smaller Cities and Towns Will Need Attention

Mega-cities home to only 1 of 8 urban-dwellers (in cities of 100,000 and above)



Benefits from Urban Reproductive Health Programs

- From 40–60 percent of urban population growth is due to **urban natural increase**—the excess of urban births over urban deaths.
- There is **substantial unmet need for contraception, especially among the urban poor**.
- Voluntary **urban family planning** programs will help **ease the adaptation burden** by slowing urban population growth in the medium and long term.

Adapting Cities and Towns to Climate Change

What Can Research Contribute?

- National, regional, and municipal governments in poor countries will need **urban adaptation strategies that are spatially specific**, focusing on individual cities and neighborhoods within them.
- **Exposure to climate-related risks** being documented by bio-geophysical scientists.
- But **vulnerability** varies greatly across cities and their neighborhoods—**not being systematically documented by social scientists**.

Seaward Hazards in Low-Elevation Coastal Zones

- **Sea-level rise** (recent forecasts of < 1 meter, but edging up); increased salinity of rivers, bays, groundwater; fresh water scarcity.
- More intense and frequent tropical storms; **storm surges**—which often reach 1–5 meters and hit 9 meters during Hurricane Katrina;
- **Coastal and river flooding.**
- **Heavy precipitation, landslides** as in Rio de Janeiro this week.
- Threatens lives and health of **women, children, and the elderly.**

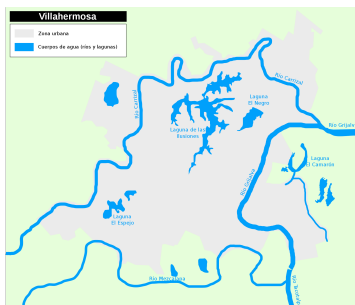
10 Largest Natural Disasters in Mexico

EM-DAT: The OFDA/CRED International Disaster Database

Disaster	Date	Total Injured, Homeless, or Needing Immediate Assistance
Earthquake	Sept. 1985	2,130,204
Storm	Oct. 2005	1,954,571
Flood	Oct. 2007	1,600,000
Storm	Oct. 2005	1,000,000
Storm	Oct. 1997	800,200
Flood	Sept. 1999	616,060
Storm	Sept. 2002	500,030
Storm	July 2008	500,000
Storm	July 1976	300,000
Storm	Oct. 1976	276,400

Floods in Tabasco, Mexico, October 2007

Grijalva River breaks dikes; state capital Villahermosa inundated



10 Largest Natural Disasters in Pakistan

EM-DAT: The OFDA/CRED International Disaster Database

Disaster	Date	Total Affected
Flood	Feb. 2005	7,000,450
Flood	Oct. 1992	6,655,450
Flood	July 1992	6,184,418
Flood	Aug. 1976	5,566,000
Earthquake	Oct. 2005	5,128,000
Flood	Aug. 1973	4,800,000
Flood	July 1978	2,246,000
Drought	Nov. 1999	2,200,000
Storm	June 2007	1,650,000
Flood	August 1996	1,300,000

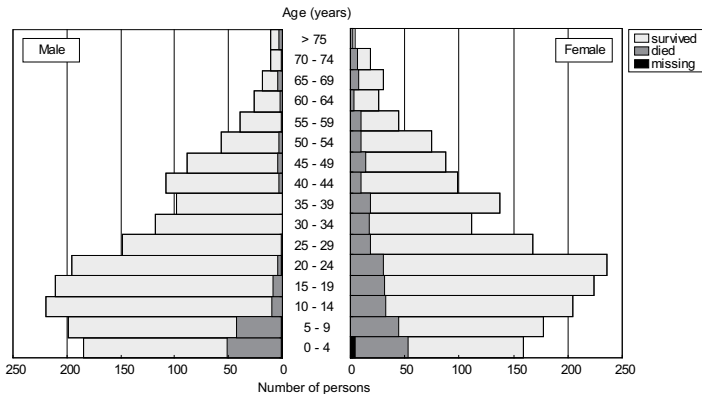
Floods in Karachi, Pakistan, June 2007

Source: BBC



The Tsunami in Sri Lanka: Deaths of Women and Children

Source: Nishikiori et al. (2006)

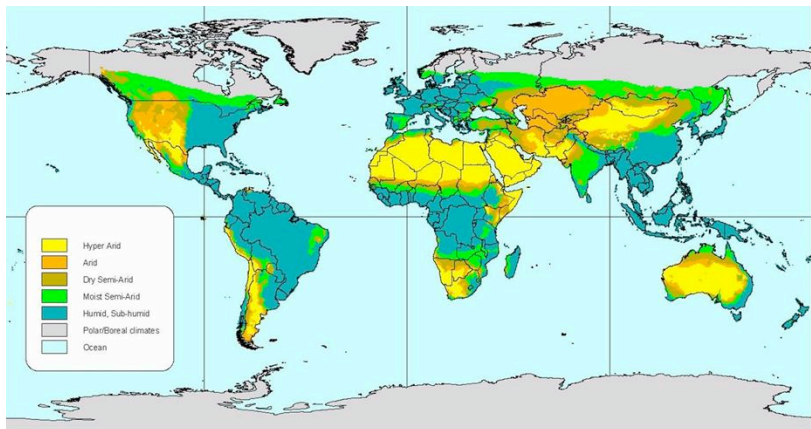


Drylands: Urban Water Scarcity and Rural Stress

Drylands are characterized by:

- **Low, erratic precipitation**, with a year's worth of rain often arriving via a few intense, erosive storms;
- Home to an estimated **2 billion persons**, 9 in 10 of whom live in poor countries. About **half of dryland residents are urban**.
- **Water scarcity** already evident; **electricity shortages** where hydropower is important; **rural out-migration** and urban implications.

Drylands World-Wide



Source: Global Agro-ecological Zones
(FAO-IIASA, 2000)

Geographic Projection (lat/long)

Bring Social Science Expertise to Bear on Adaptation

- Support more research to **link social scientists** with **bio-geophysical** scientists, and **international with local** researchers.
- **Disaggregate national census data** to political jurisdictions—municipal and below—where urban adaptation decisions need to be made. An essential step in **documenting vulnerability** to climate-related risks.
- Use national sample surveys and other accessible data to **forecast city population growth by risk zone**.
- Ensure that **National Adaptation Programmes of Action** are **evidence-based**, making full use of existing research and data.

To Sum Up:

- The **rationale for adaptation rests securely on the empirical record**—the present and the recent past provide ample evidence on which to act.
- The prospect of **climate change adds urgency**, underscores the need to address adaptation needs of the urban poor.
- **Smaller cities** and towns—with the bulk of urban population overall, but fewer resources—need attention.
- General outlines of adaptation agenda clear. **Quantification** of exposure and vulnerability now needed to set priorities. Professor Balk will describe initial quantitative evidence.

Quantifying Urban Climate-Related Risks

To quantify **exposure to risk**, we draw upon three long-standing research programs:

- The **Global Rural–Urban Mapping Project** housed at the Center for Integrated Earth Science Information Network (CIESIN) at Columbia University;
- The **UN Population Division's Cities Database**; and
- The **Demographic and Health Surveys (DHS)** and its predecessor, the World Fertility Surveys (WFS).

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