

# The World in 2050: Options for Sustainable Development

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On the Occasion of IIASA'S  
Thirty-Fifth Anniversary  
November 15, 2007

# Fundamental Global Drivers and Choices:

Convergence

Population

Poverty and Conflict

Energy

Ecosystem Management

Urbanization

Against an unsustainable baseline regarding  
Poverty, Ecosystems, Climate, Energy

# Key Challenges of Sustainability

Achieving the Demographic Transition

Breaking the Poverty Trap

Decoupling Growth and Carbon Emissions

Intensive Agriculture and Extensive  
Conservation

Sustainable Urbanization

# Instruments for *Sustainability*

- Investing in the End of Poverty  
poverty, demography
- Sustainable Technology  
low-emission energy  
high-intensity agriculture  
sustainable aquaculture
- Managing the Commons  
climate, biodiversity, water
- Managing Migration, trade, and spatial forcings

All require *Global Cooperation*

## An Example: Decoupling Energy and Emissions

Avoid Deforestation

Non-carbon energy to half of electricity

IGCC-CCS Coal-fired plants

Plug-in Hybrids

CCS in refineries, petrochemicals, steel,  
cement

4-fold increase in energy, 25 percent cut in  
emissions

IIASA's path-breaking contributions:

Integrated

Systems

Physical – Human interface

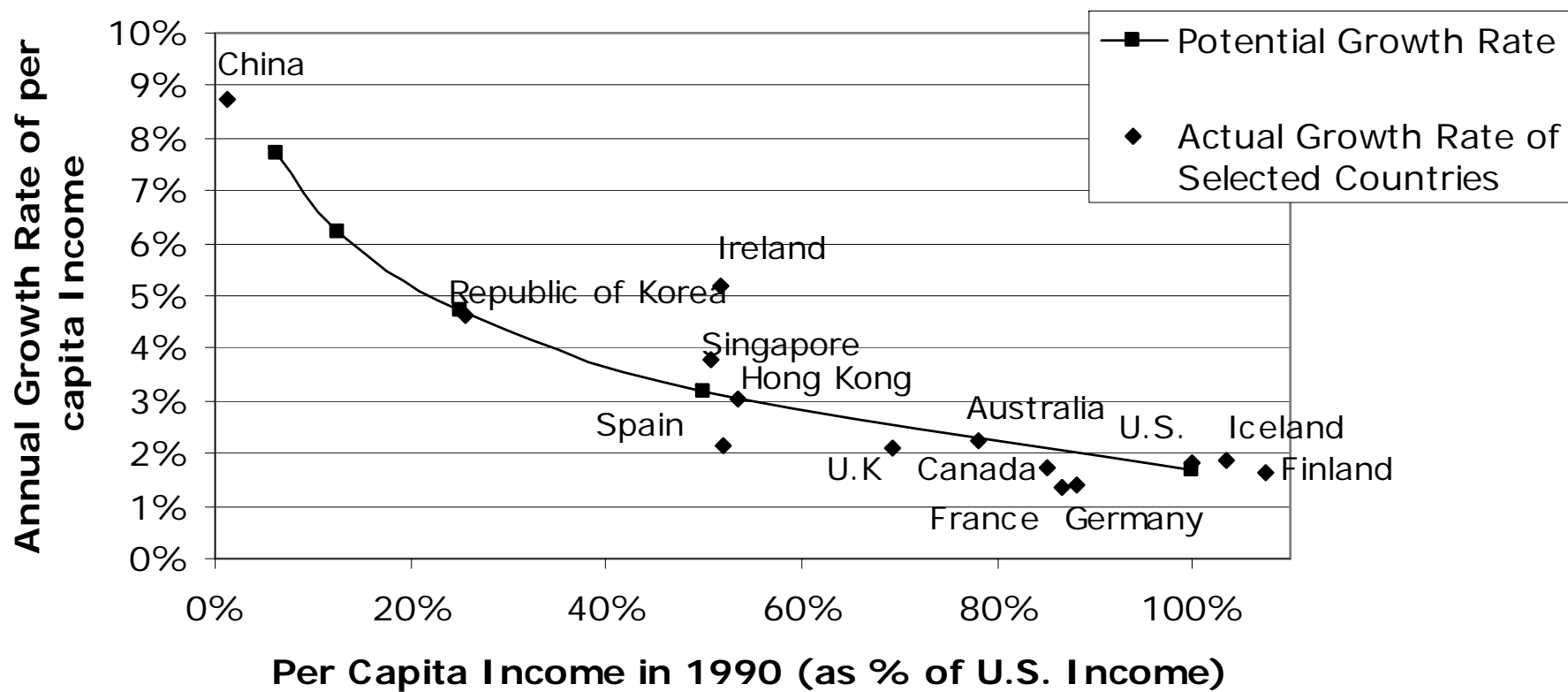
Next steps:

