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World Water Situation

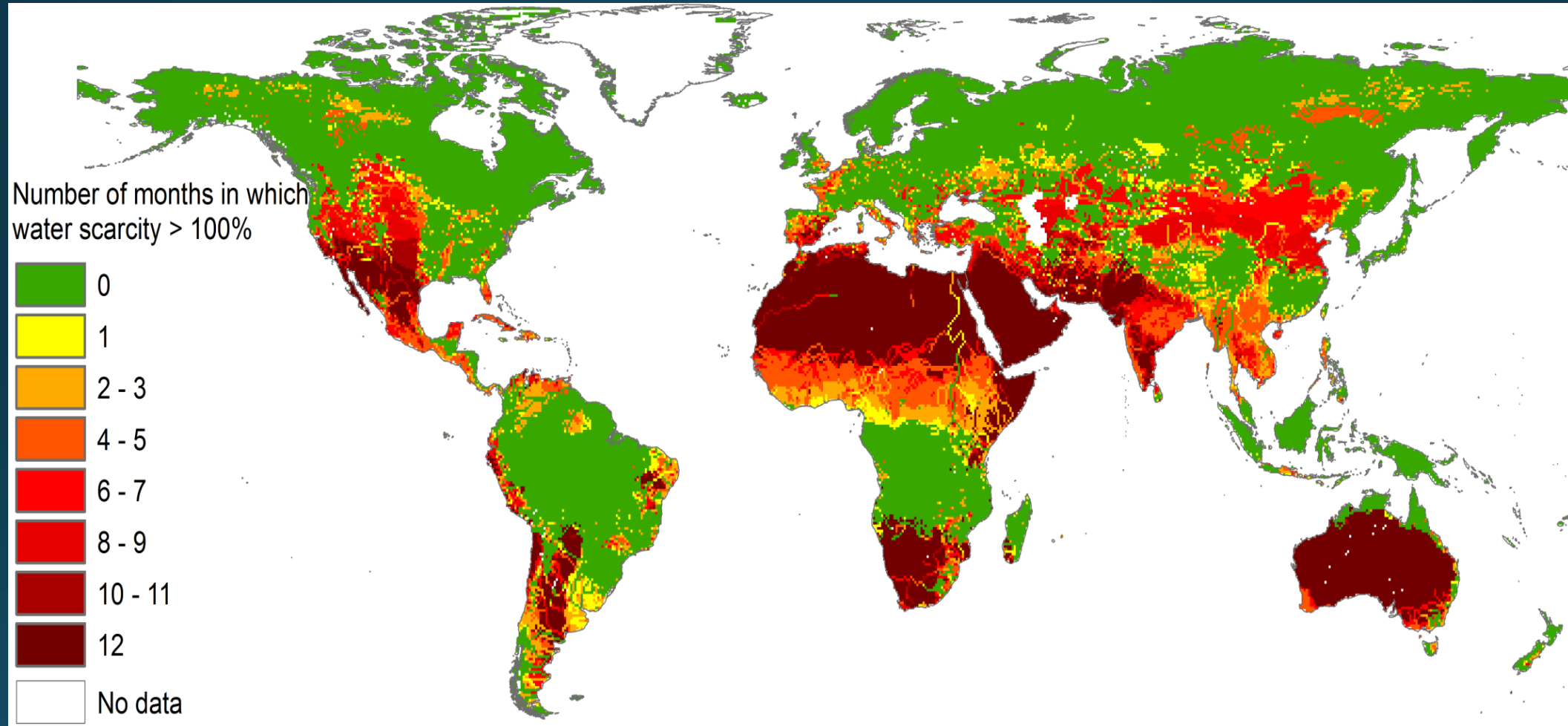
World context

- Poverty
- Literacy
- Hunger

A water-scarce planet

