Linkages between the Human Footprint, Cities and Nature: Why Data Matter to Fulfilling the SDGs

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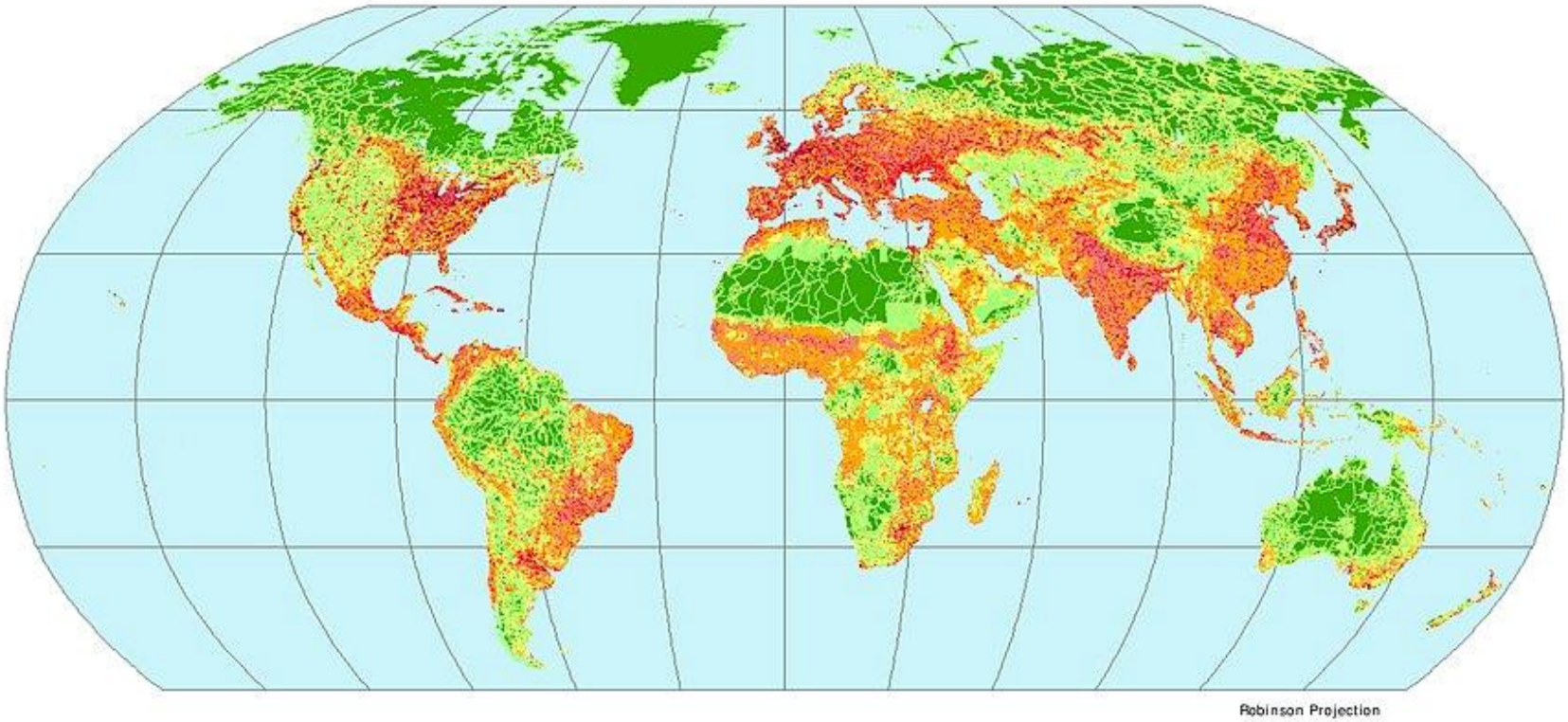
Wildlife Conservation Society

Advancing the 2030 Agenda: Interlinkages and Common Themes at the HLPF 2018
United Nations, New York City
January 25-26, 2018

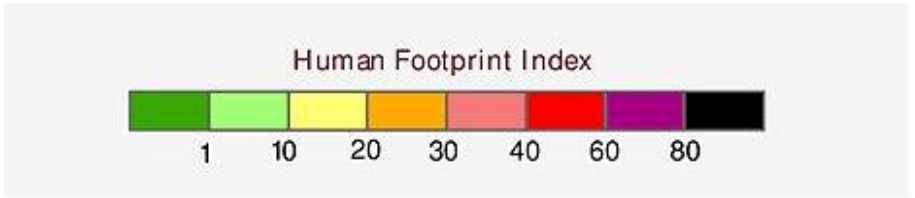
The Human Footprint ver. 2

Global



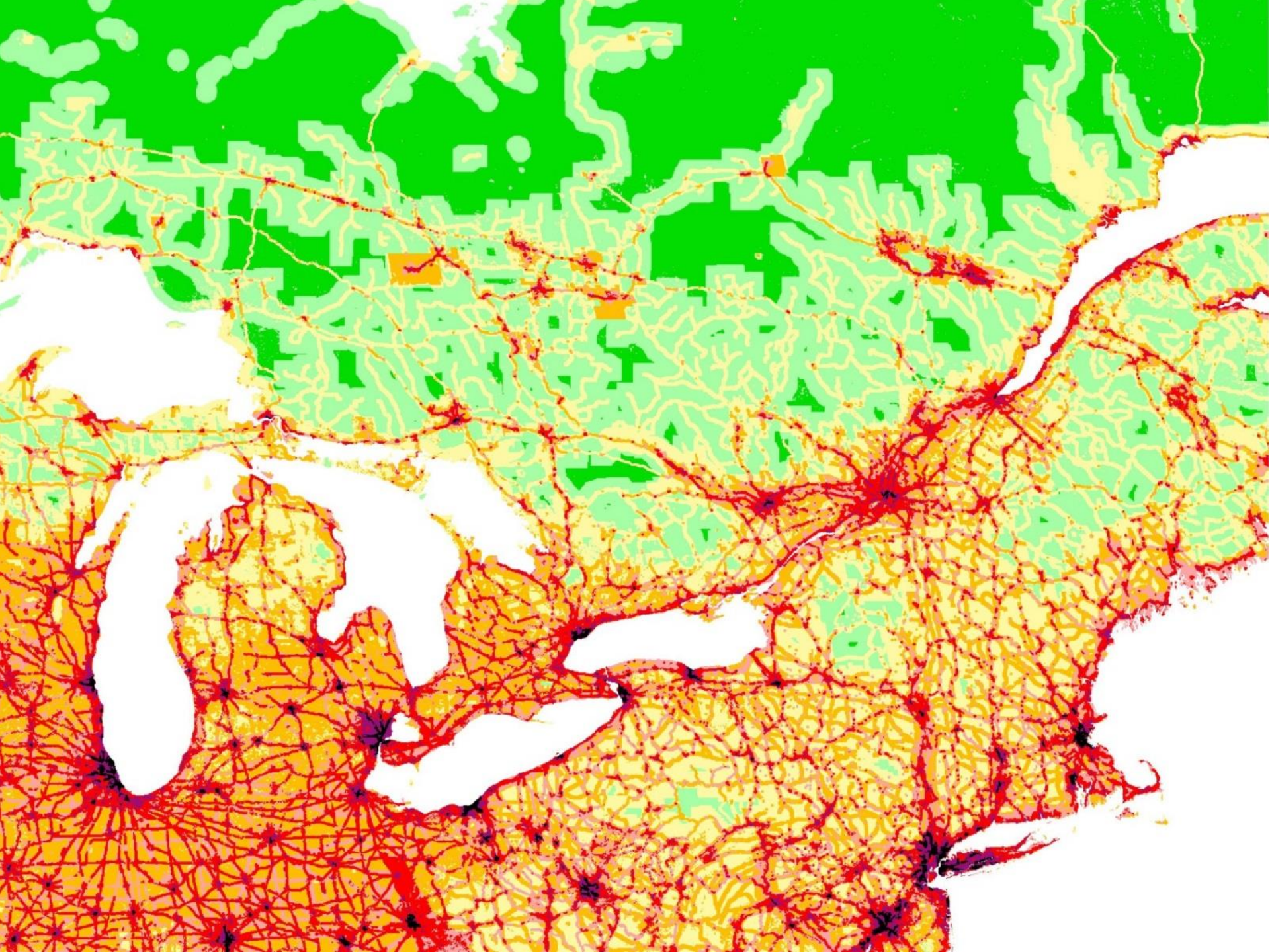
The Human Footprint Index

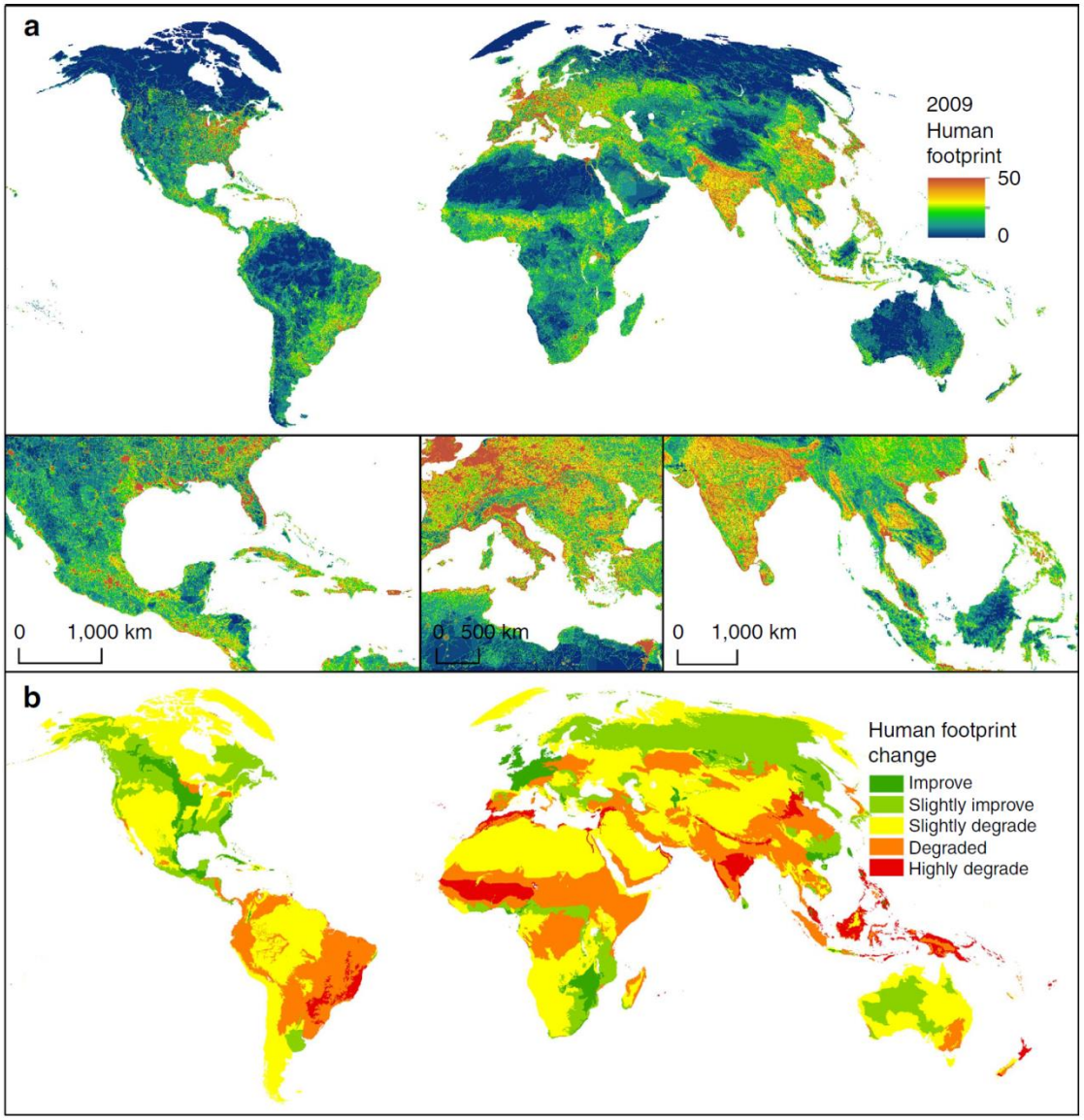
The Human Footprint Index (HF) expressses as a percentage the relative human influence in each terrestrial biome. HF values range from 0 to 100. A value of zero represents the least influenced - the "most wild" part of the biome with value of 100 representing the most influenced (least wild) part of the biome.



