Overview

Global Challenges for Food and Agriculture

(Crop) Diversity – Where development, environment and agriculture need to meet

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1. Global Drivers of Change

(Population growth, Urbanization, Consumption patterns, Food Demand)

2. Natural Resource Management (Land, Water, Biodiversity) and Energy

3. Climate Change

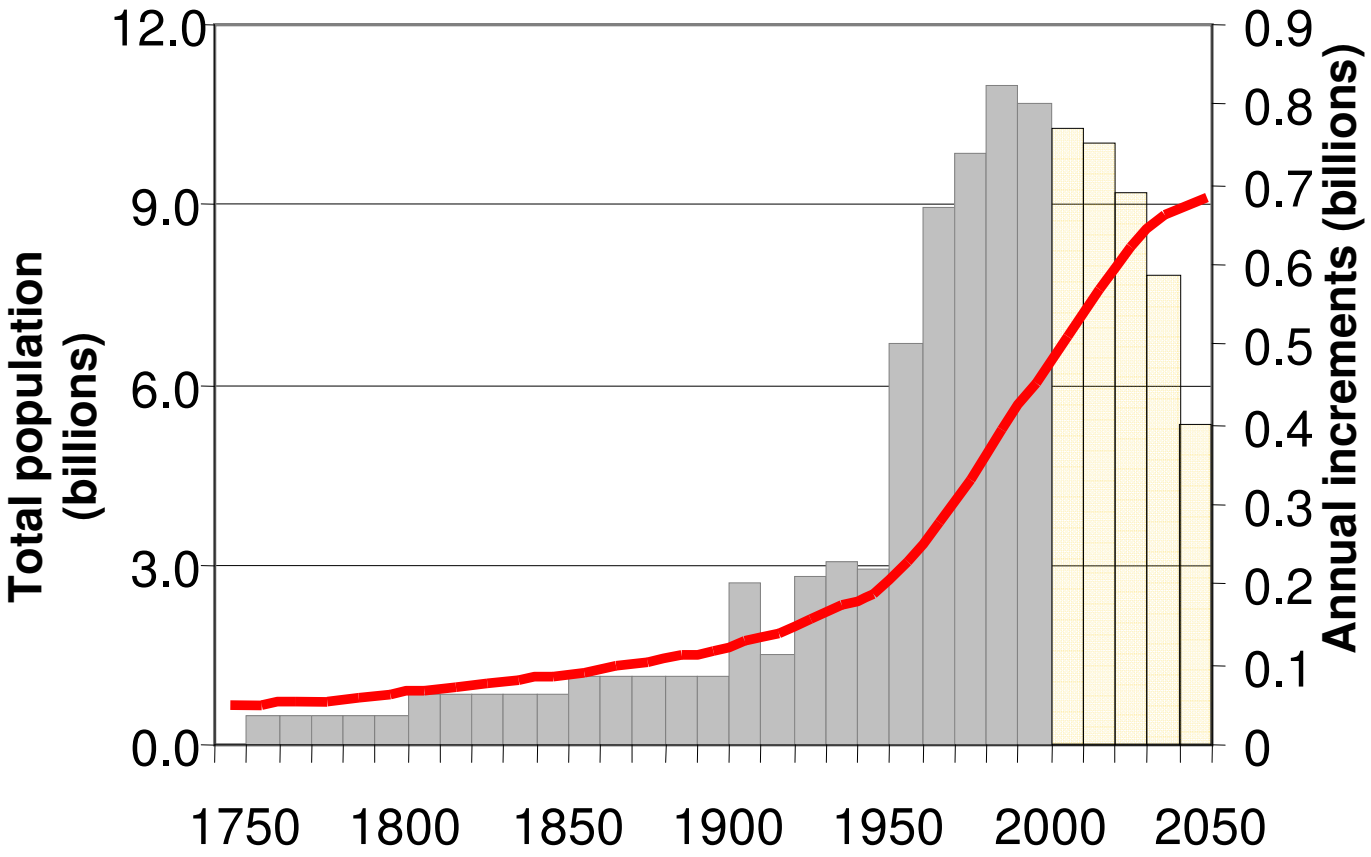
4. Soil Carbon Sequestration and Payments for Environmental Services

1. GLOBAL DRIVERS OF CHANGE

Population growth
Urbanisation
Food Demand

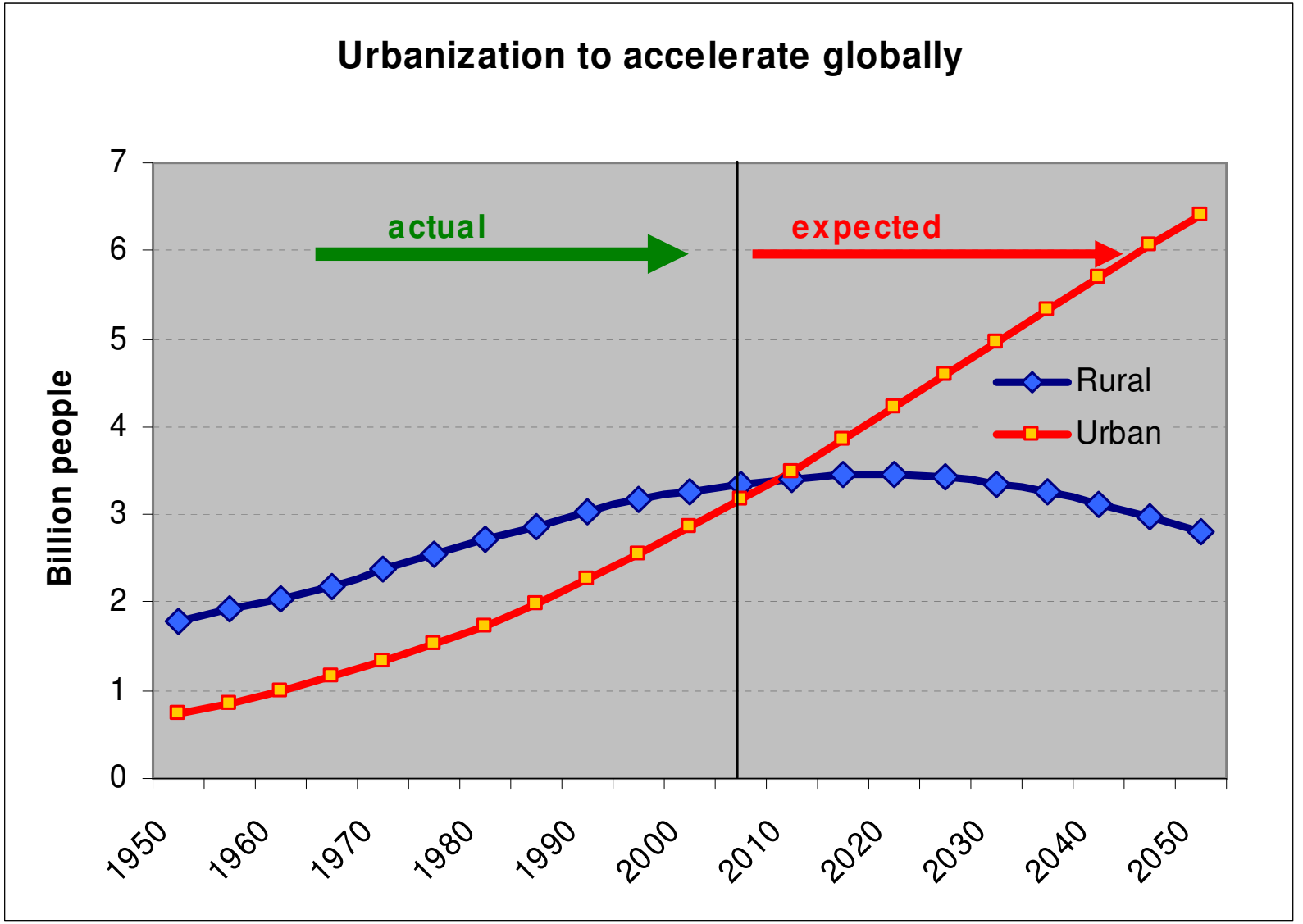
The main drivers of the long-term outlook

Slow-down in world population growth



Source: UN, World Population Assessment 2006

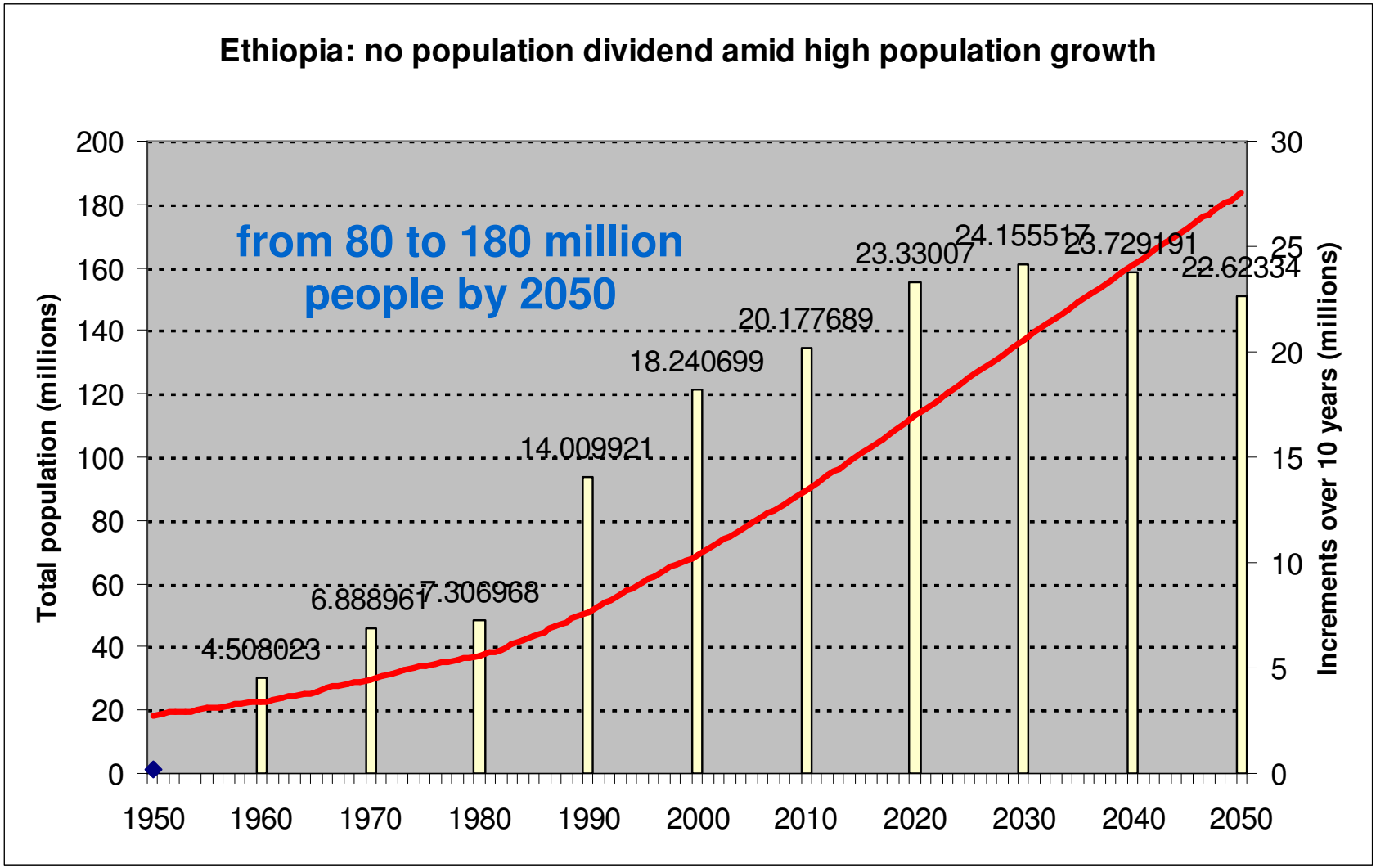
The main drivers of the long-term outlook