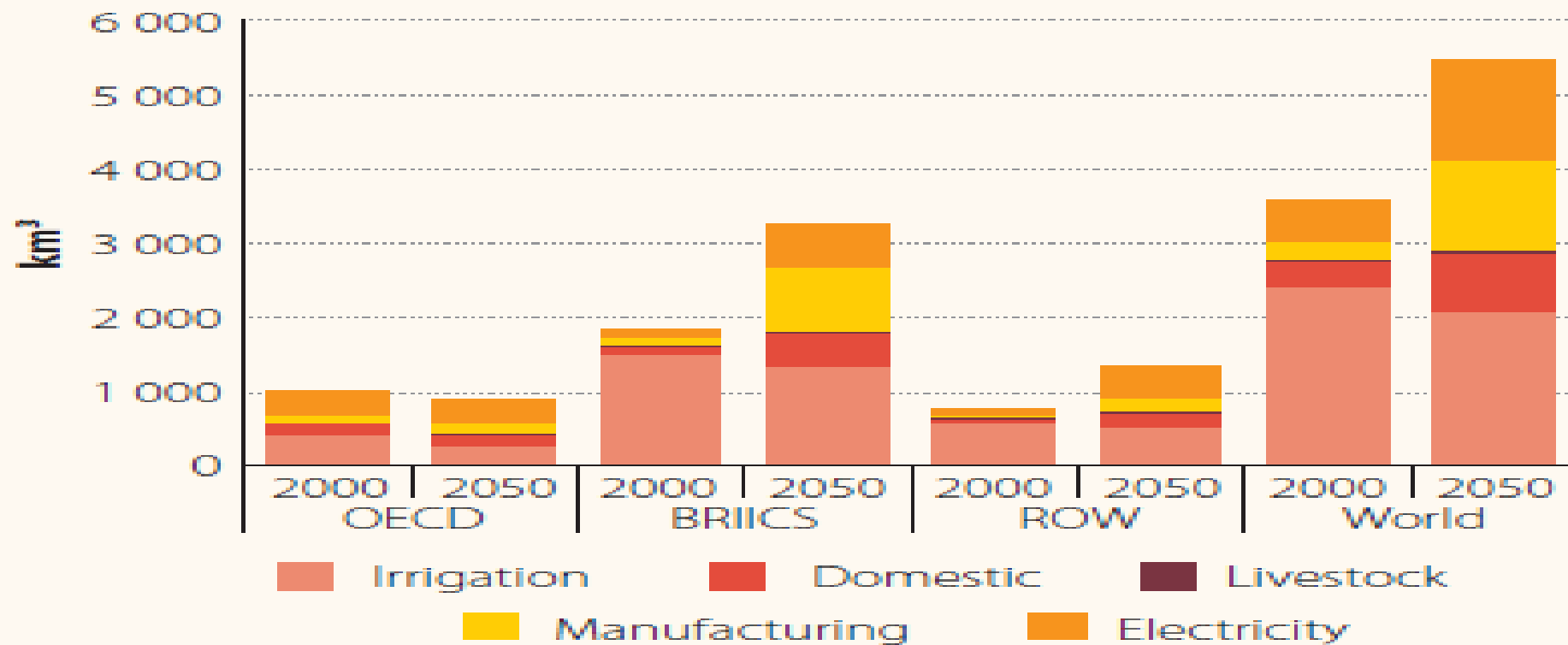
- 97% saltwater
- Remaining 3% (40 m cubic kilometers)
 - 2% freshwater: glaciers and icecaps
 - 0.7% groundwater
 - Rest: lakes, soil, atmosphere, rivers and living organisms