Copyright 2008. The Trustees of Columbia University in the City of New York. Source: Center for International Earth Science Information Network (CIESIN), Columbia University and Wildlife Conservation Society, the Bronx Zoo, New York. The Last of the Wild Data set. Available at http://www.sedac.ciesin.columbia.edu/wildareas

Publish Date: 03/07/08



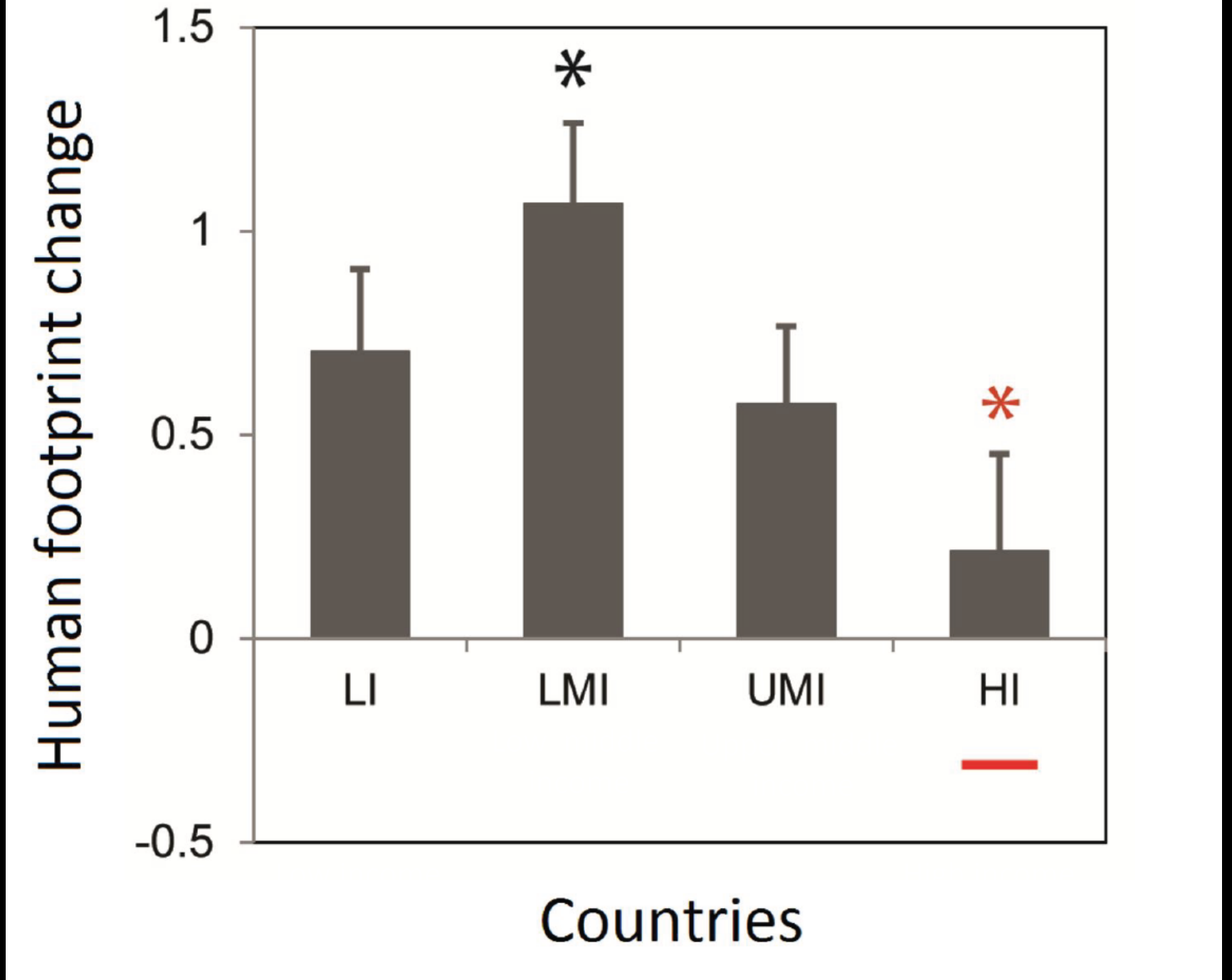


Venter et al. 2016

Figure 1 | Maps showing the current state and recent change in the global human footprint. (**a**) The global human footprint map for 2009 using a 0–50 cool to hot colour scale, and (**b**) absolute change in average human footprint from 1993 to 2009 at the ecoregion scale[74]. Data on human footprint change are summarized by ecoregions to allow for interpretation of broad patterns. Inset panels in **b** show focal regions that span the full breadth of the human footprint pressure scale.