Dynamic technology modeling

Spatial economic modeling:

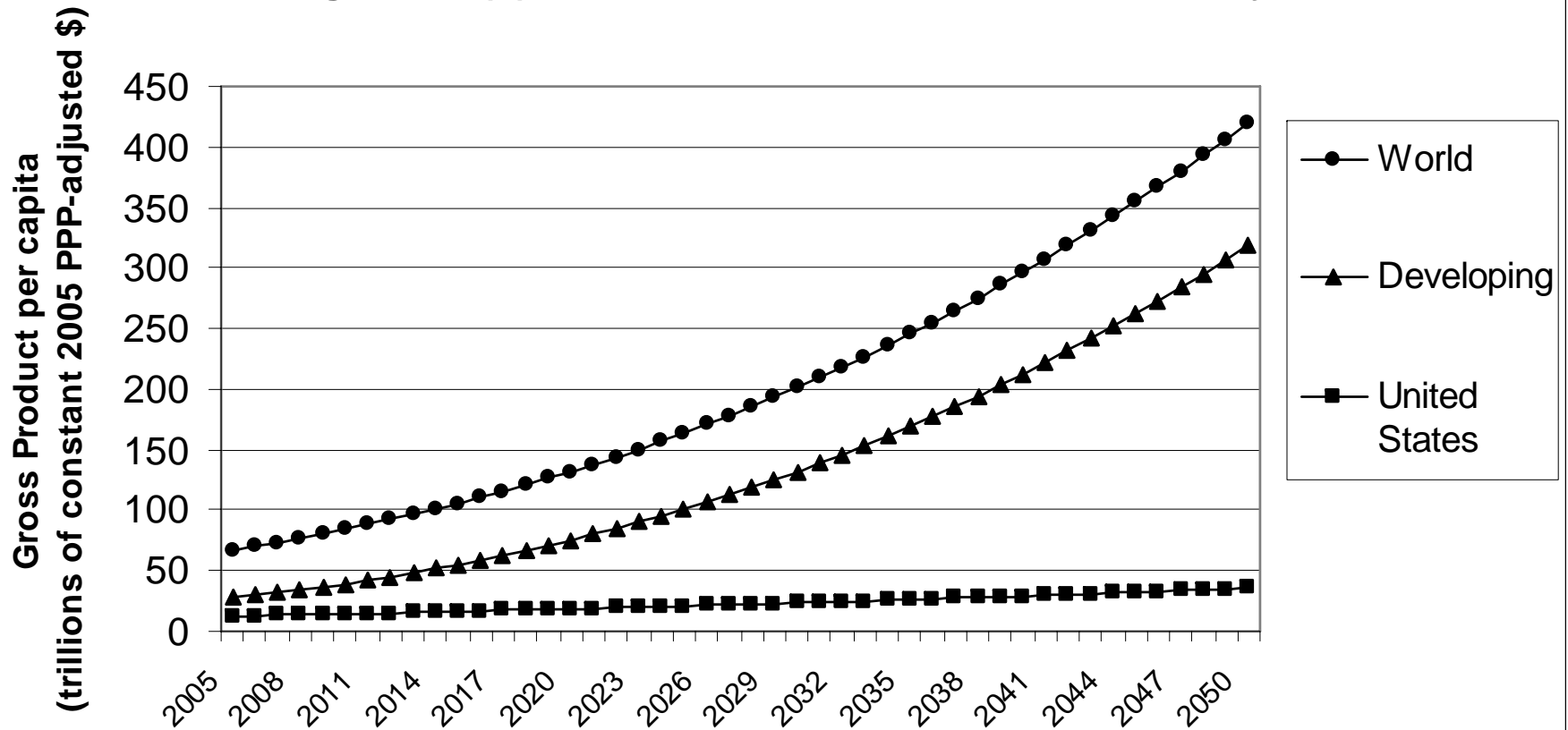
Spatial forcings, agglomeration,  
trade, migration