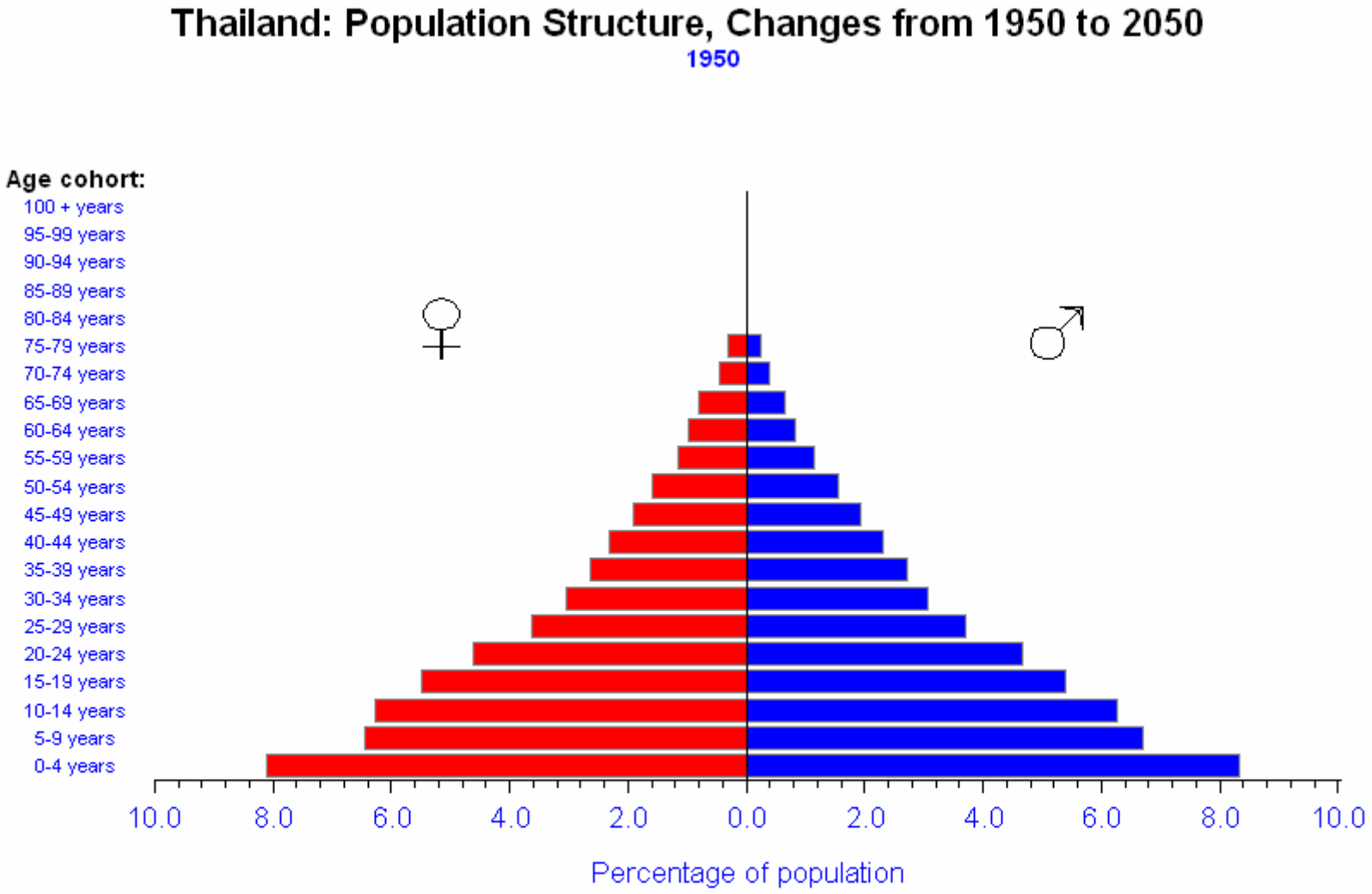
Source: UN, World Population Assessment 2007

The driving forces of demand to 2030

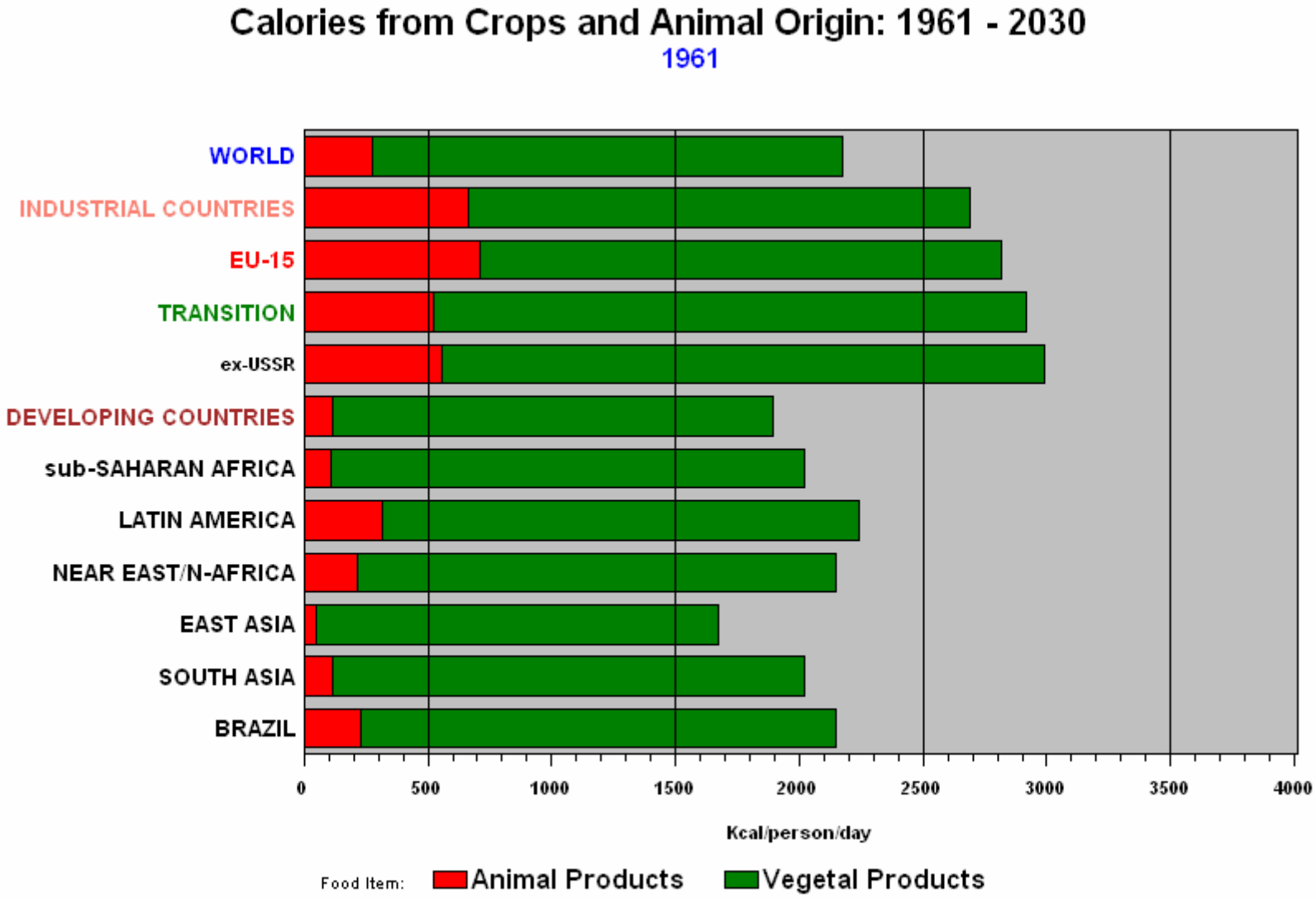
Food markets: drivers of the long-term outlook