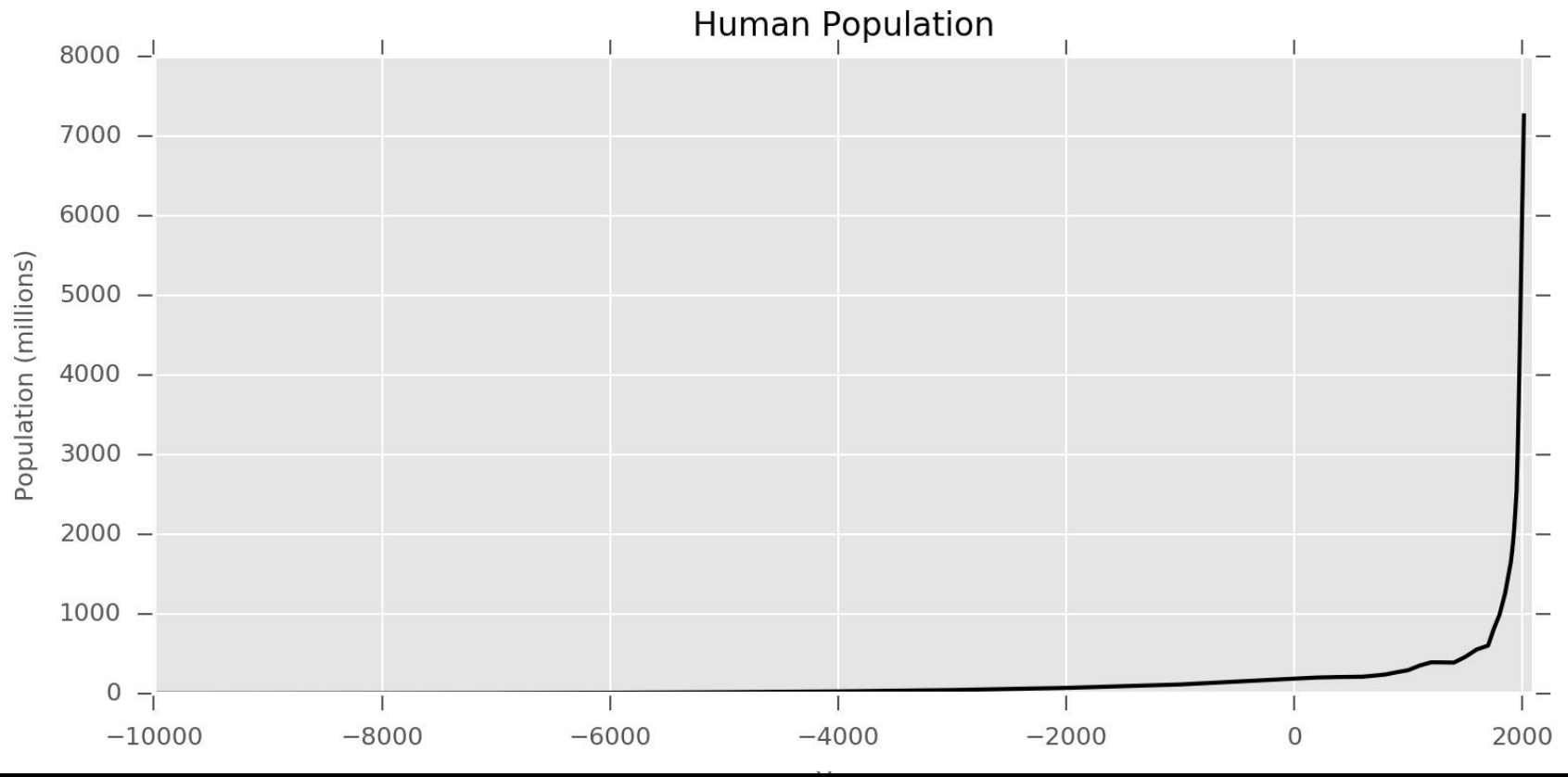
The World is Changing

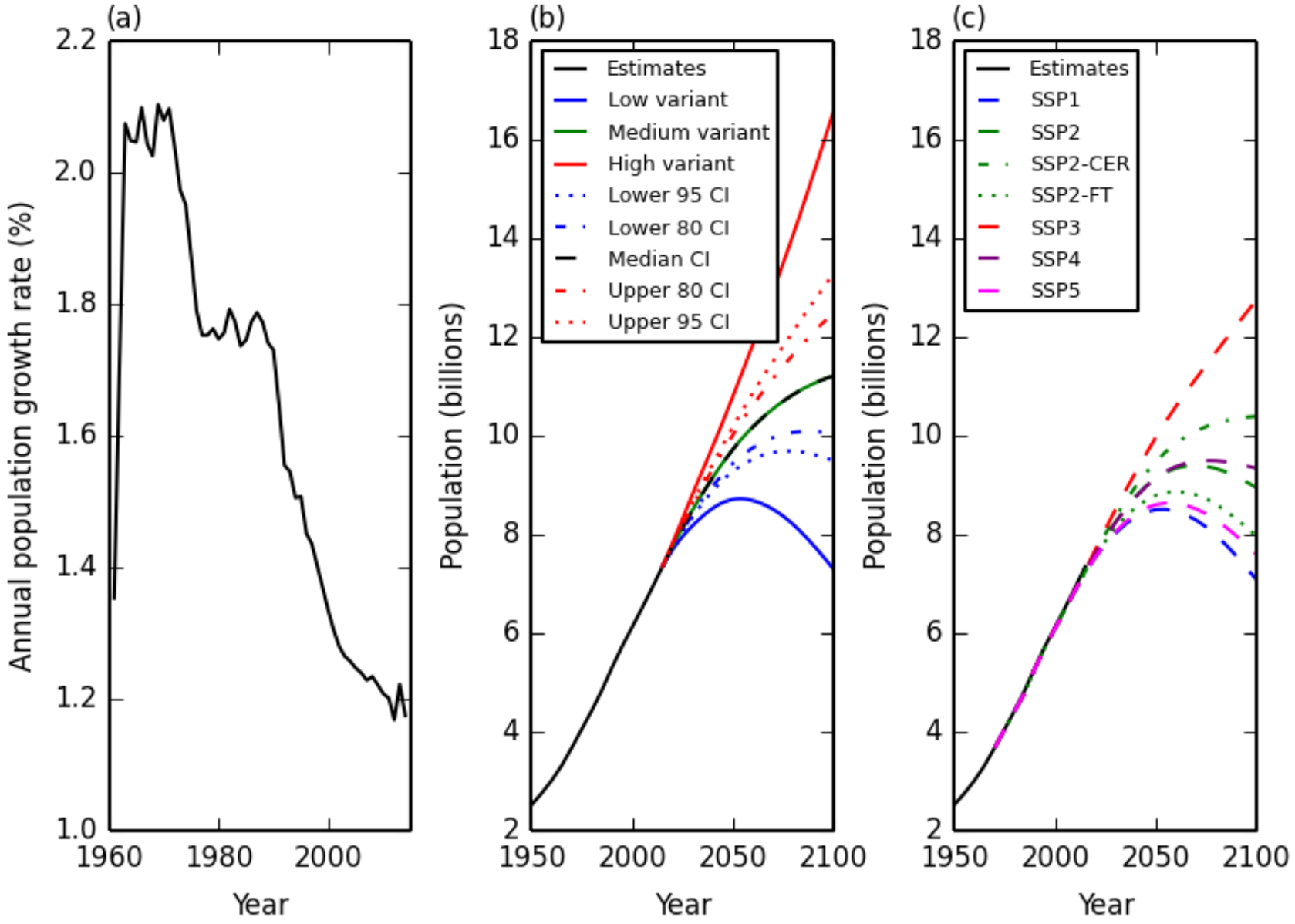
World	1993	2009	Change (%)
Human footprint (global average)	5.67	6.16	+9%
Population	5.53 billion	6.84 billion	+23%
Economy (GDP, constant 2005$, adjusted for PPP)	32.4 trillion	81.9 trillion	+153%


1.5
1
0.5
0
-0.5
Human footprint change
*
*
LI
LMI
UMI
HI
Countries

Three global trends

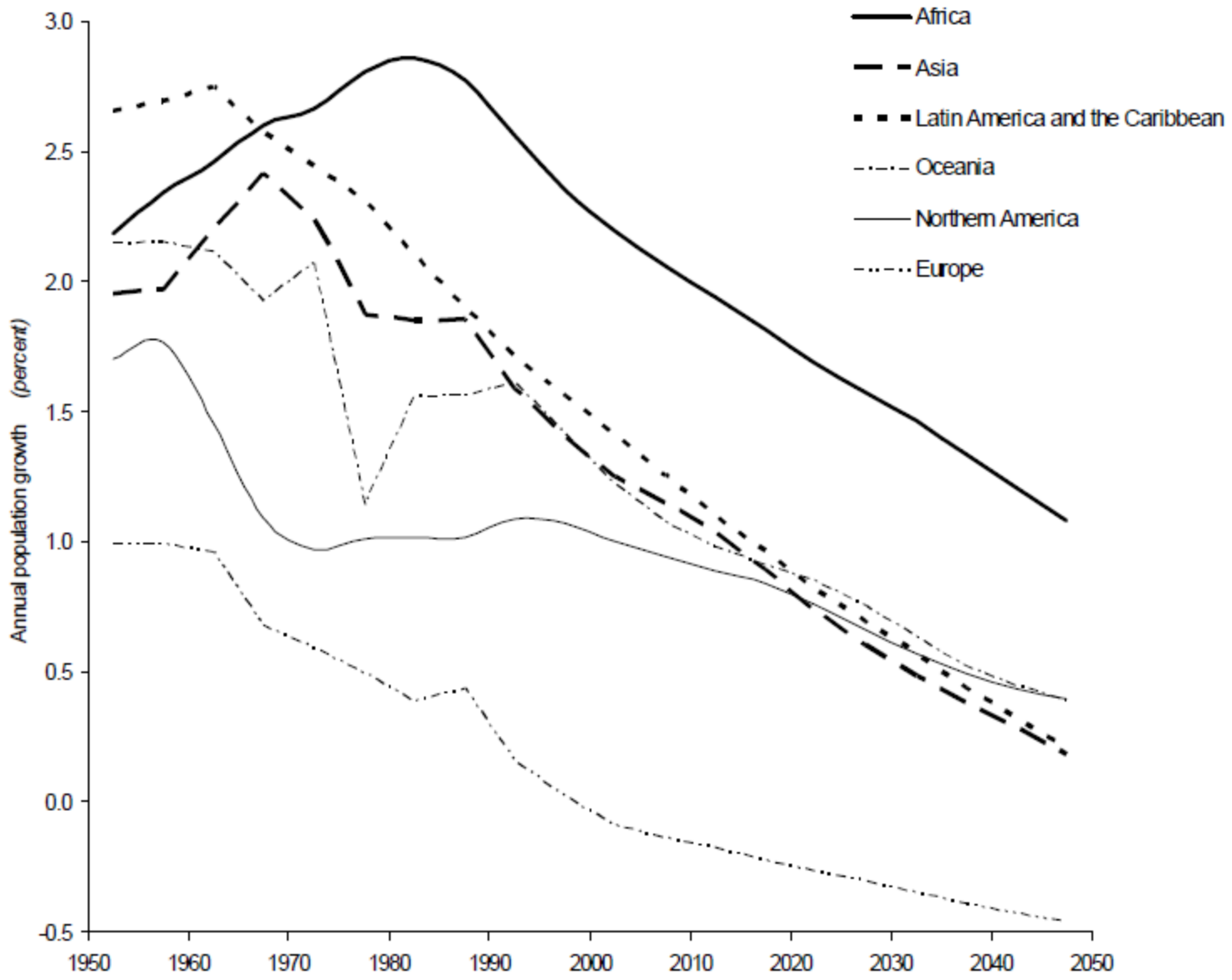
1. Human Population





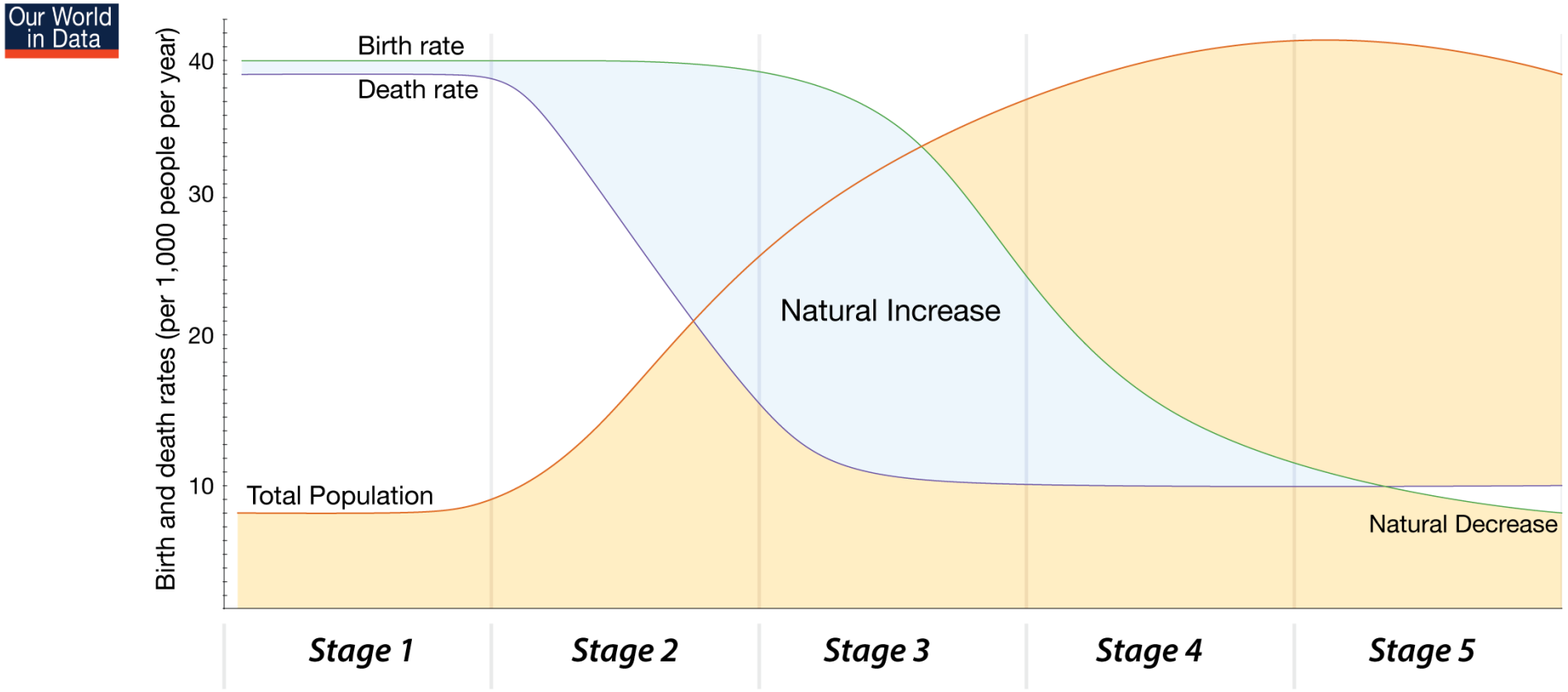
(a) World Bank 2016, (b) UN Population Division 2015 , (c) KC and Lutz 2017

Figure 2. Average annual rate of population change, major areas: 1950-2050



UN Population Division 2004

Demographic Transition



	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Birth rate	*High*	*High*	*Falling*	*Low*	*Very low*
Death rate	*High*	*Falls rapidly*	*Falls more slowly*	*Low*	*Low*
Natural increase	*Stable or slow increase*	*Very rapid increase*	*Increase slows down*	*Stable or slow increase*	*Stable or slow decrease*