**Figure 2.1: Annual Growth Rates from 1990-2005 vs. Income Level in 1990**



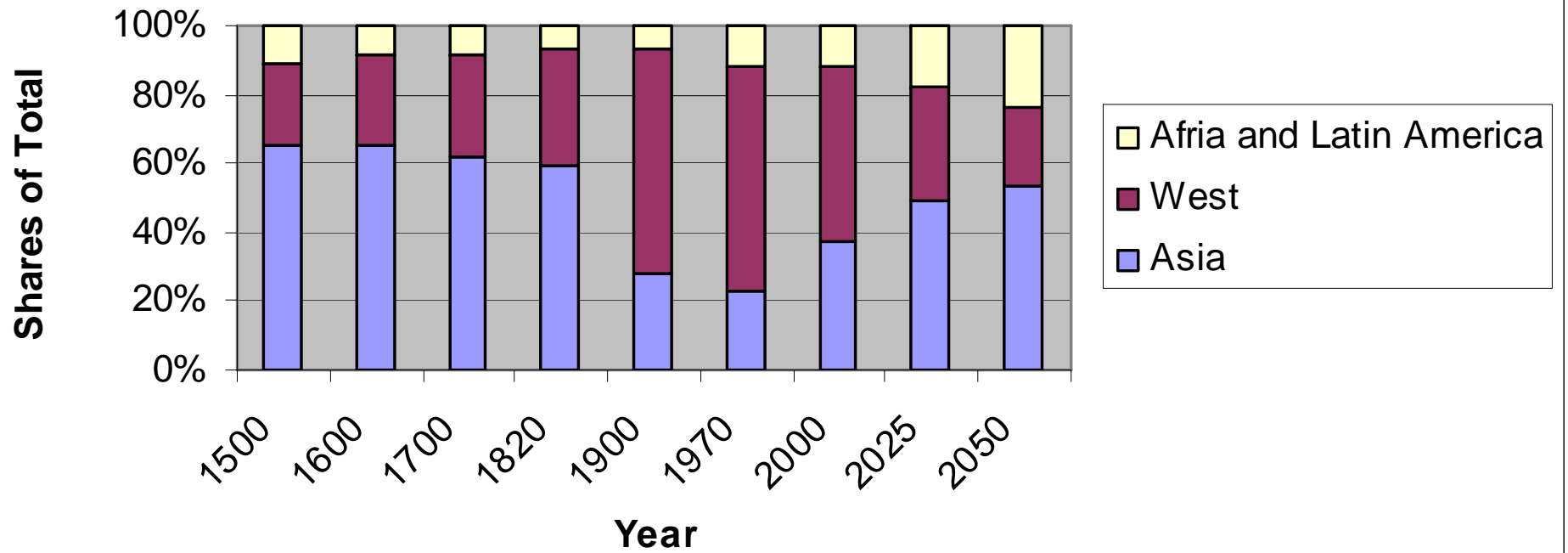
Source: Calculated using data from World Bank (2007)

Figure 2.2 (b): World Product in the Next Half Century



Source: Author's calculations using data from World Bank (2007)