The main drivers of the long-term outlook



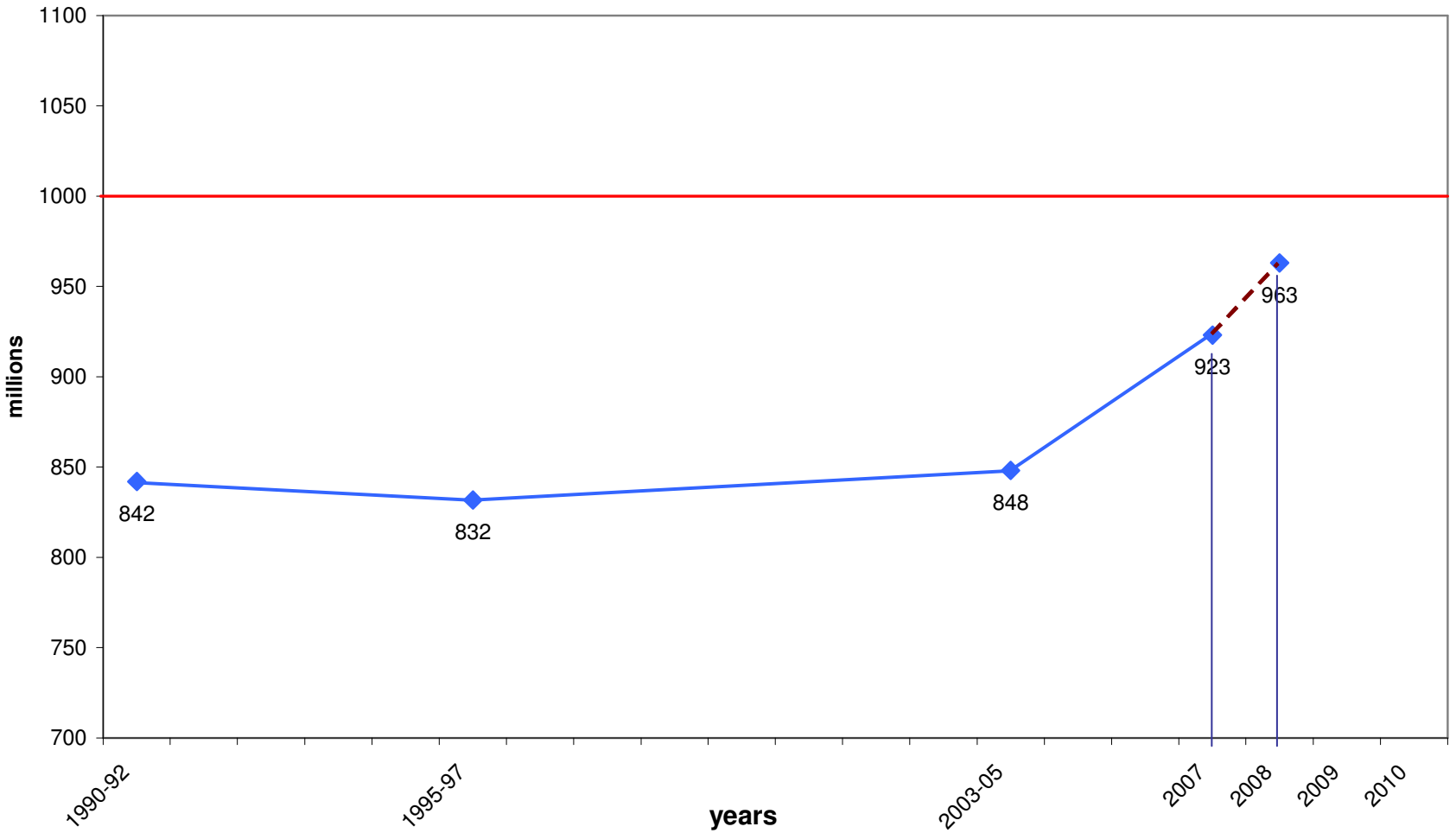
Based on: UN 2006 (http://esa.un.org/unpd/peps/WPP_CD-ROM/)
Josef Schmidhuber (2007)



Source: FAO, Global Perspectives Studies Group
Josef Schmidhuber(2006)

The number of undernourished is increasing

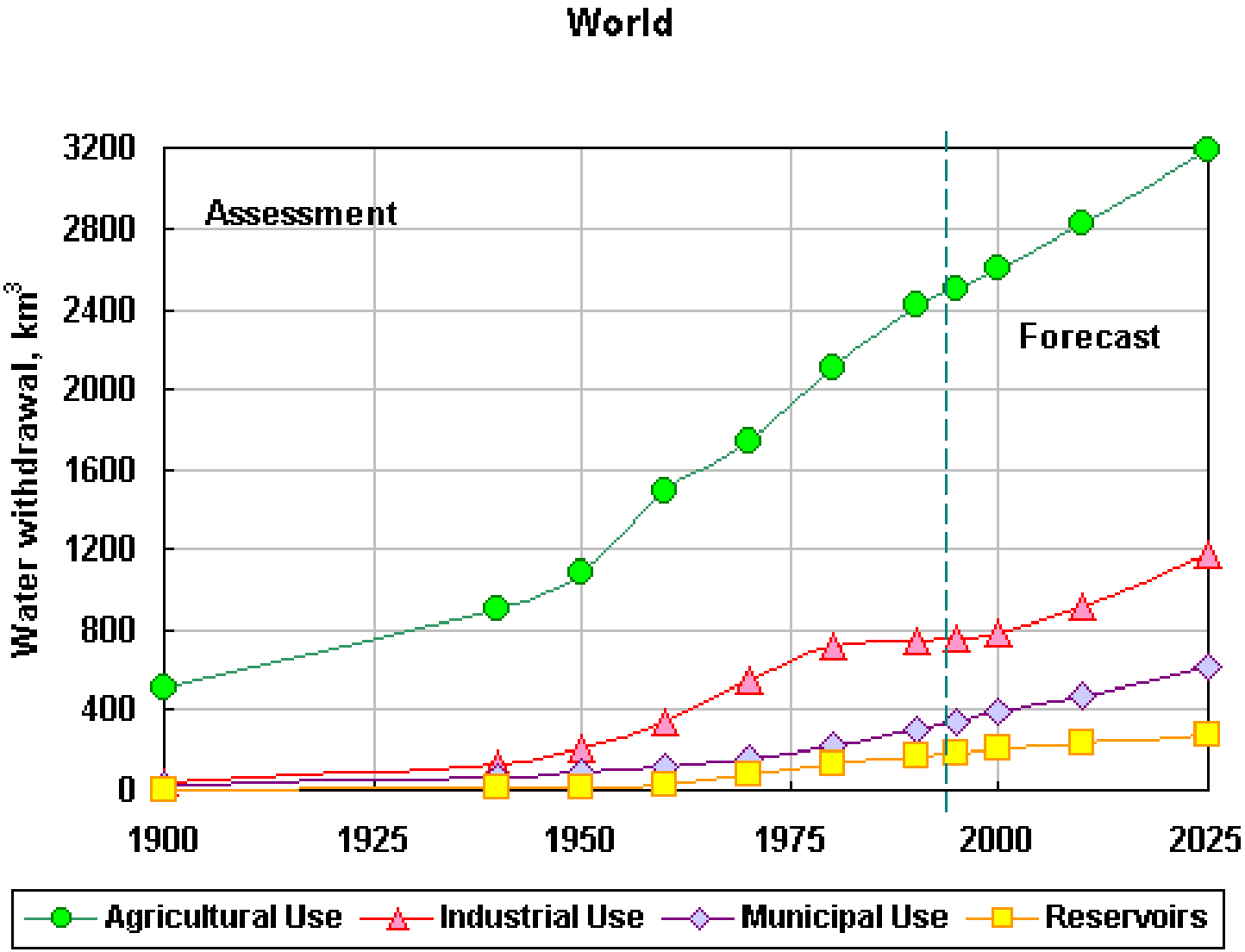
numbers of undernourished in the world 1990-92 to 2008 (millions)



Source: FAO

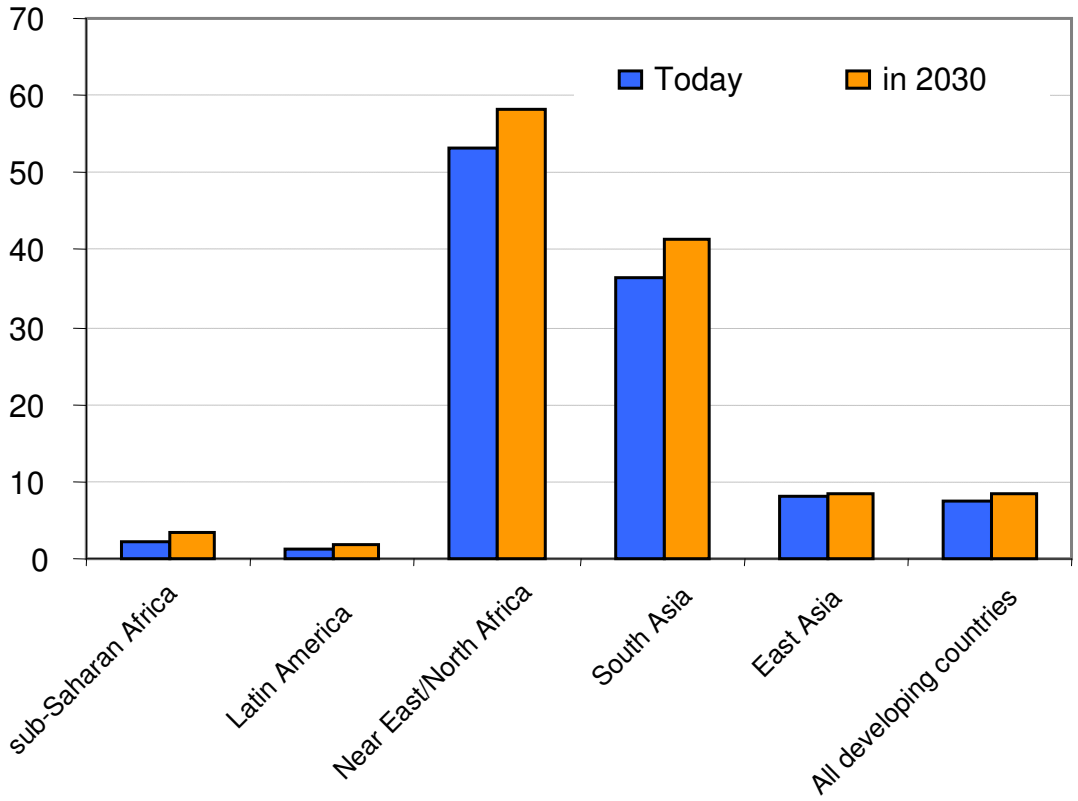
2. NATURAL RESOURCES

(Water
Land
Governance for Biodiversity)
and Energy


World
Assessment
Forecast
Water withdrawal, km3
3200
2800
2400
2000
1600
1200
800
400
0
1900
1925
1950
1975
2000
2025
Agricultural Use
Industrial Use
Municipal Use
Reservoirs