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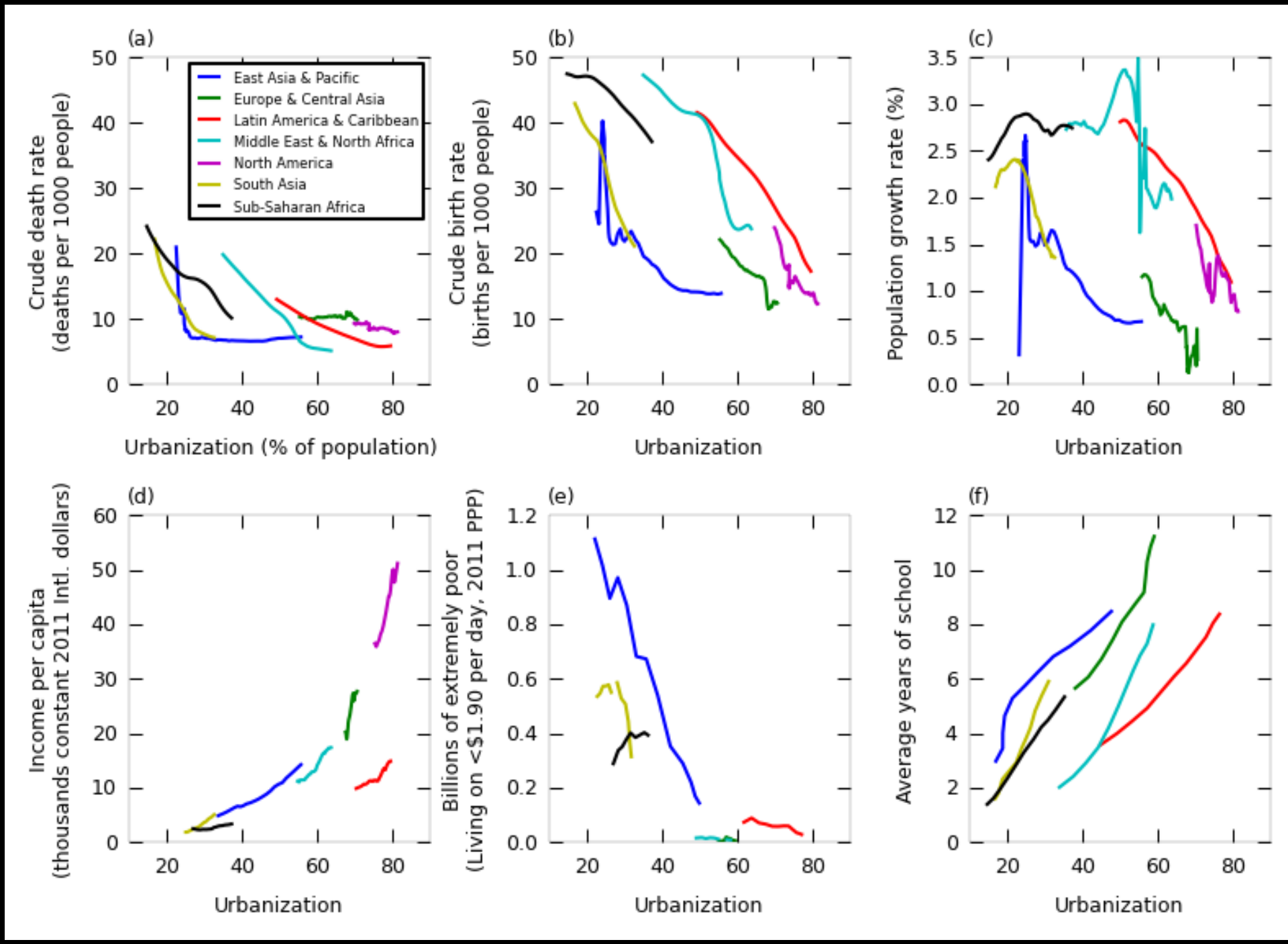
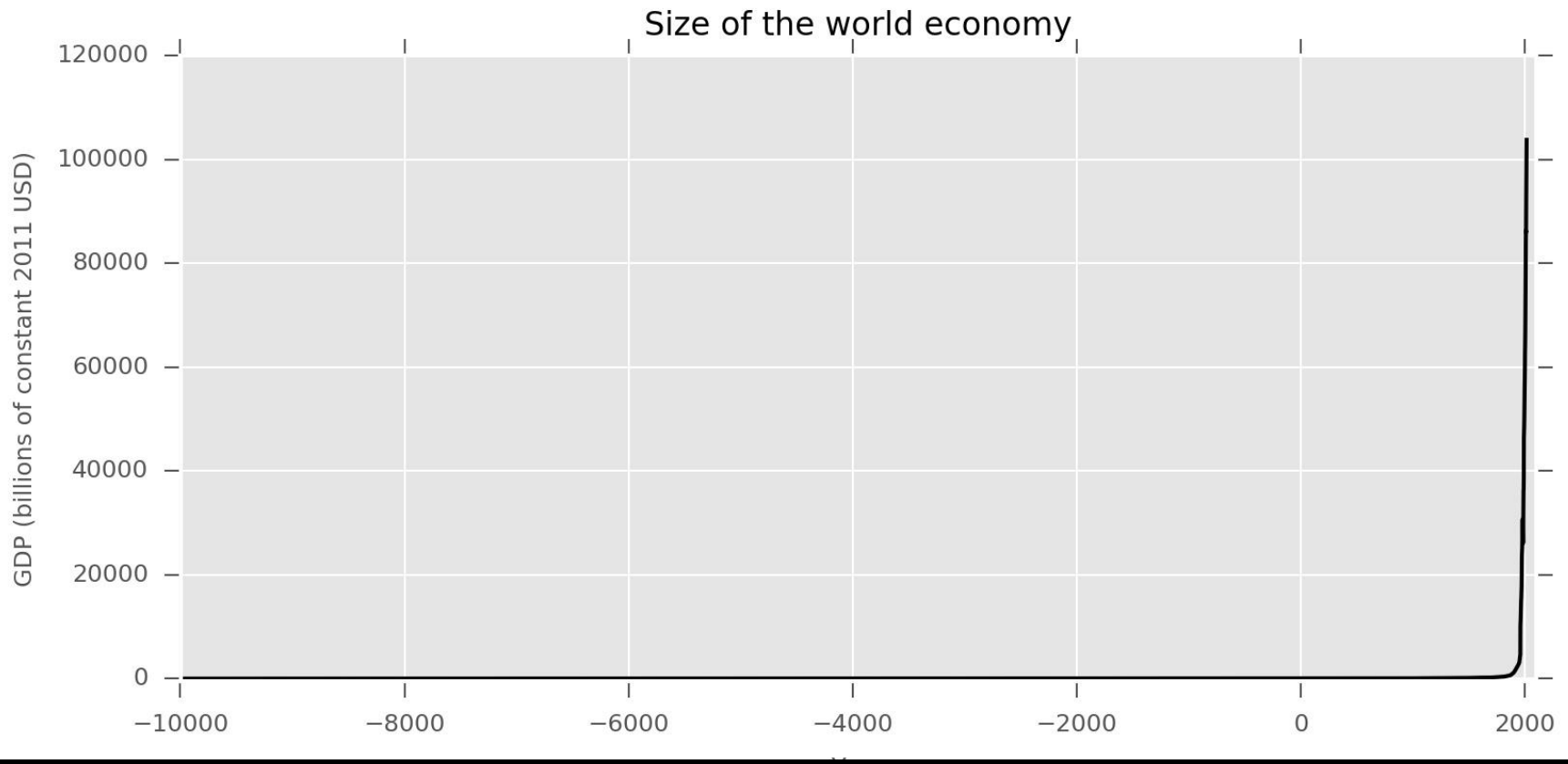
Demographic Benefits of Cities

- Urban people have fewer kids than rural folks
- Because
  - Better access to healthcare and family planning
  - Lower child mortality
  - Higher incomes from non-farm work
  - Women have more power
  - Higher costs of raising kids
  - Better outcomes from education investment

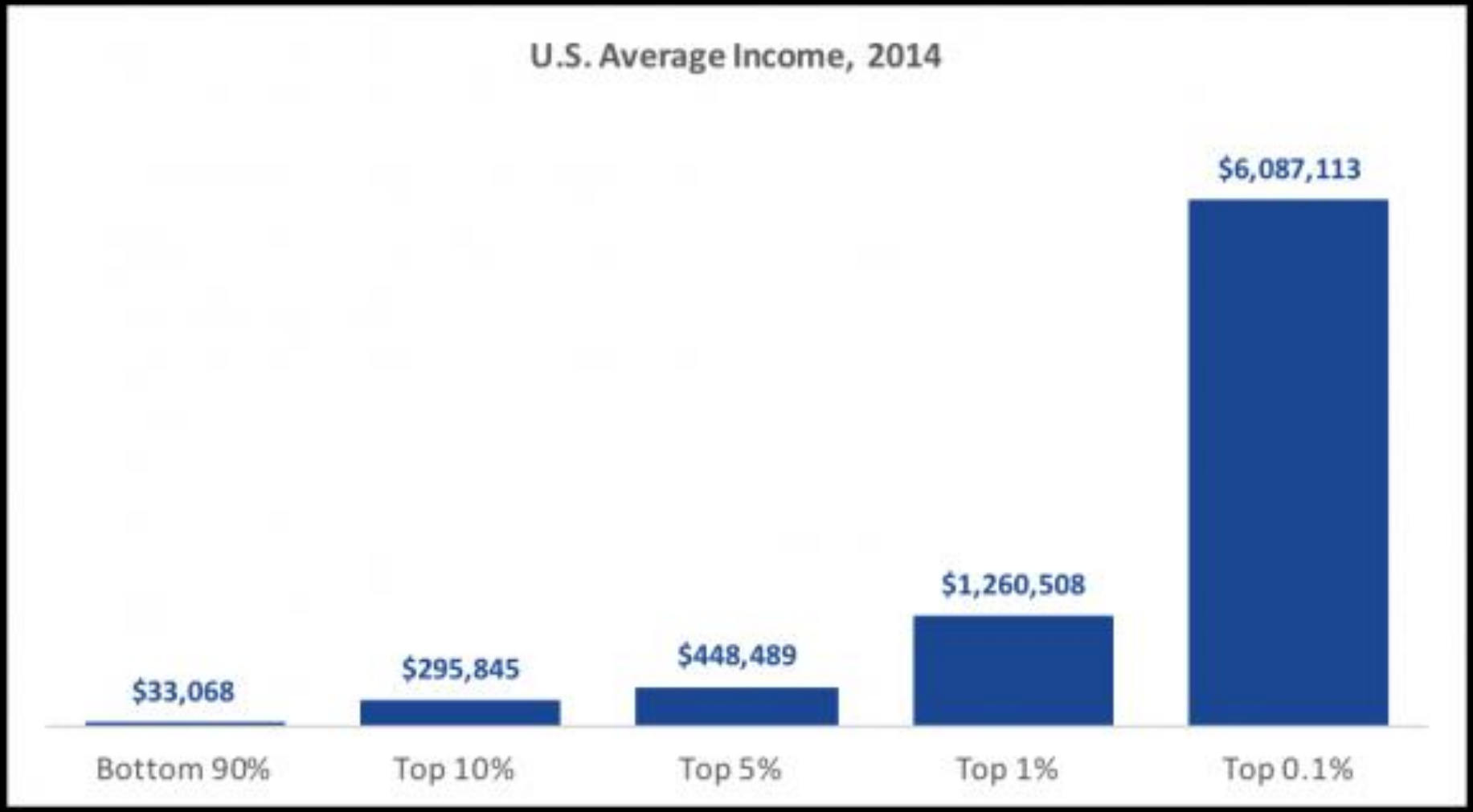

(a)
Crude death rate
(deaths per 1000 people)
Urbanization (% of population)
East Asia & Pacific
Europe & Central Asia
Latin America & Caribbean
Middle East & North Africa
North America
South Asia
Sub-Saharan Africa
(b)
Crude birth rate
(births per 1000 people)
Urbanization
(c)
Population growth rate (%)
Urbanization
(d)
Income per capita
(thousands constant 2011 Intl. dollars)
Urbanization
(e)
Billions of extremely poor
(Living on <$1.90 per day, 2011 PPP)
Urbanization
(f)
Average years of school
Urbanization