## GNP Shares by Region



## Share of World Population

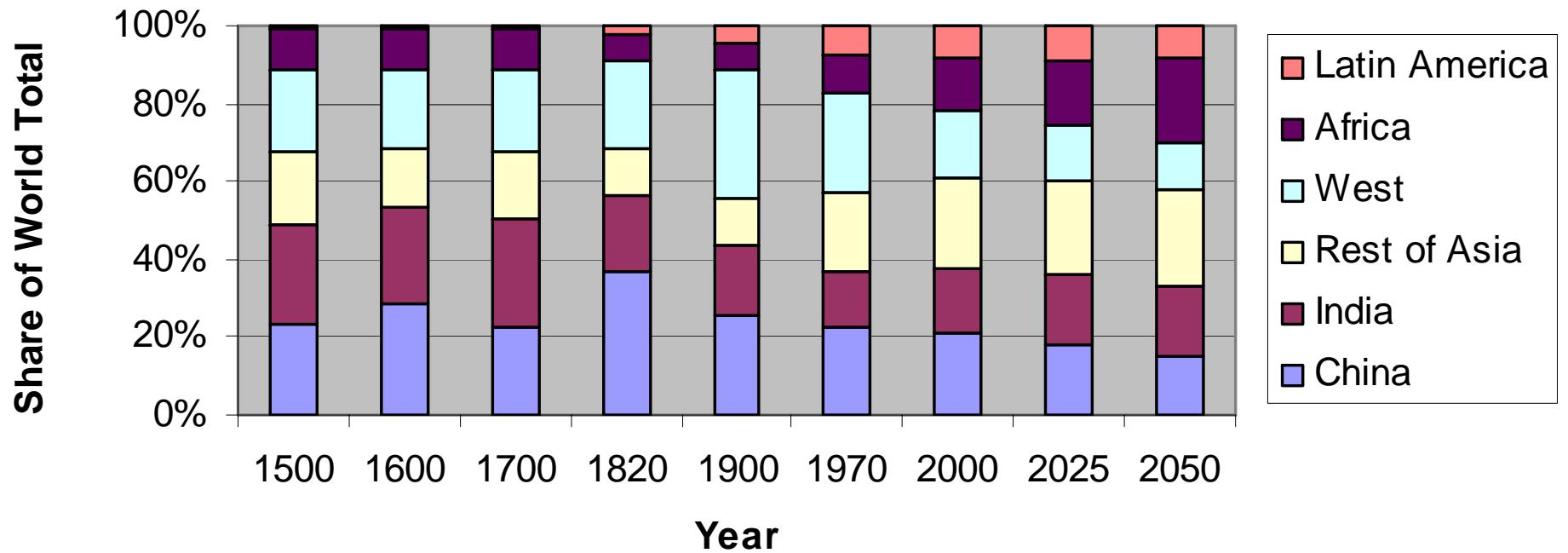
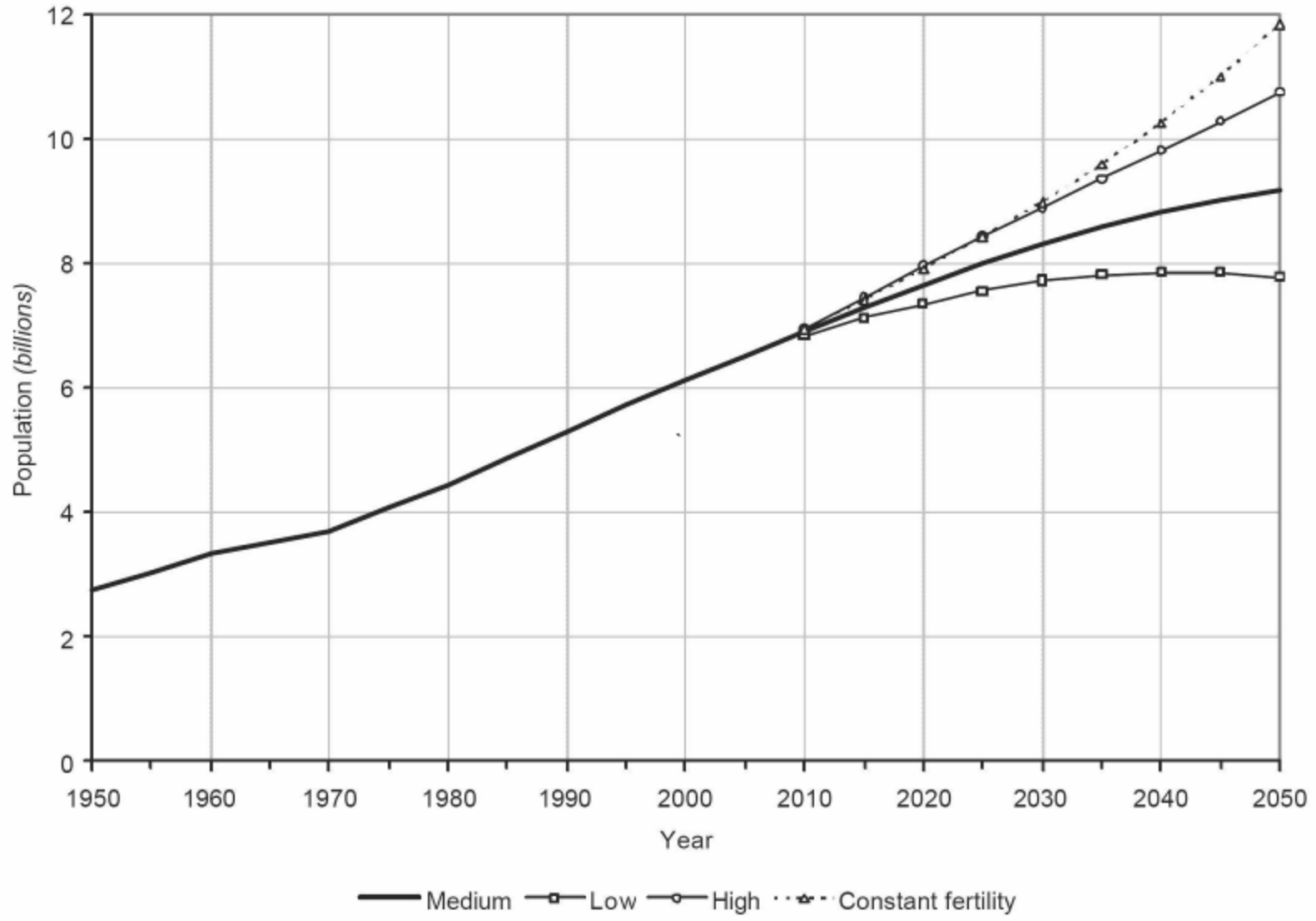