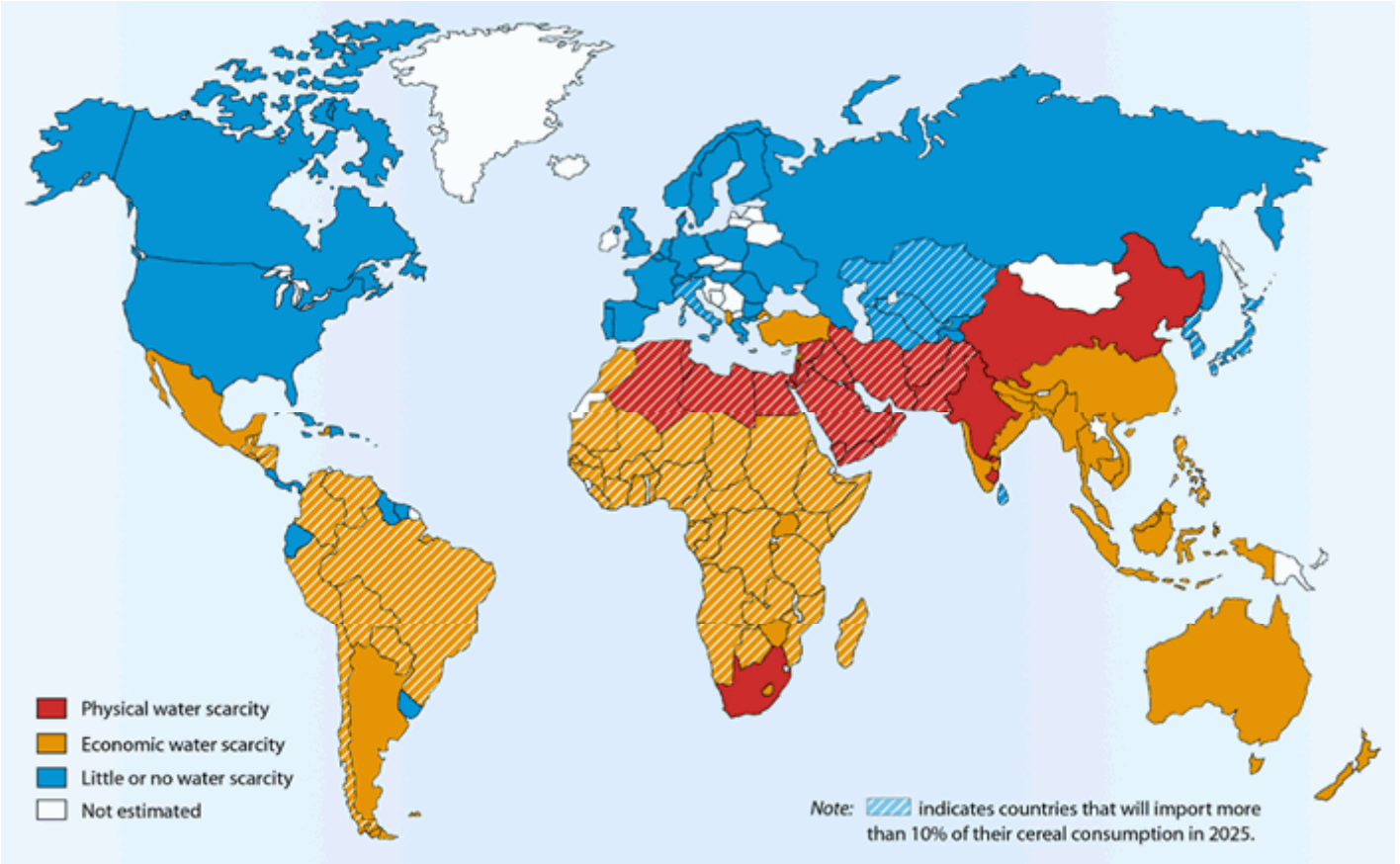
Is there enough water?

Irrigation water withdrawal as a share of renewable water resources (%)

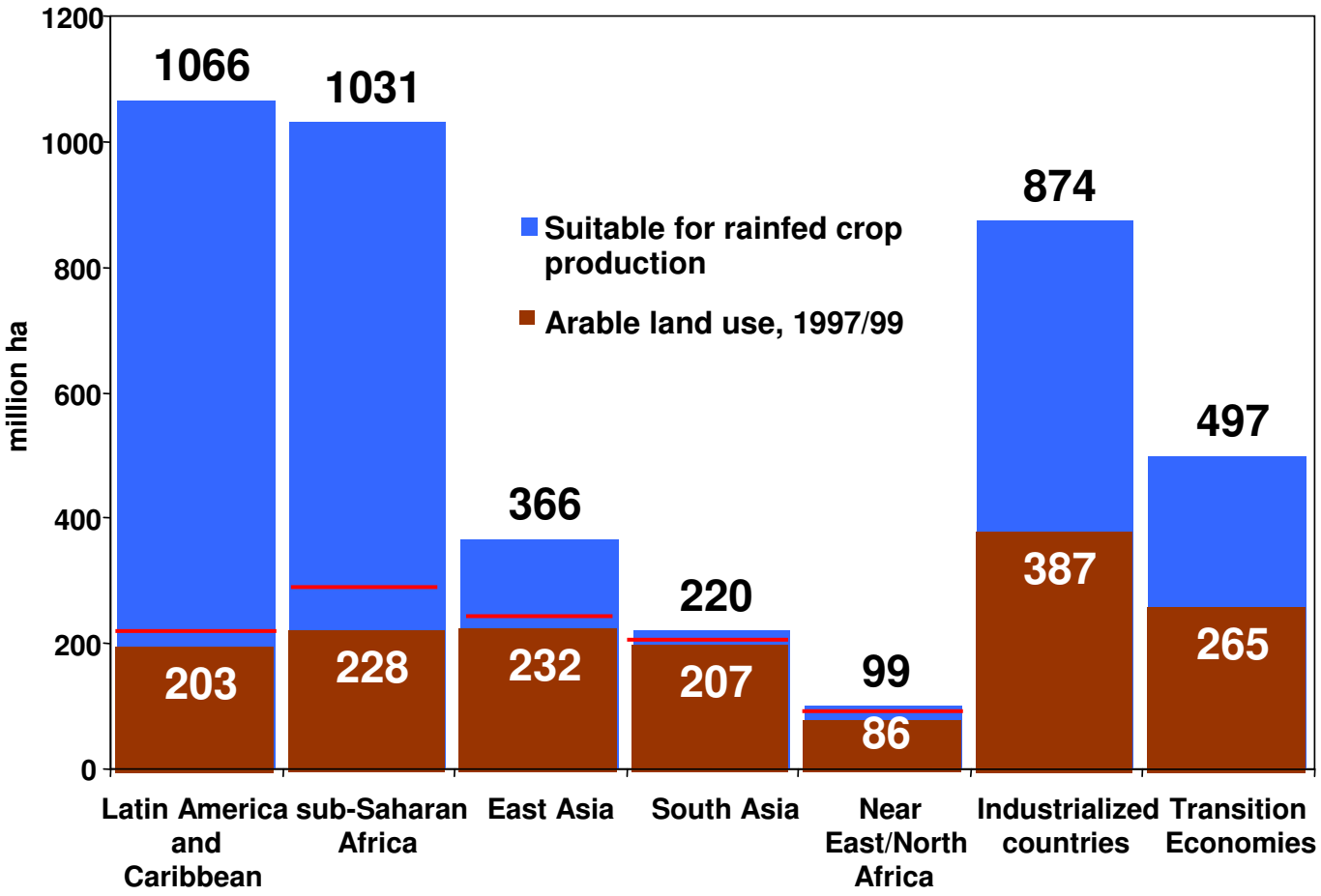


Source: Global Perspective Studies Unit, FAO

Global distribution of water scarcity

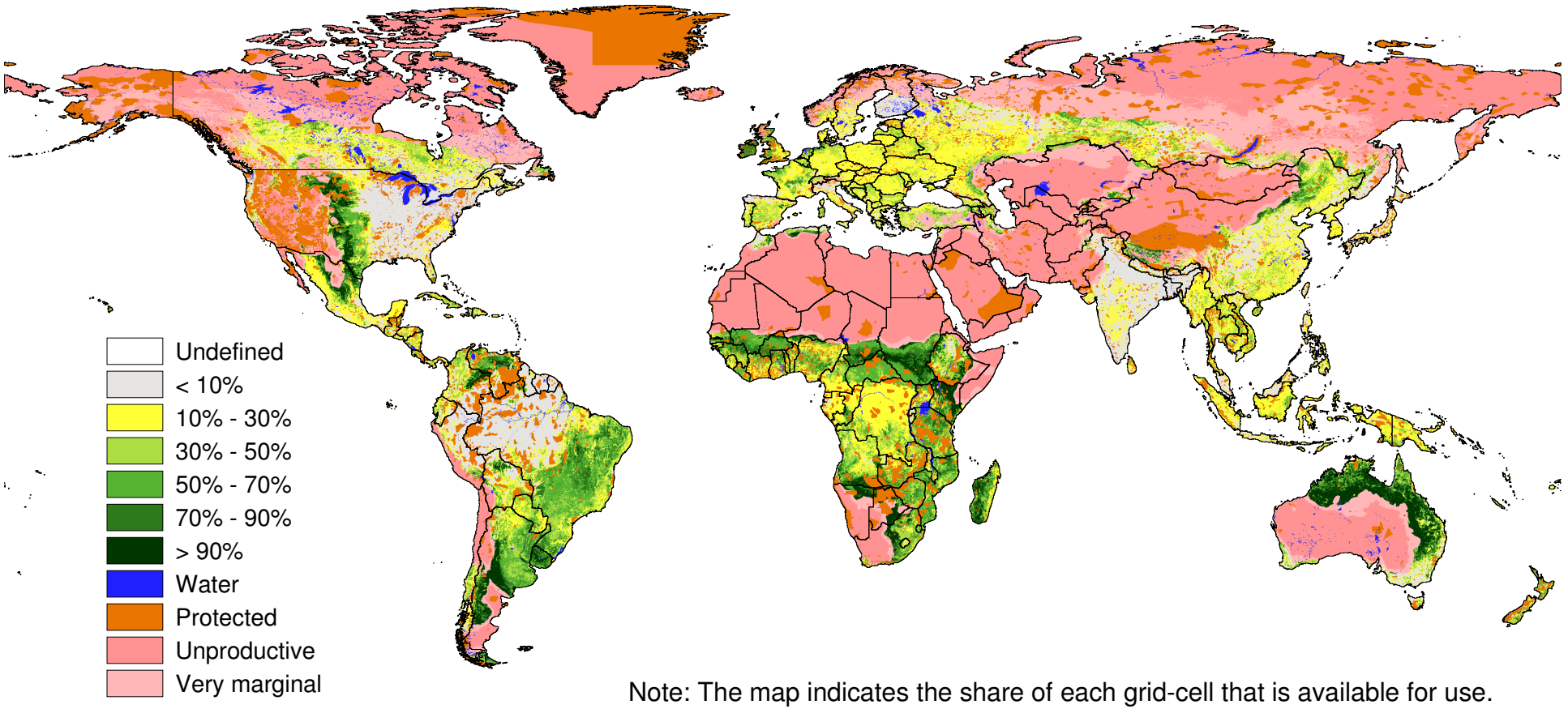


How much land is in use, how much is available now and in 2030?