2. World Economy



Maddisson 2007; World Bank 2016

Income inequality



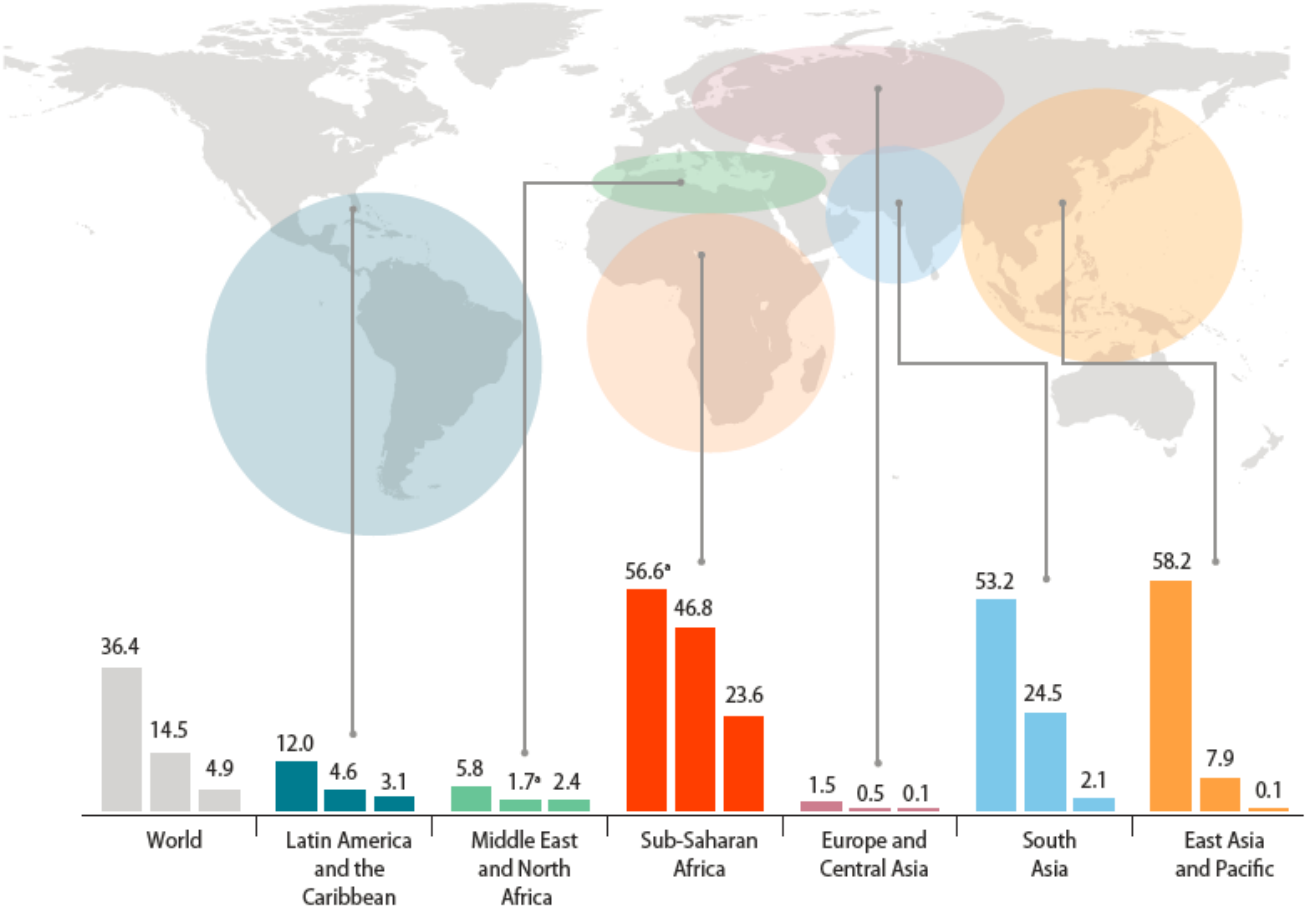
Emmanuel Saez (Center for Equitable Growth) 2015

Wikimedia Commons / Warren Buffett by Mark Herschel; Street child by Md. Tanvirul Islam

Declines in extreme poverty

FIGURE O.1 **Global and regional poverty rate estimates for 1990, 2011, and 2030**

Percent



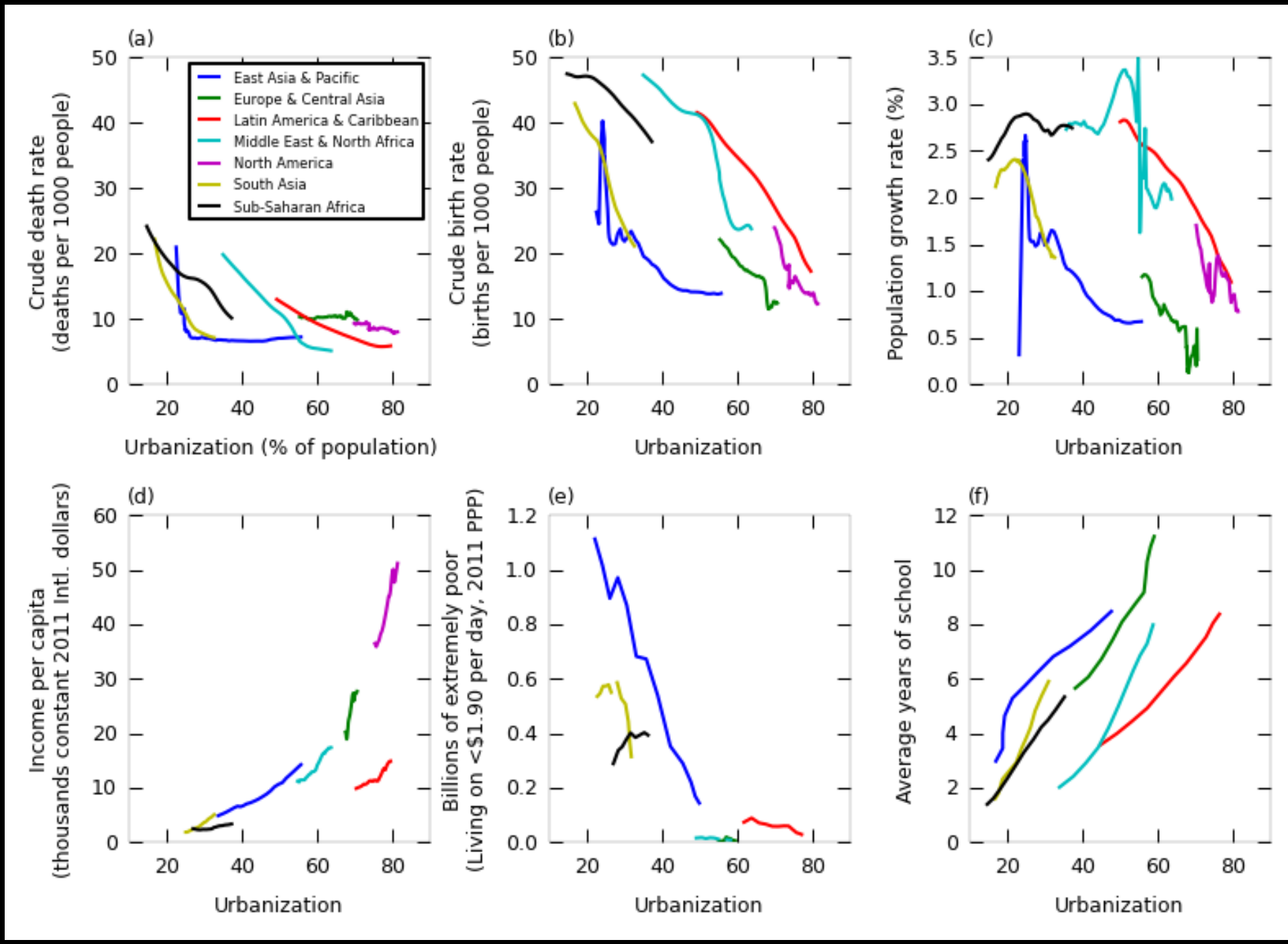
Source: PovcalNet is the online tool for poverty measurement developed by the Development Research Group of the World Bank. See http://iresearch.worldbank.org/PovcalNet/index.htm for additional information and data.

Note: The 1990 and 2011 estimates are based on Household Budget Surveys, and 2030 is a projection based on a reference scenario. See the discussion on scenarios in the Report Card.

a. Refers to the numbers that are provisional because survey coverage is less than 50 percent of population in the region.

Economic benefits of cities

- Urbanization drives economic growth
  - Concentrates workers and firms
  - Increase worker productivity
- Agglomeration effects
  - Economies of scale (bigger markers, shorter distances)
  - Specialization of labor (more competition, greater rewards to specialization)
  - Better infrastructure at lower per-capita costs
  - Improved learning and innovation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Urbanization
(f)
Average years of school
Urbanization