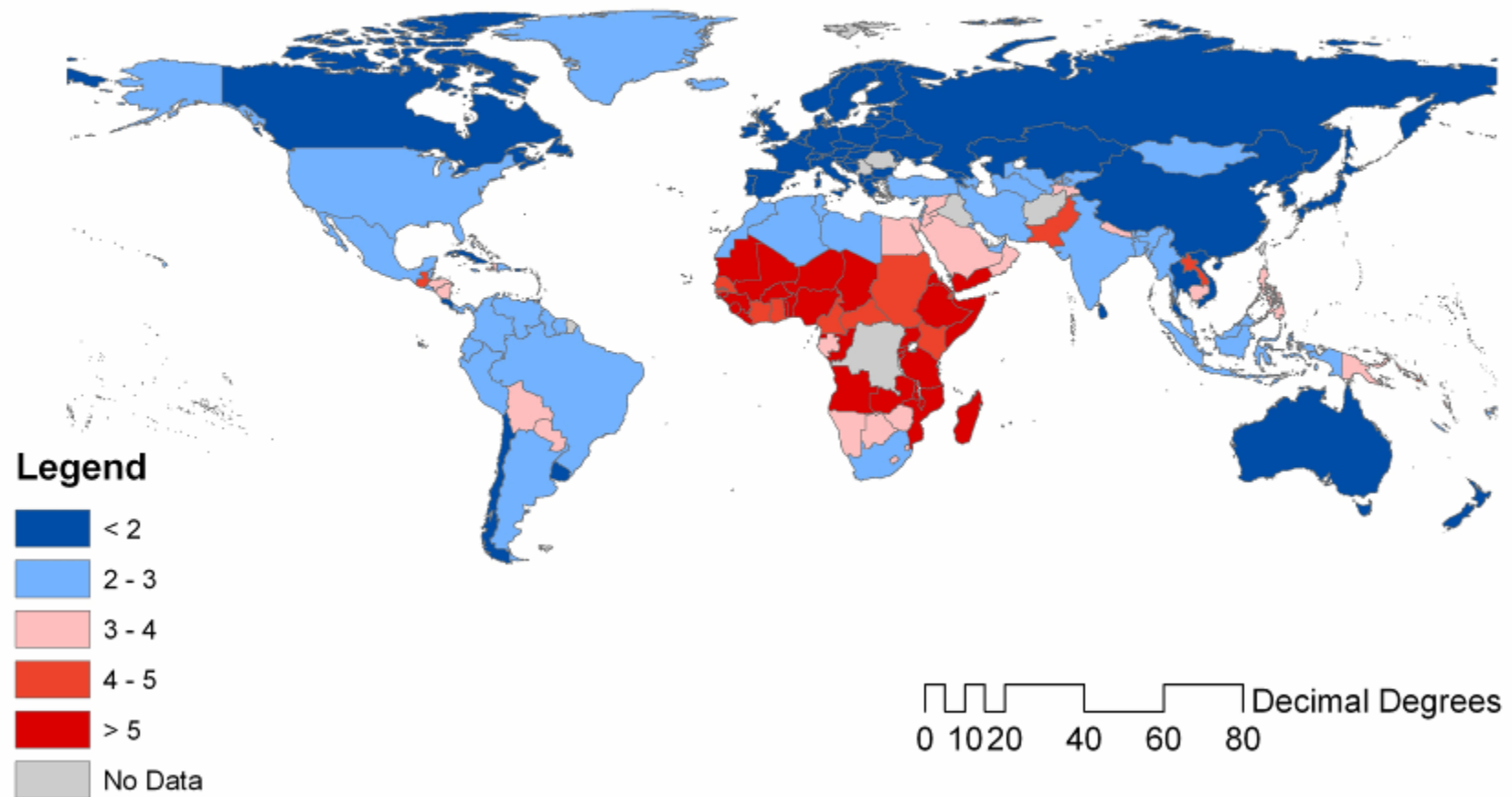