Source: Global Perspective Studies Unit, FAO

... excluding climatically unsuitable or very marginal areas



Note: The map indicates the share of each grid-cell that is available for use.

Source: GAEZ 2007, IIASA-LUC/FAO

The Global Governance for Genetic Resources for Food

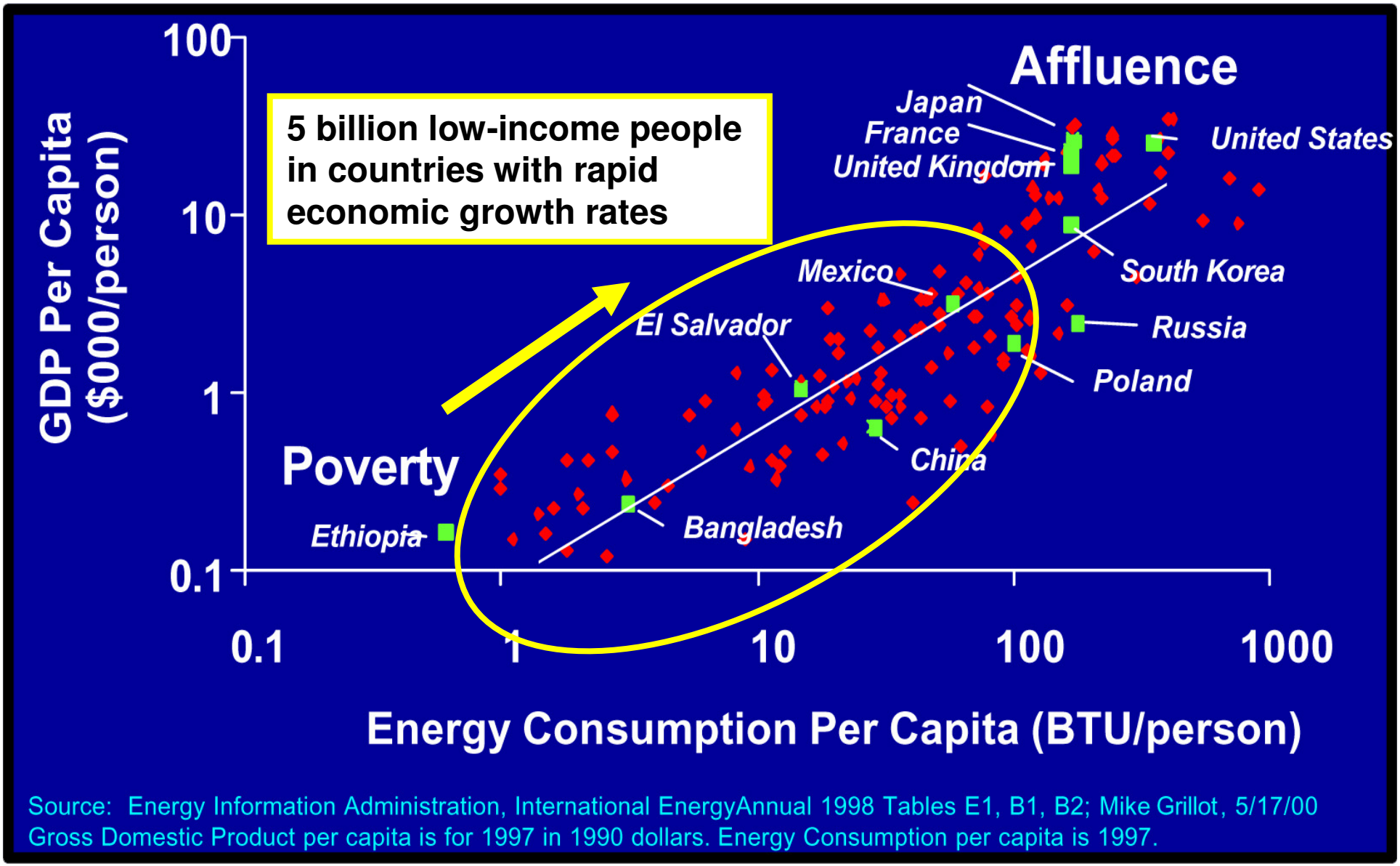
- Genetic Resources for Food and Agriculture (Int. Treaty; Crop Diversity Trust; Svalbard; FAO Commission)
- Biodiversity (Convention on Biological Diversity)
- Climate Change (UN Framework Convention on Climate Change)
- The Multi-year Programme of Work for Biodiversity for Food and Agriculture (2008-2017) in FAO

The FAO Multi-year Programme of Work

Major outputs and milestones

	12	13	14	15	16
PGRFA	SoW update	GPA update			SoW update
AnGR	Follow-up Interlaken		Review		SoW update
AqGR		Review	SoW	Elements of *Code*	
FoGR	Key issues Analysis		SoW		
Mo's/ Inv.	Review of scoping Study		Review key issues in MO's and Inv.	Review of work on MO's and Inv.	

Energy Consumption and Income are Linked



Source: Energy Information Administration, International EnergyAnnual 1998 Tables E1, B1, B2; Mike Grillot, 5/17/00
Gross Domestic Product per capita is for 1997 in 1990 dollars. Energy Consumption per capita is 1997.

3. Climate Change

Projected impacts of climate change

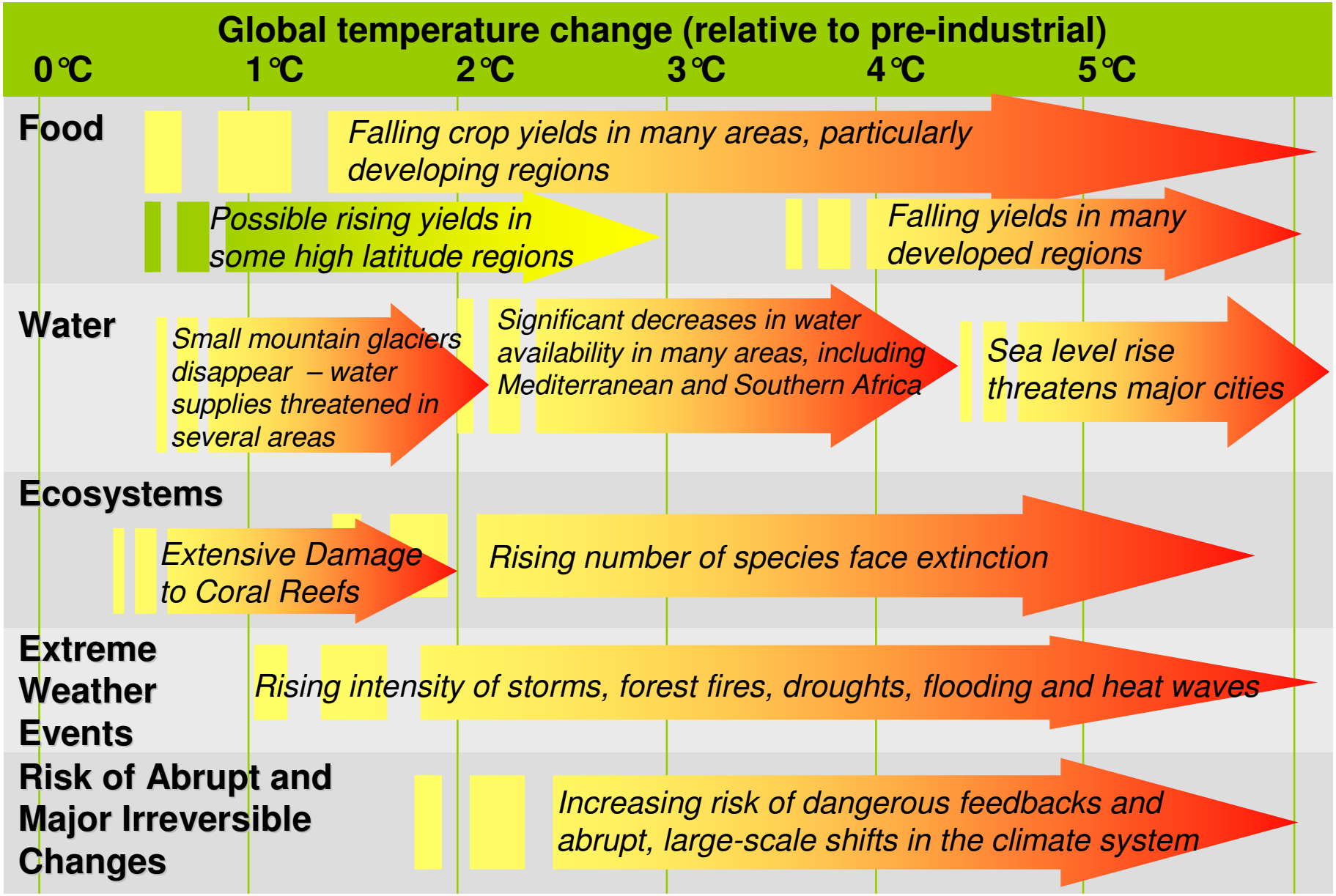
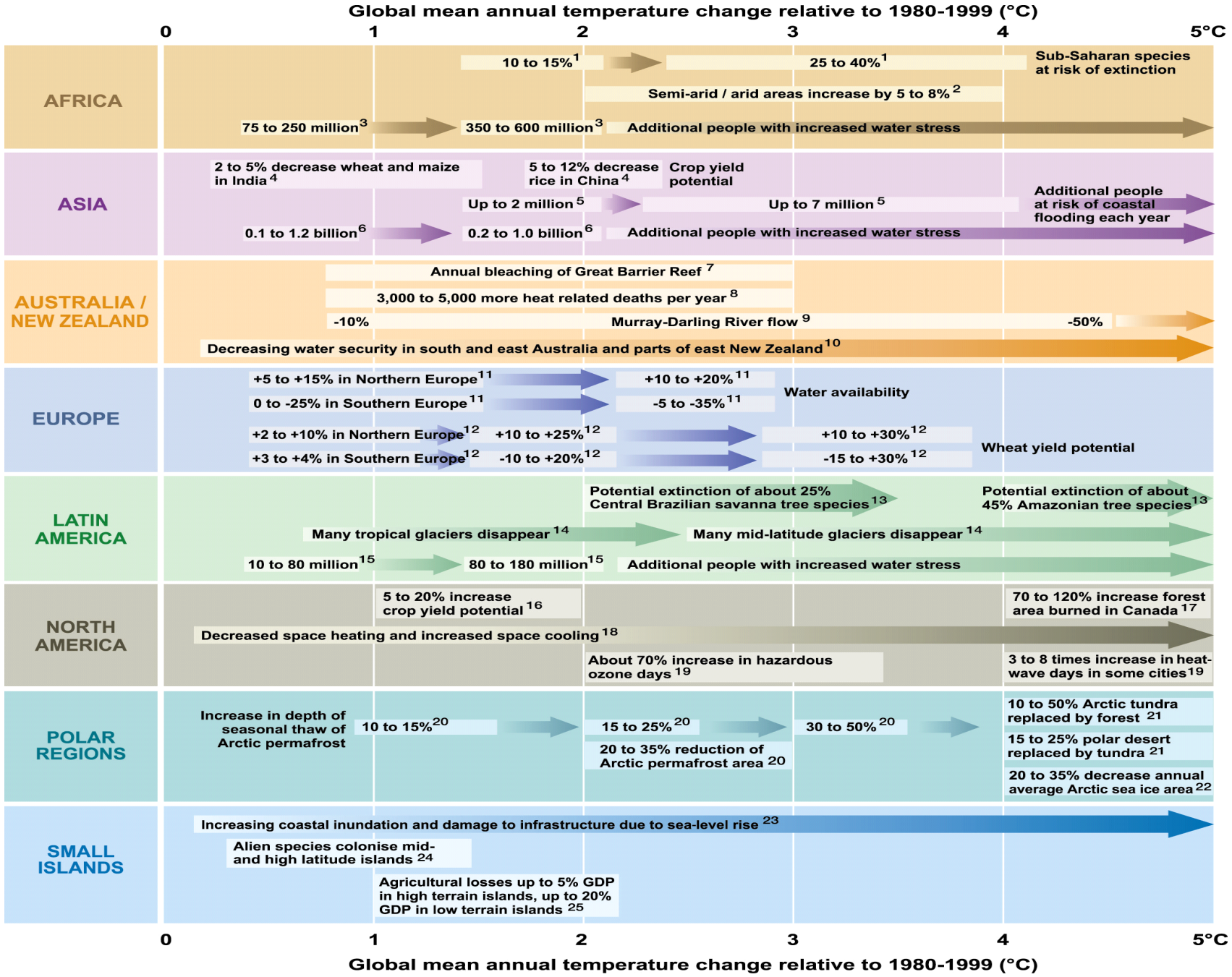