3. Urbanization

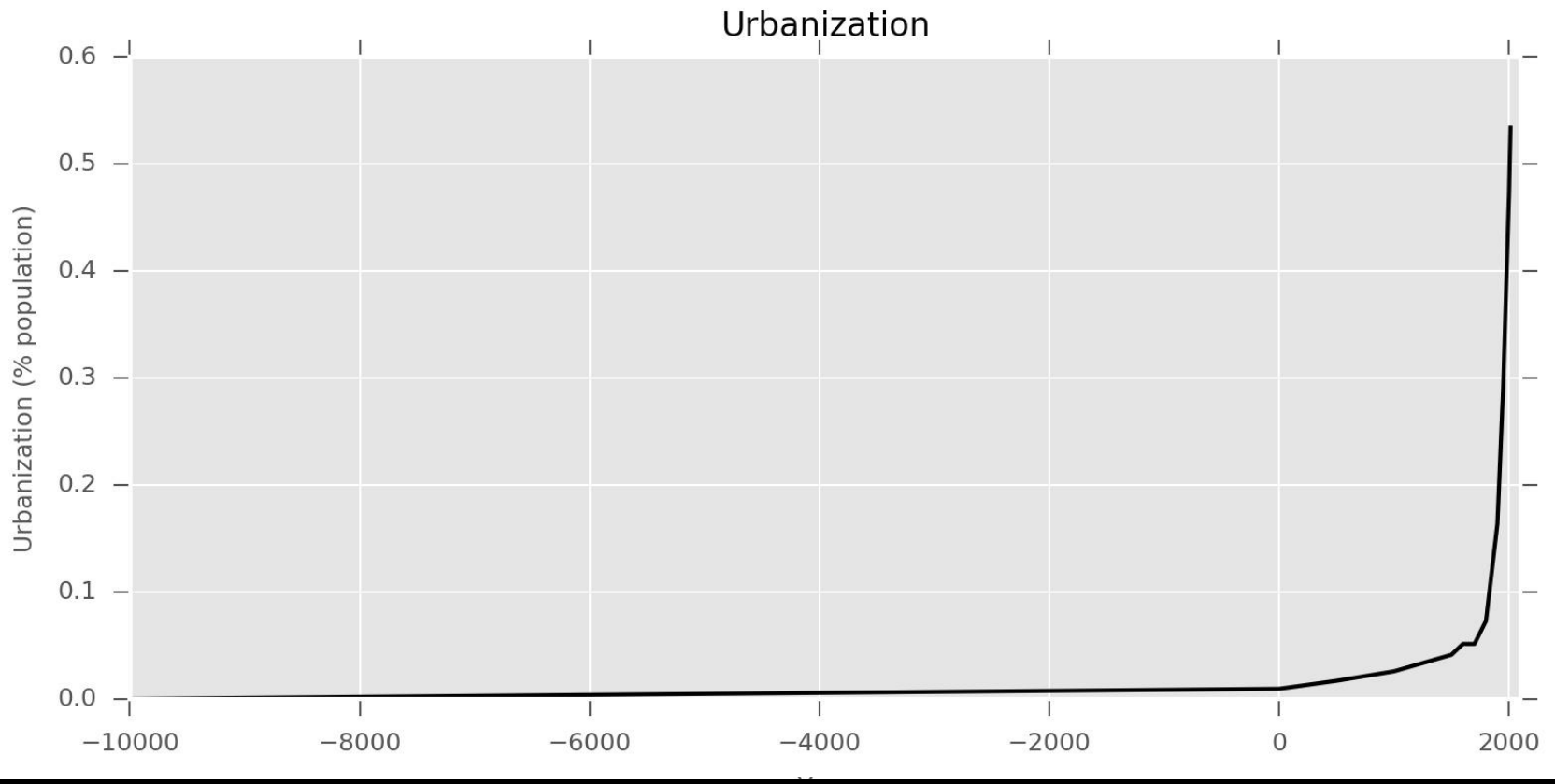
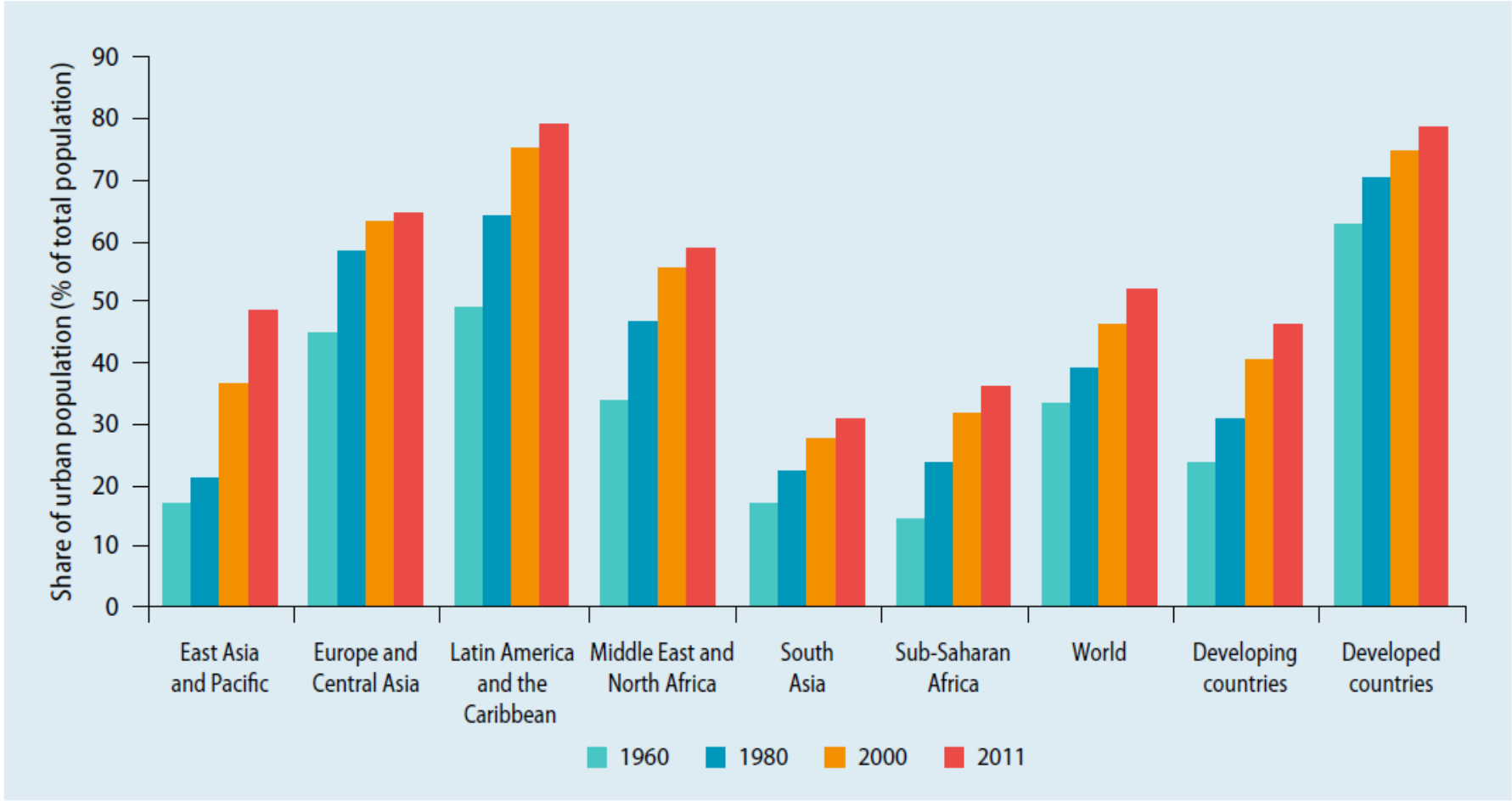


FIGURE 2.1 **The world is becoming more urban**



Source: World Bank 2012c.

World Bank / IMF 2013

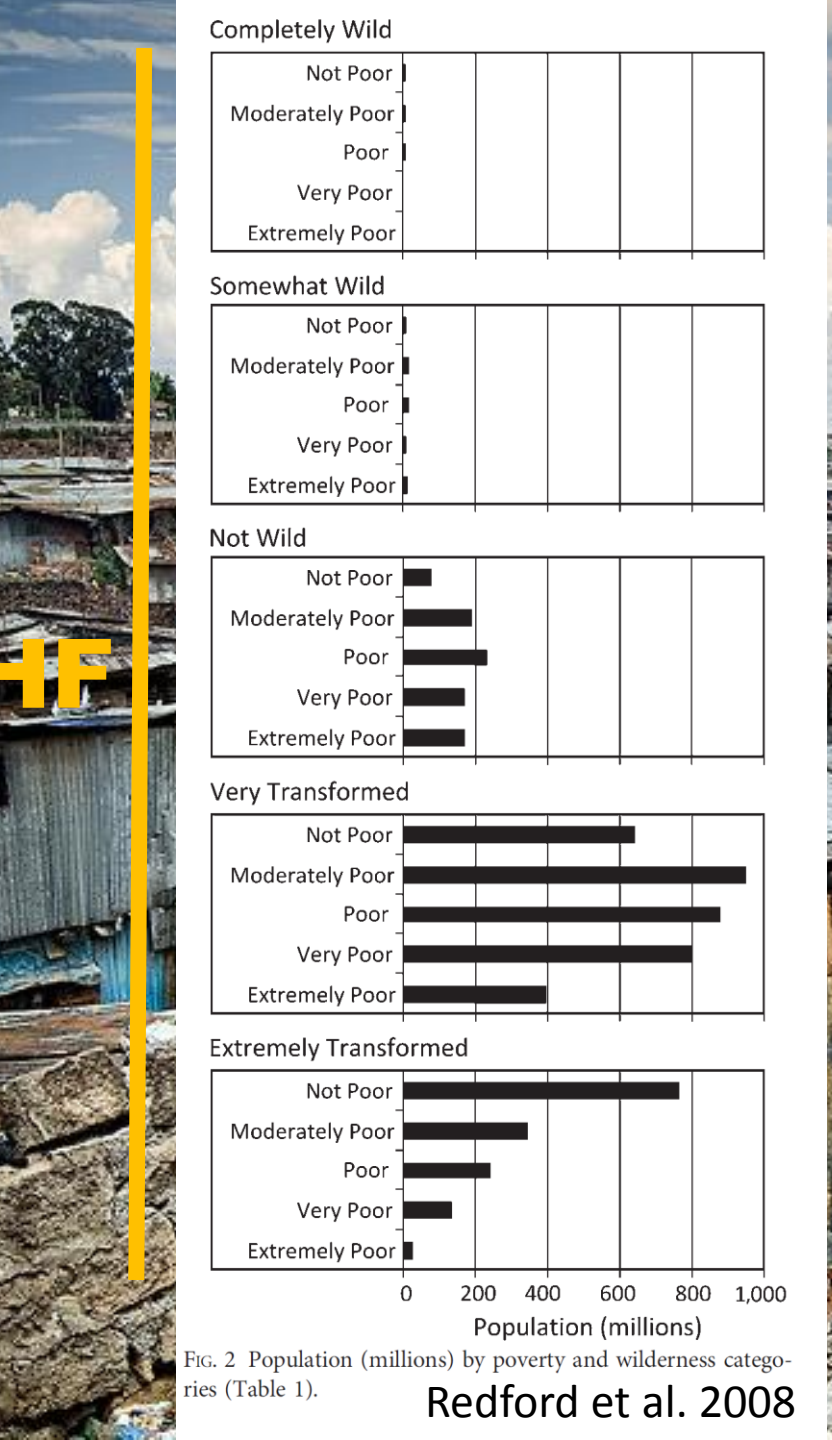
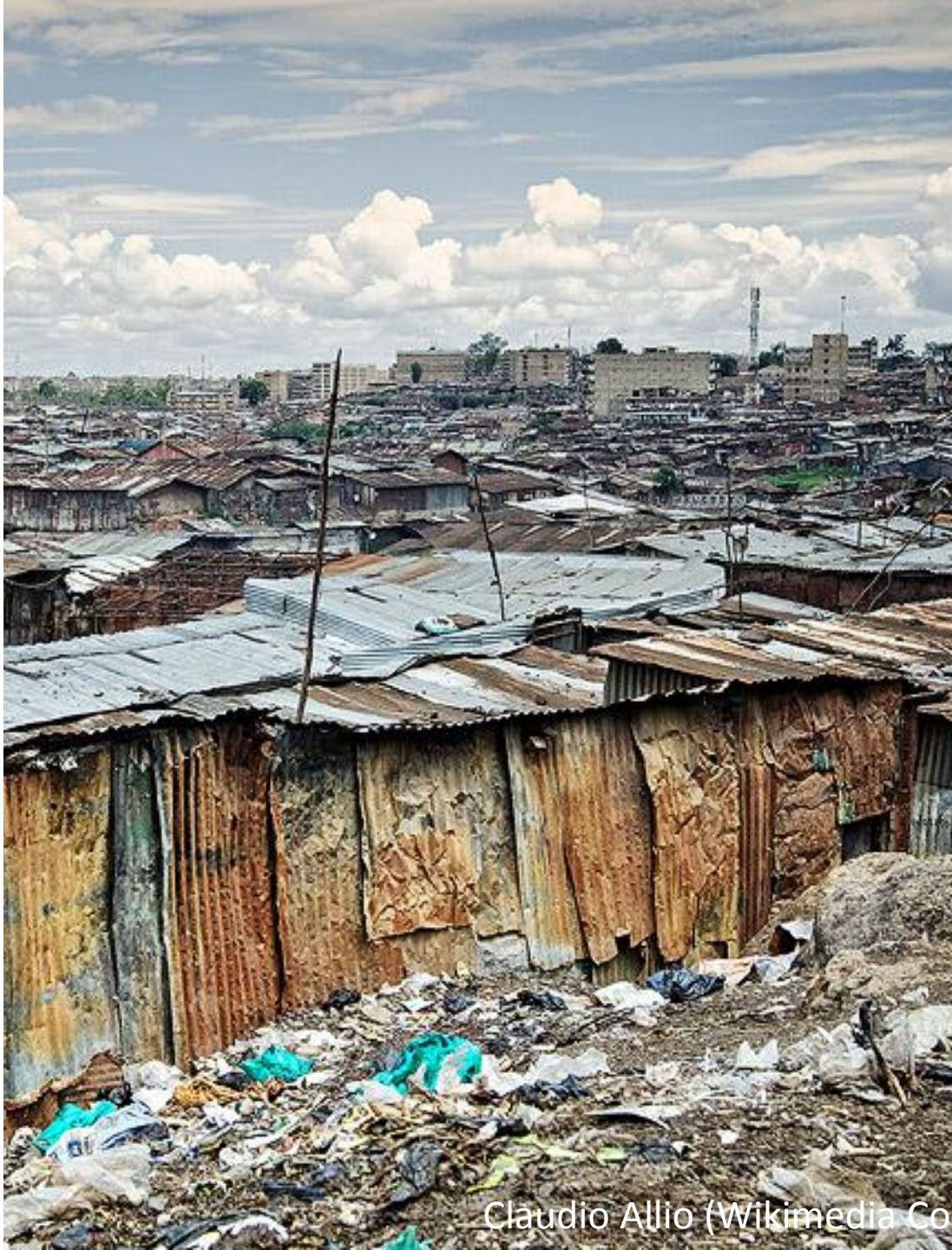