Blue water scarcity above 100%: months

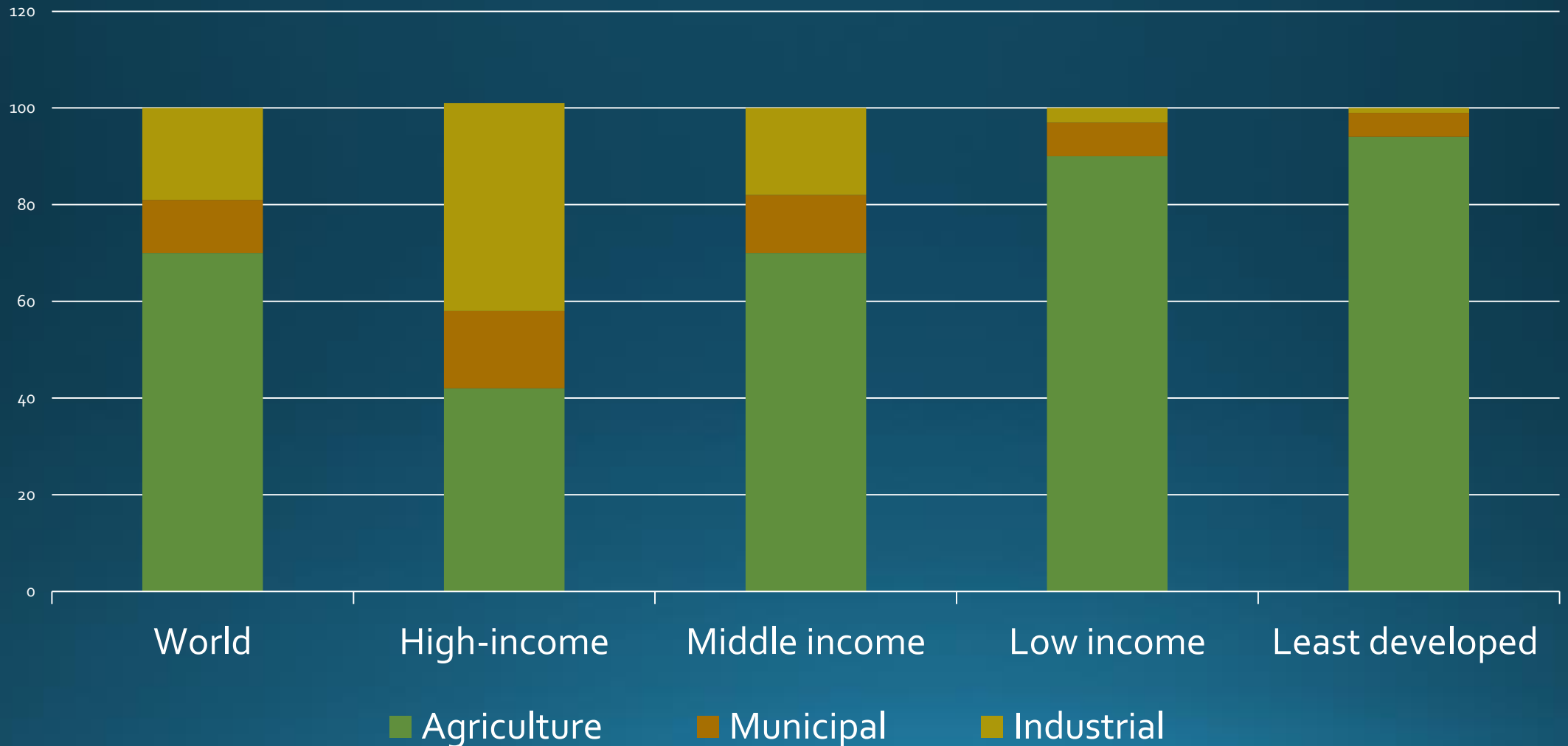


Demand is increasing

Global water demand (freshwater