Table TS.4. Examples of regional impacts



Agriculture-related GHG Emissions

Agriculture contributes

- 22 % of total anthropogenic CO_2 emissions
- 51 % of CH_4 emissions
- 78 % of N_2O emissions
- almost 35 - 40 % of CO_2 equivalent emissions*

* taking into account land use change (important) and fossil fuel use (less important)

4. Soil Carbon Sequestration and Payments for Environmental Services

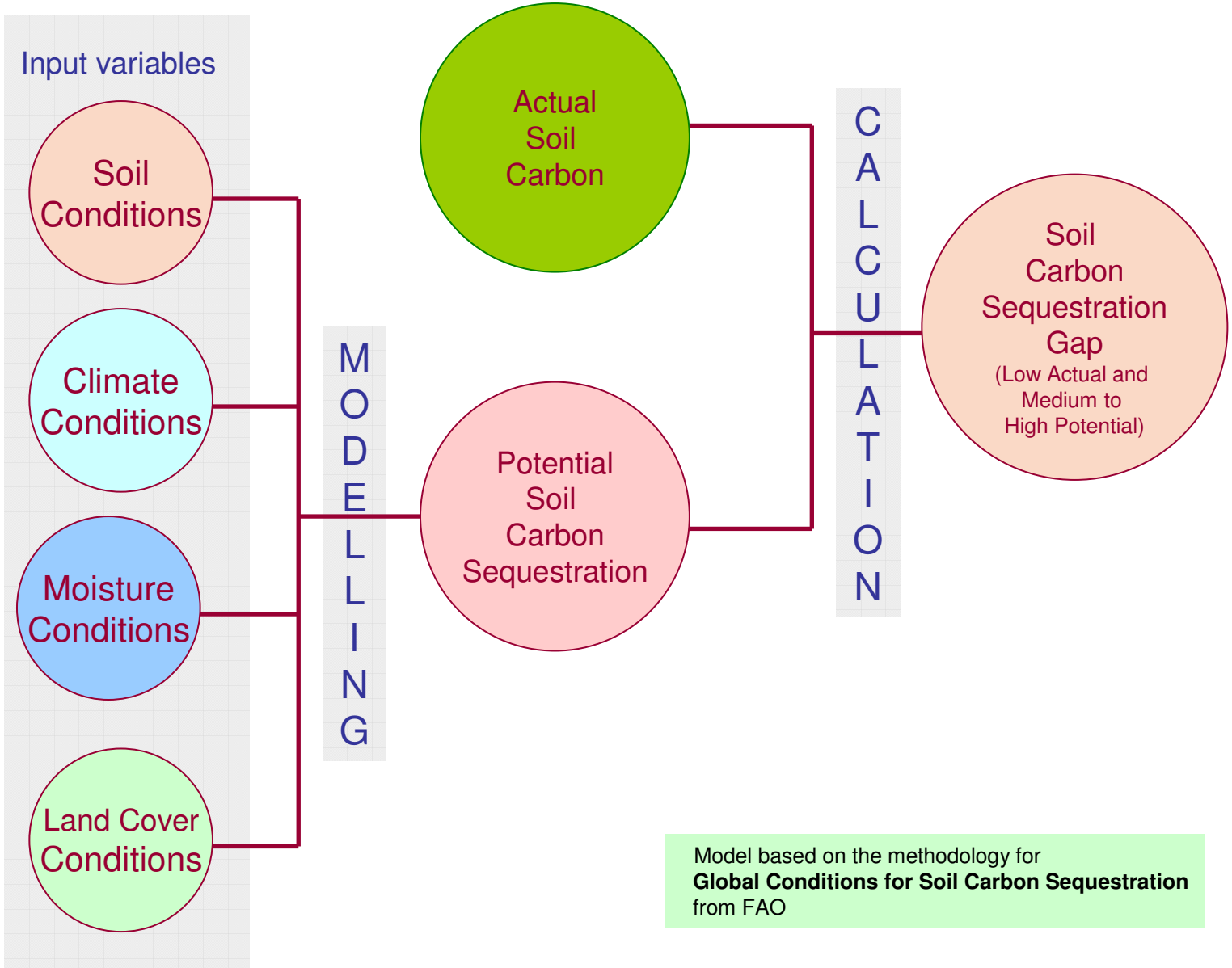
Can we use the new financial mechanisms in UNFCCC (CDM, Emission Trading Schemes)

1. to sequester carbon in the soil,

2. to improve World Food Security,

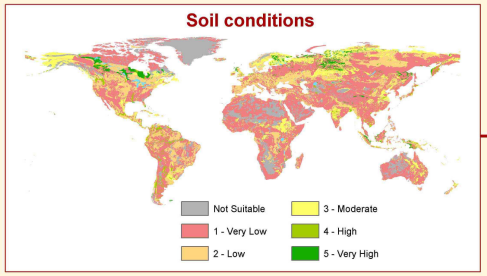
3. to protect and use Biodiversity?

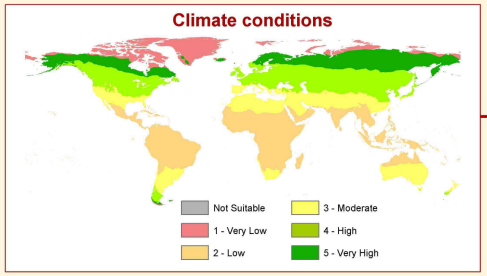
Estimating Soil Carbon Gap methodology

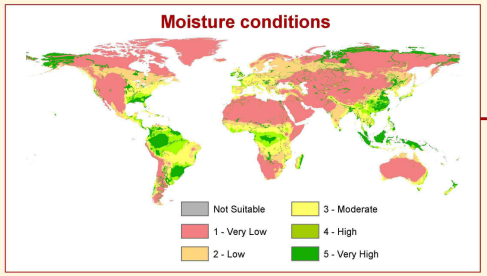


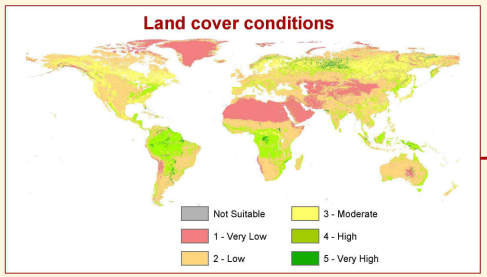
Model based on the methodology for
Global Conditions for Soil Carbon Sequestration
from FAO