FIG. 2 Population (millions) by poverty and wilderness categories (Table 1).

Redford et al. 2008



Claudio Allio (Wikimedia Co

Why urbanize?

- People move to town for opportunity
- Opportunities for
  - Better jobs
  - Better income
  - Better education
  - Better outcomes for themselves and for their kids

  … if and only if cities are safe, healthy and attractive places to live

A theory of biodiversity conservation in the Anthropocene

What are the conditions for lasting biodiversity conservation?

- Global population stabilization
- End of extreme poverty
- Society dedicated to improving the environment

through…

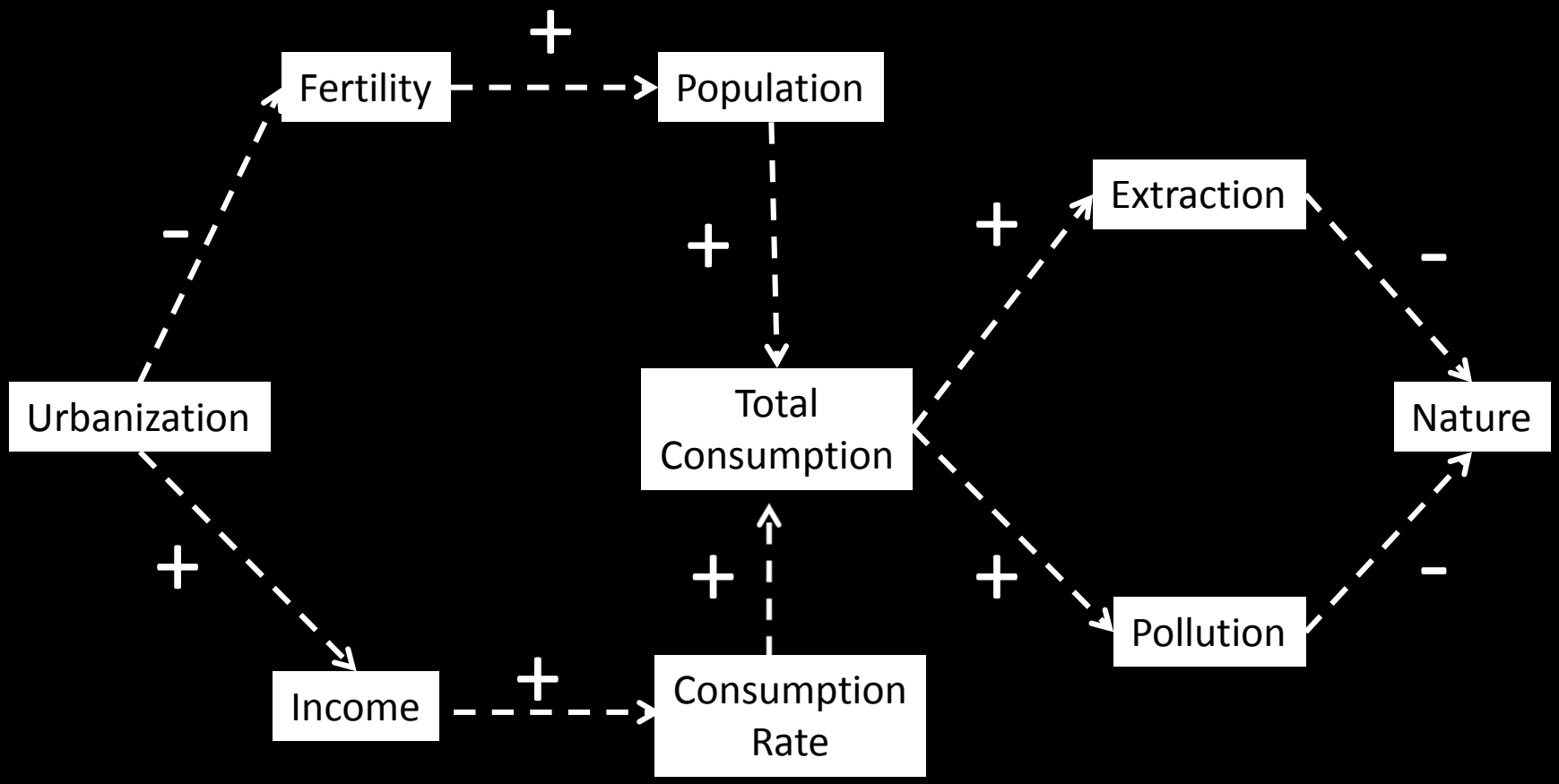
Well-functioning, attractive, desirable, sustainable

cities

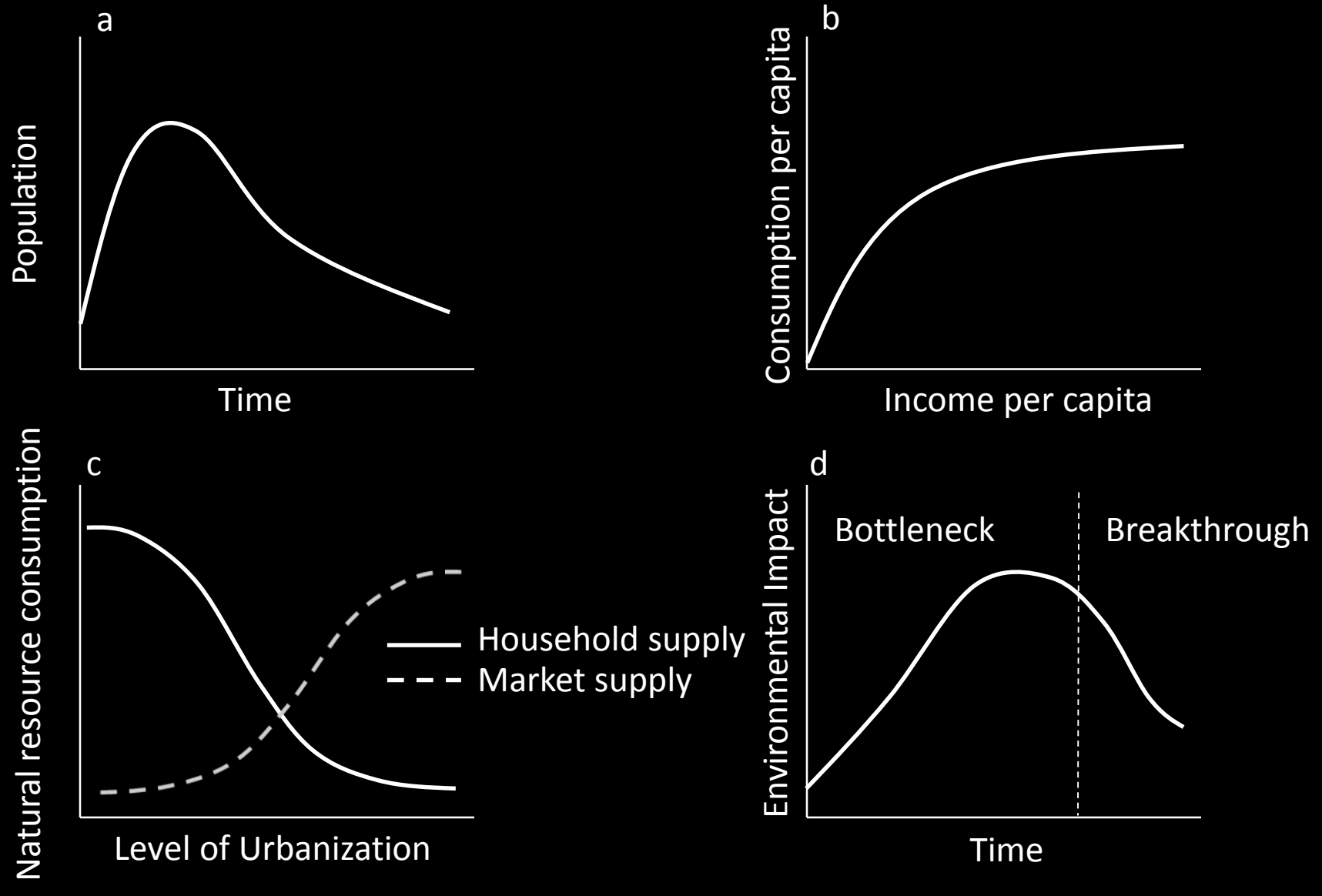
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
11 SUSTAINABLE CITIES AND COMMUNITIES
1 NO POVERTY
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
8 DECENT WORK AND ECONOMIC GROWTH