withdrawals): Baseline Scenario, 2000 and 2050



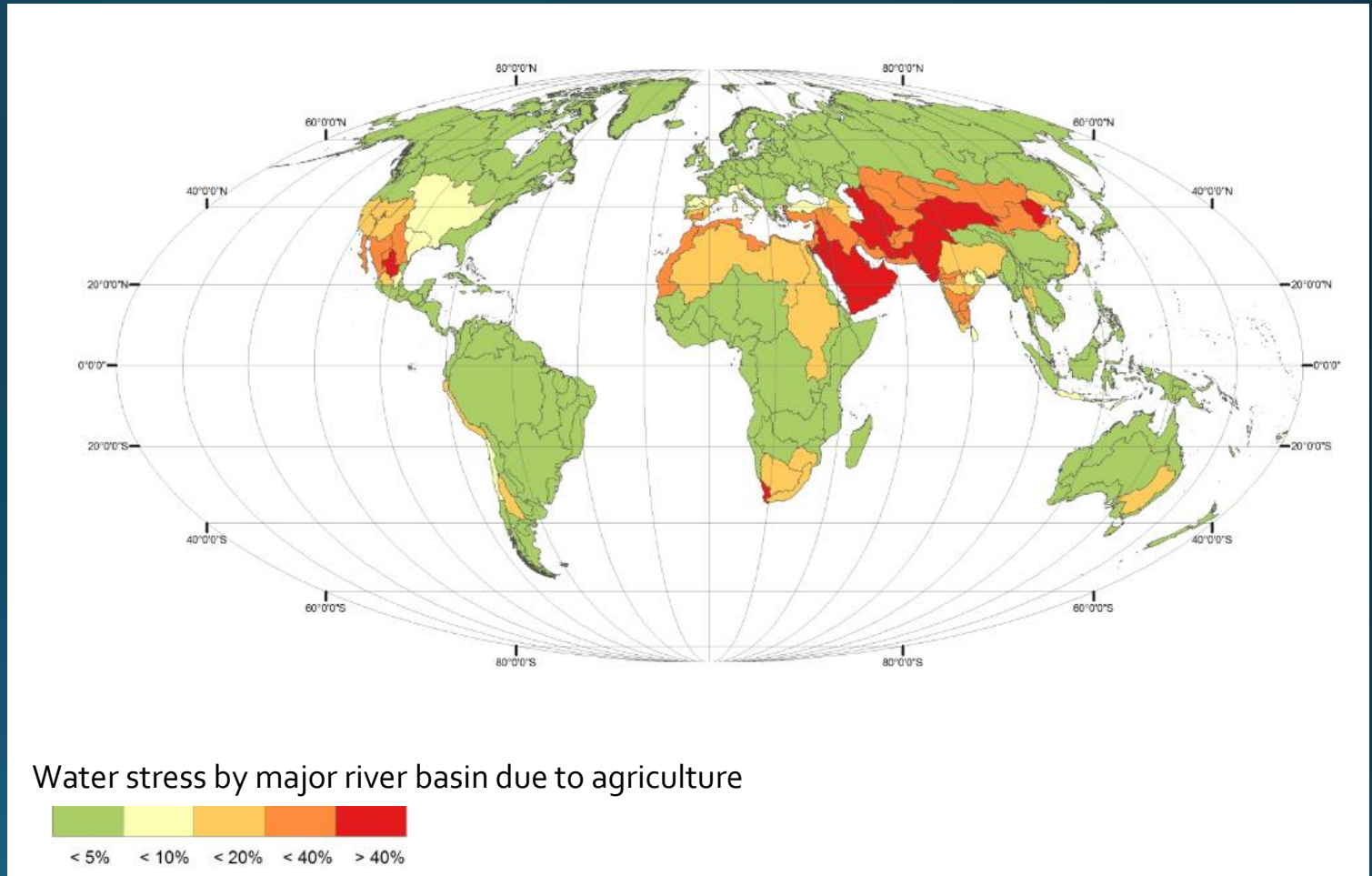
Water withdrawal by major water use sector (%)