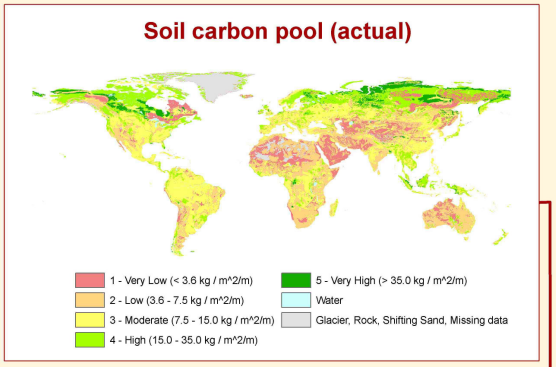
Estimating Soil Carbon gap
SOFA 2007

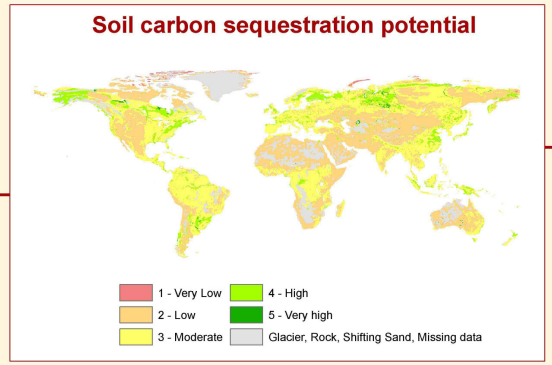


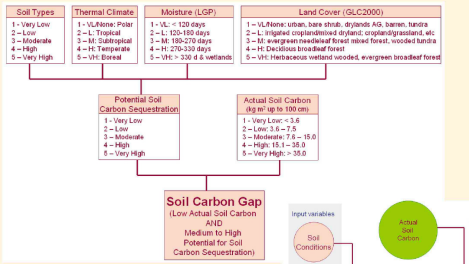




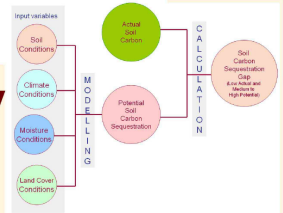




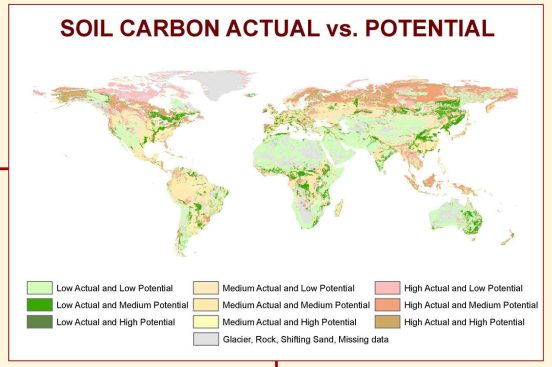


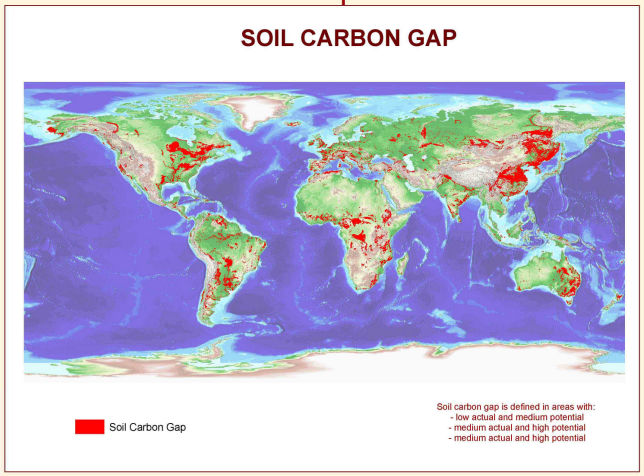


Methodology



Estimating Soil carbon gap SOFA 2007





Model based on the methodology for Global Conditions for Soil Carbon Sequestration, FAO

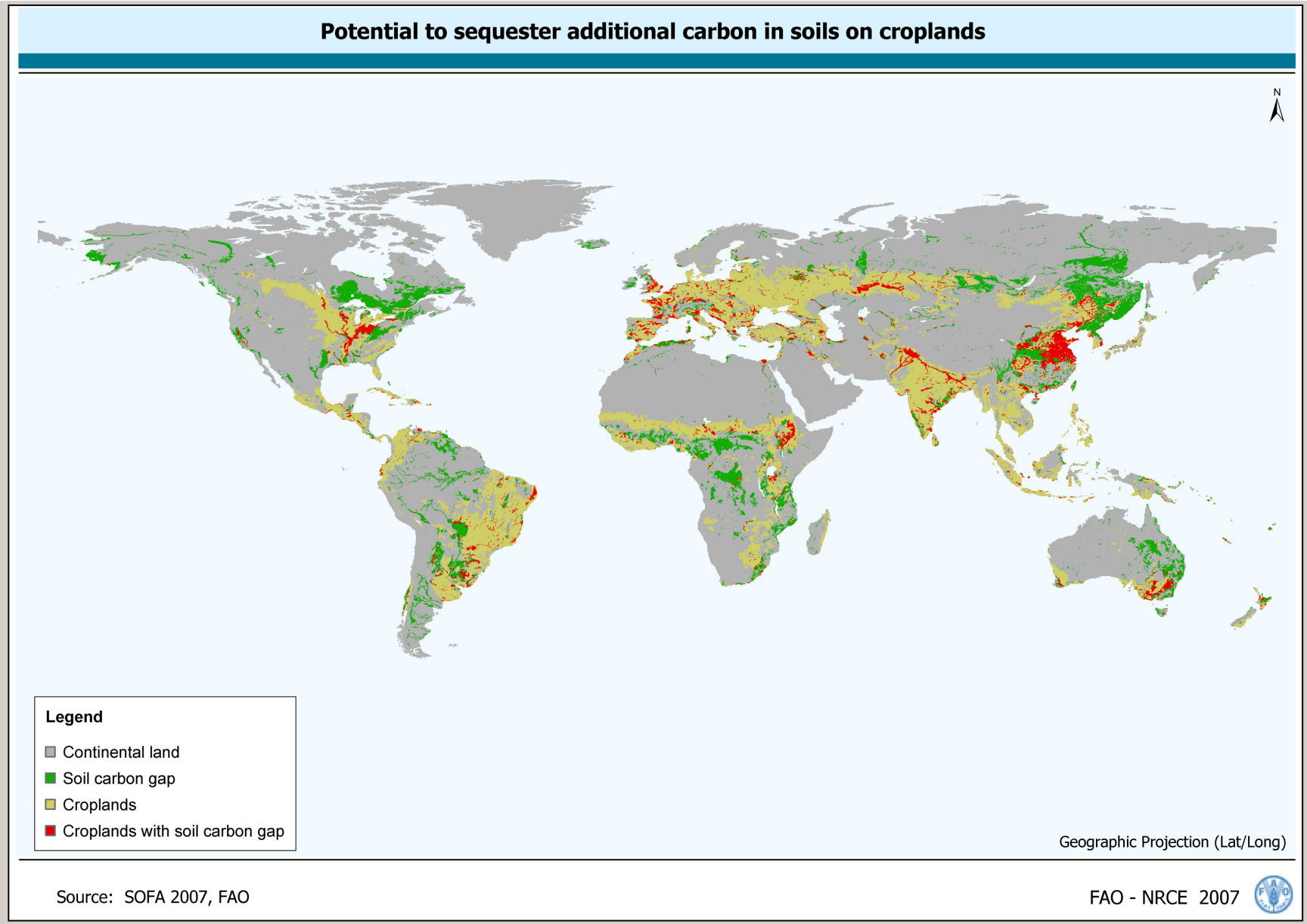
Created on July 2007 from NRCE in partnership with AGL and ESA (FAO) in framework of State Of Food and Agriculture 2007 (SOFA 2007)

Reference System: Geographic Projection, Datum WGS 84, Spatial resolution: 5 arc-minute, Coverage: Global

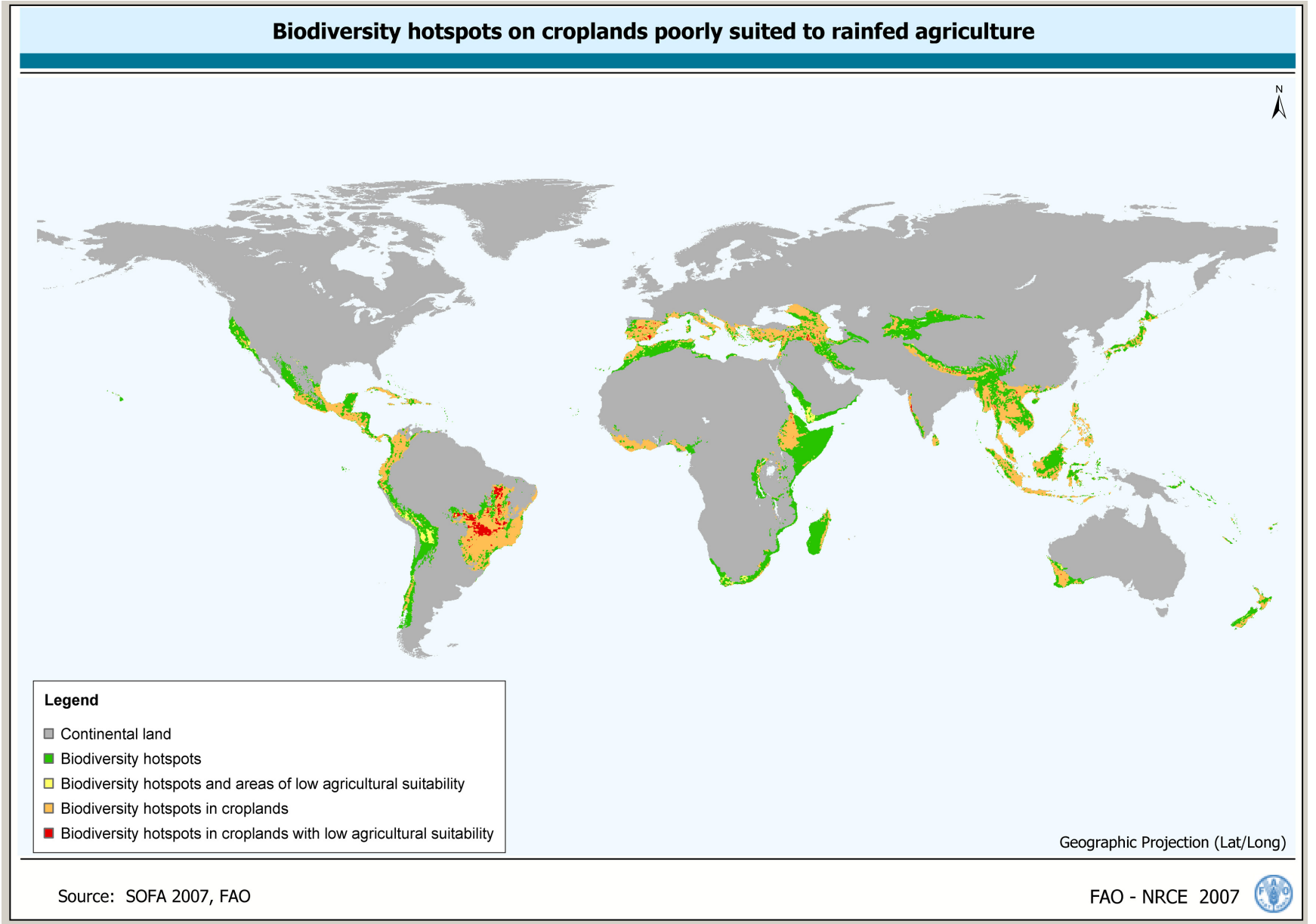
Natural Resources Assessment and Management (NRCE)