SUSTAINABLE DEVELOPMENT GOALS

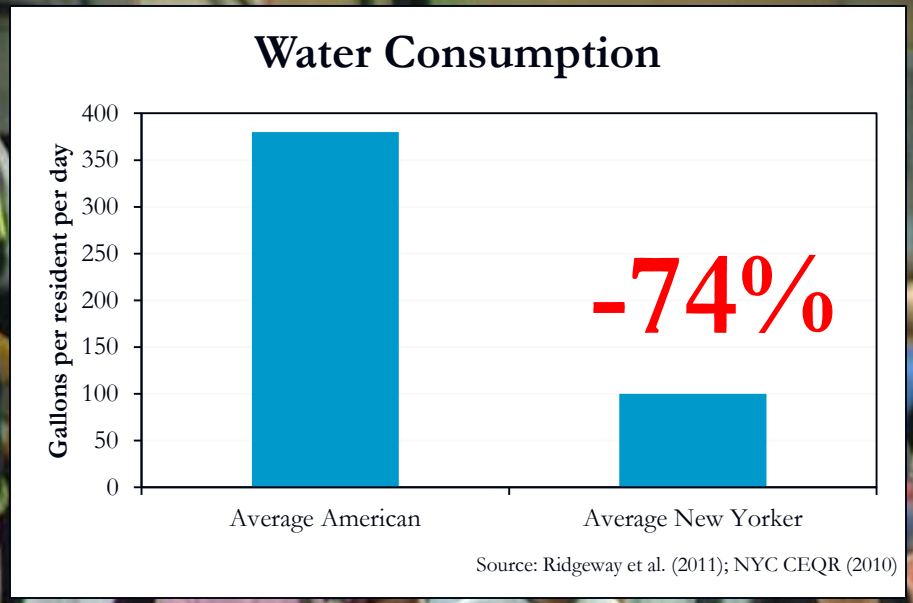
Causal connections

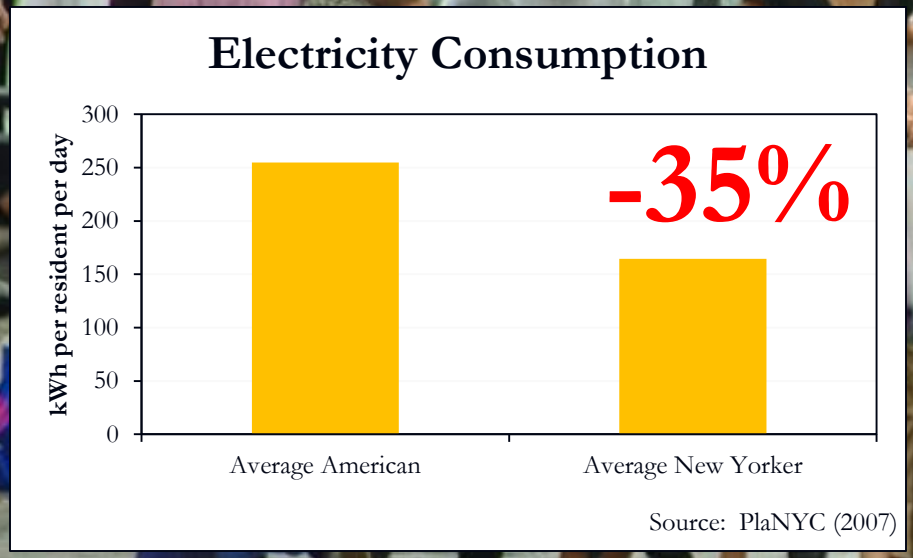


Key relationships over time

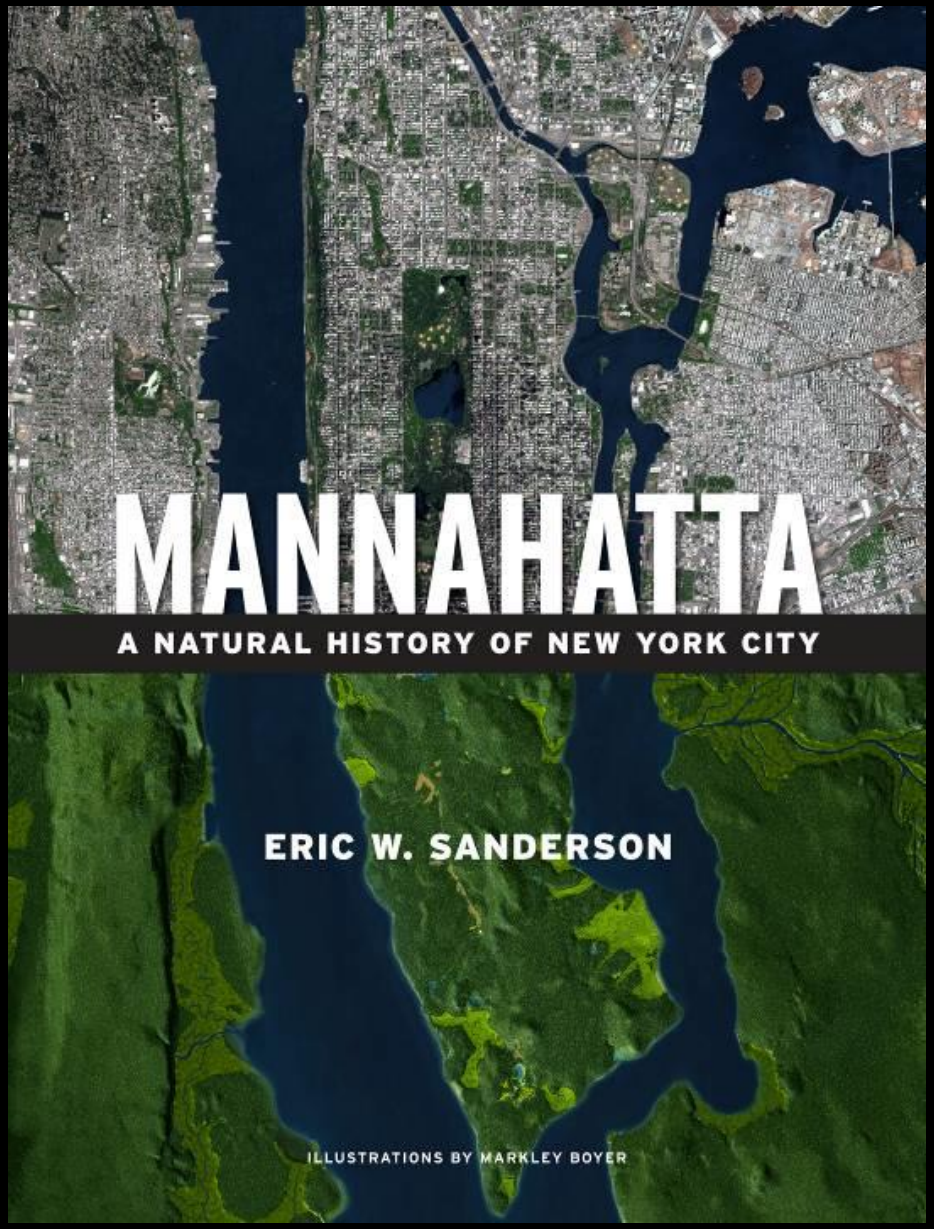


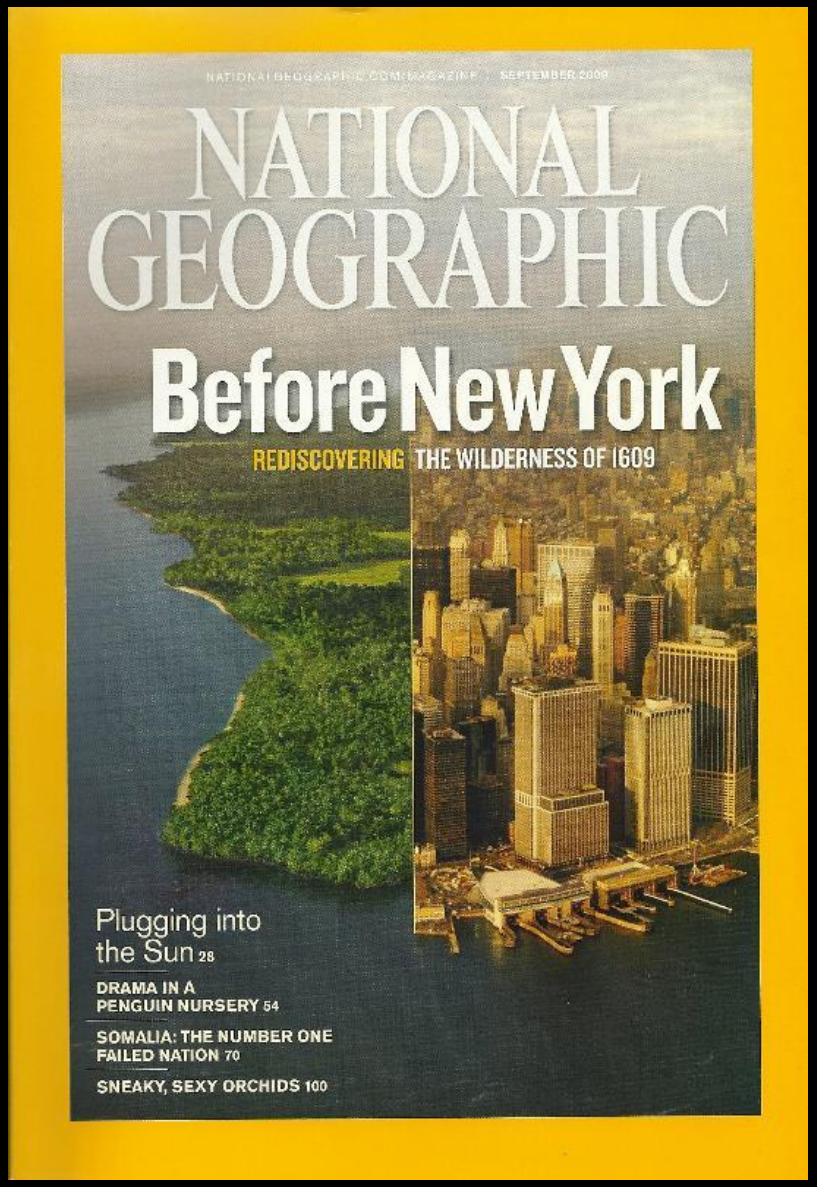
Urbanization and consumption





Source: freefoto.com


MANNAHATTA
A NATURAL HISTORY OF NEW YORK CITY
ERIC W. SANDERSON
ILLUSTRATIONS BY MARKLEY BOYER


NATIONAL GEOGRAPHIC
Before New York
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DRAMA IN A PENGUIN NURSERY 54
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TERRA NOVA
The New World After Oil, Cars, and Suburbs
ERIC W. SANDERSON
Author of Mannahatta

GOES Project
Prospects for
Resilience
INSIGHTS FROM NEW YORK CITY'S
JAMAICA BAY
EDITED BY
Eric W. Sanderson, William D. Solecki,
John R. Waldman, AND Adam S. Parris

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esanderson (SIGN OUT)
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« CREATE NEW VISION
LEARN MORE
EXISTING VISIONS »
A MORE NATURAL INWOOD AND WASHINGTON HEIGHTS
2050
Author: HIVE Orange Group

CITIES ARE THE KEY TO THE BREAKTHROUGH

G. Schmitz, Wikimedia Comm

Outline

- Introduction
- Three Global Trends
  - Demographic Transition
  - Poverty Alleviation
  - Urbanization
- A Theory of the Biodiversity Conservation in the Anthropocene
- Implications for Achieving the SDGs
- Questions

This presentation is based on a manuscript currently in review:

Sanderson EW, Walston J. and Robinson JG. From bottleneck to breakthrough: urbanization and the future of biodiversity conservation. BioScience. For more information about this manuscript, please contact Eric Sanderson at esanderson@wcs.org or 718-220-6825.

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