Figure 7.4: Population of the world, 1950-2050, according to different projection variants



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2007). World Population Prospects: The 2006 Revision. New York: United Nations.

# Figure 8.1: Total Fertility Rates in 2005

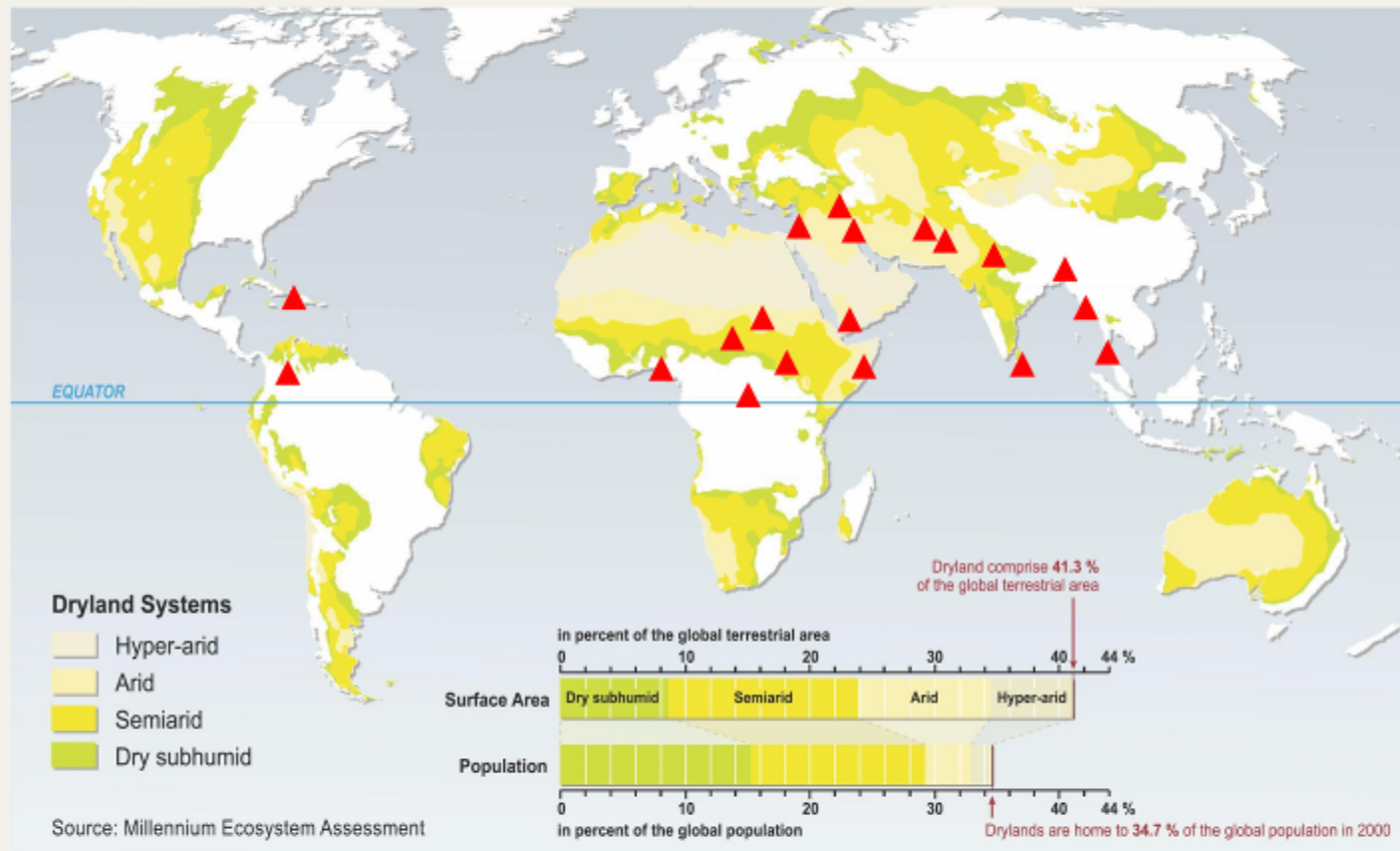


Source: Data from World Bank (2007)

Note: Where 2005 data is not available, most recent available data is used.

## Figure 5.1: Drylands and Conflict

Drylands include all terrestrial regions where the production of crops, forage, wood and other ecosystem services are limited by water. Formally, the definition encompasses all lands where the climate is classified as dry subhumid, semiarid, arid or hyper-arid. This classification is based on Aridity Index values<sup>†</sup>.



<sup>†</sup> The long-term mean of the ratio of an area's mean annual precipitation to its mean annual potential evapotranspiration is the Aridity Index (AI).

**Notes:** The map is based on data from UNEP Geo Data Portal (<http://geodata.grid.unep.ch/>). Global area based on Digital Chart of the World data (147,573,196.6 square km); Data presented in the graph are from the MA core database for the year 2000.

- ▲ Major episodes of political violence, defined as political violence involving the systematic use of lethal violence and terror by organized groups and/or states that substantially affect the society or societies that directly experience the armed conflict (resulting in at least 500 directly related fatalities substantial destruction of infrastructure and population displacements). Episodes may involve states, a state and non-state group, or non-state groups only, including inter-state and independence war, ethnic and revolutionary (civil) war, inter-communal warfare, genocide and communal massacres. Each episode is rated on a ten-point scale according to its total impact on the society or societies that are directly affected by the violence. (Center for Systemic Peace, 2007)