Rome, July 2007

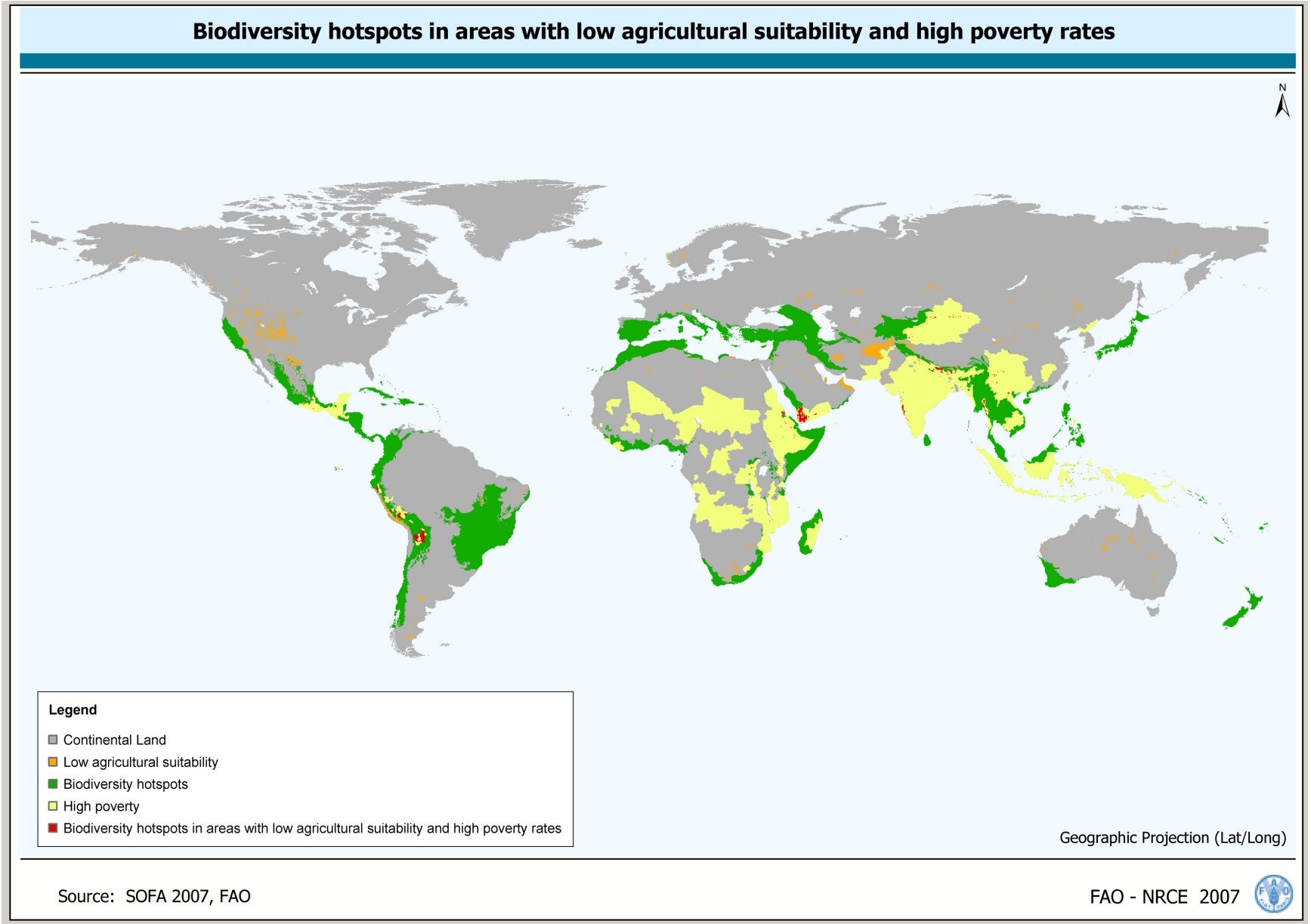
Potential to sequester additional carbon in Soils on croplands



Biodiversity hotspots on croplands poorly Suited to rainfed agriculture

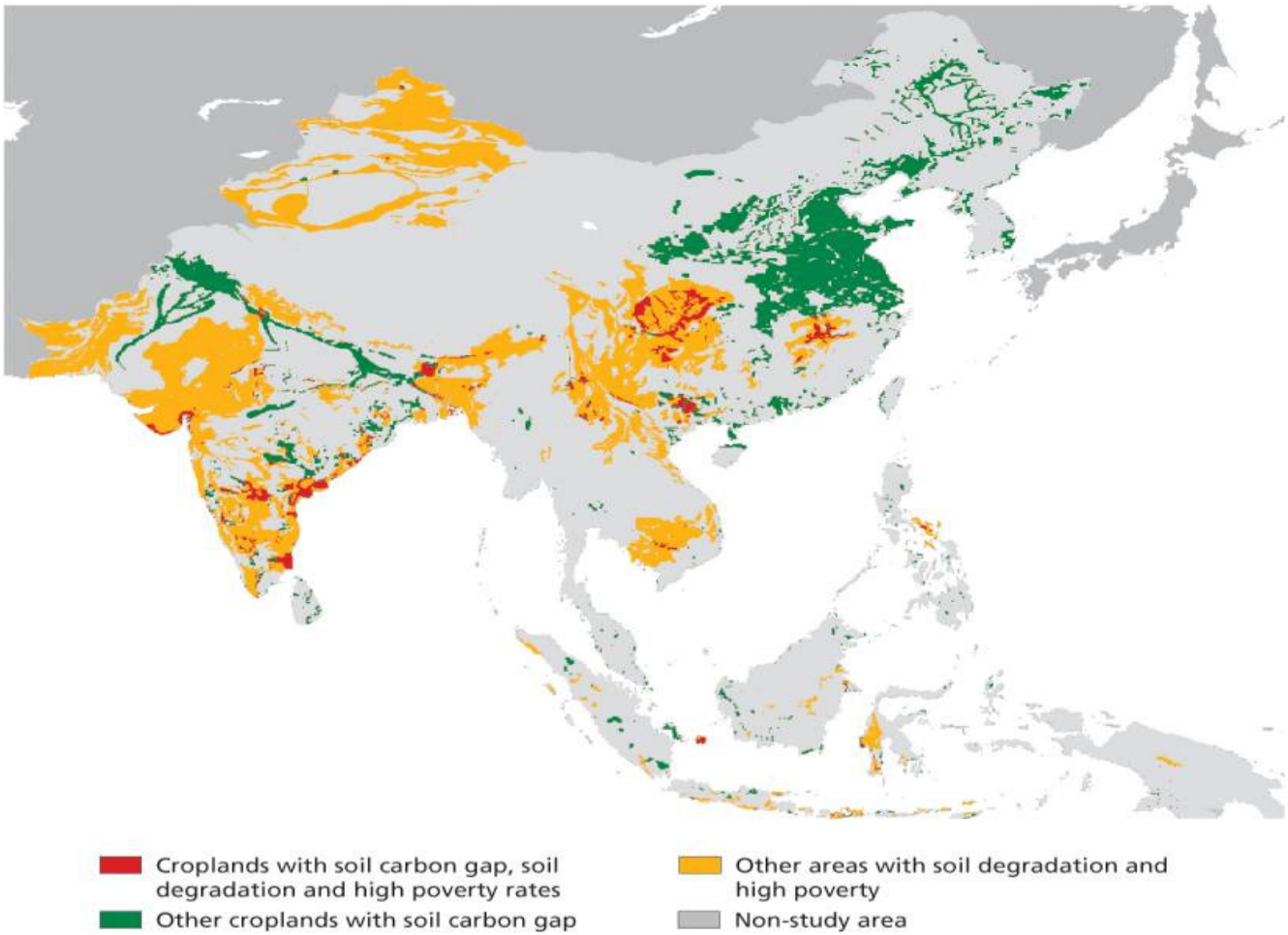


Biodiversity hotspots in areas with low agricultural Suitability and high poverty rates



Where could the poor benefit from sequestering soil carbon on croplands?

MAP 8
Highly degraded croplands with soil carbon sequestration potential and high poverty rates



FINAL REMARKS (I)

- Climate change is a major driver of genetic erosion (not only) in agriculture.
- National conservation strategies of genetic resources have still not included climate change in their planning and international cooperation and support.
- Sustainable use strategies of genetic diversity are key to adapt our food production, but they are long-term strategies, investment is required NOW.

FINAL REMARKS (II)

- Strengthening the existing global framework on agricultural genetic resources would be an efficient mechanism to confront climate change in food and agriculture.
- Targeted investments in existing initiatives and policy instruments could generate win-win strategies in climate change adaptation, biodiversity conservation and food security.

FINAL REMARKS (III)

- Sectorial approaches are however not sufficient. Coordination across sectors is needed to identify synergies and trade-offs, and enhance participation in designing successful responses to emerging challenges.
- Innovative inter-sectorial mechanisms of cooperation are needed for tackling new challenges. At international level the Commission's Multi-Year Programme of Work could offer an excellent platform to cooperate with the climate change community.

THANK YOU