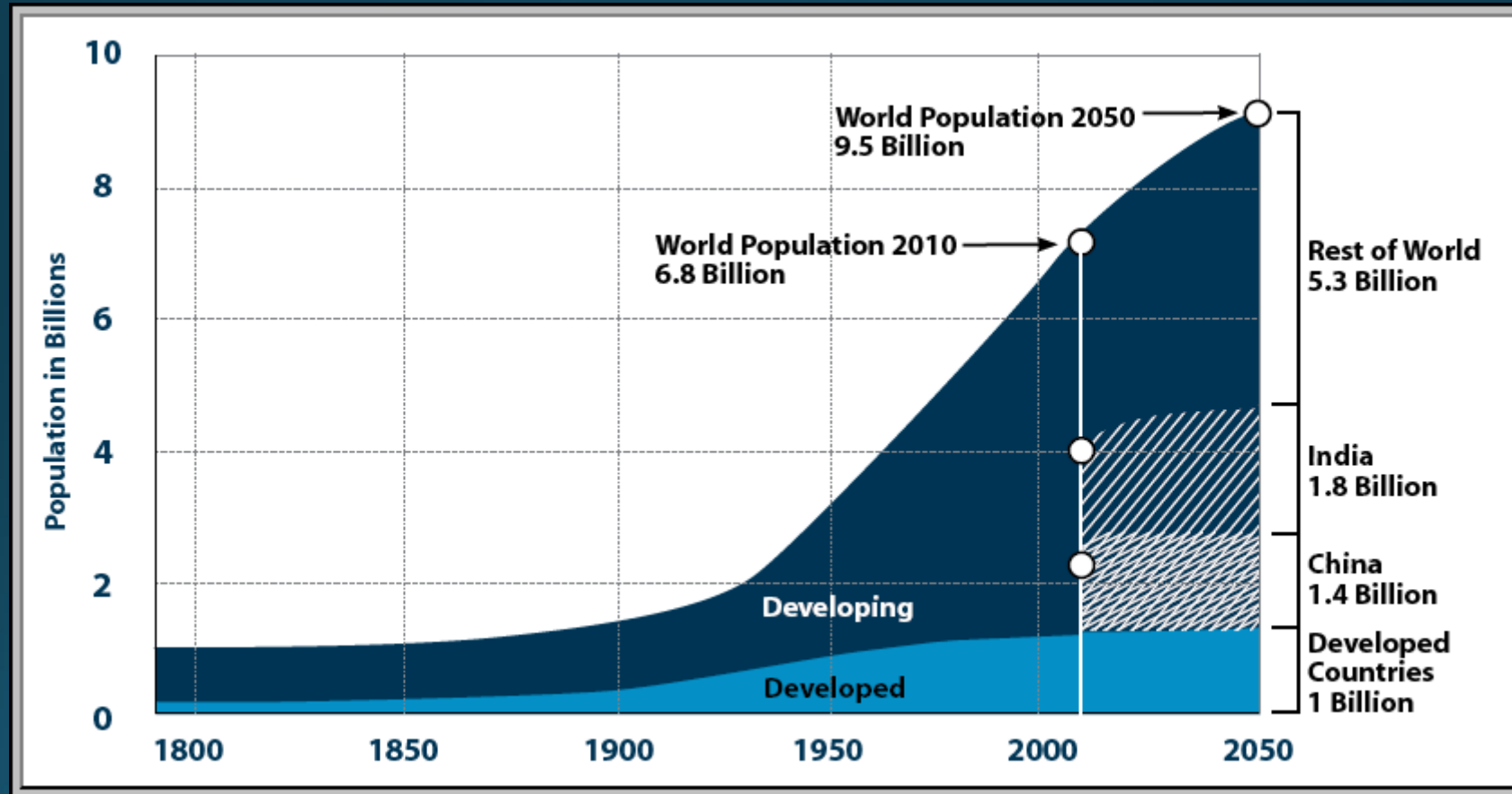
Outlook for Water and Food Security 2050

Sufficient water to satisfy demand for food at **global** level, but an increasing number of **regions** will be affected by water scarcity

In 2050, agriculture will continue to be the **largest user of water** globally and will need to become **increasingly efficient**



Water scarcity: Population growth

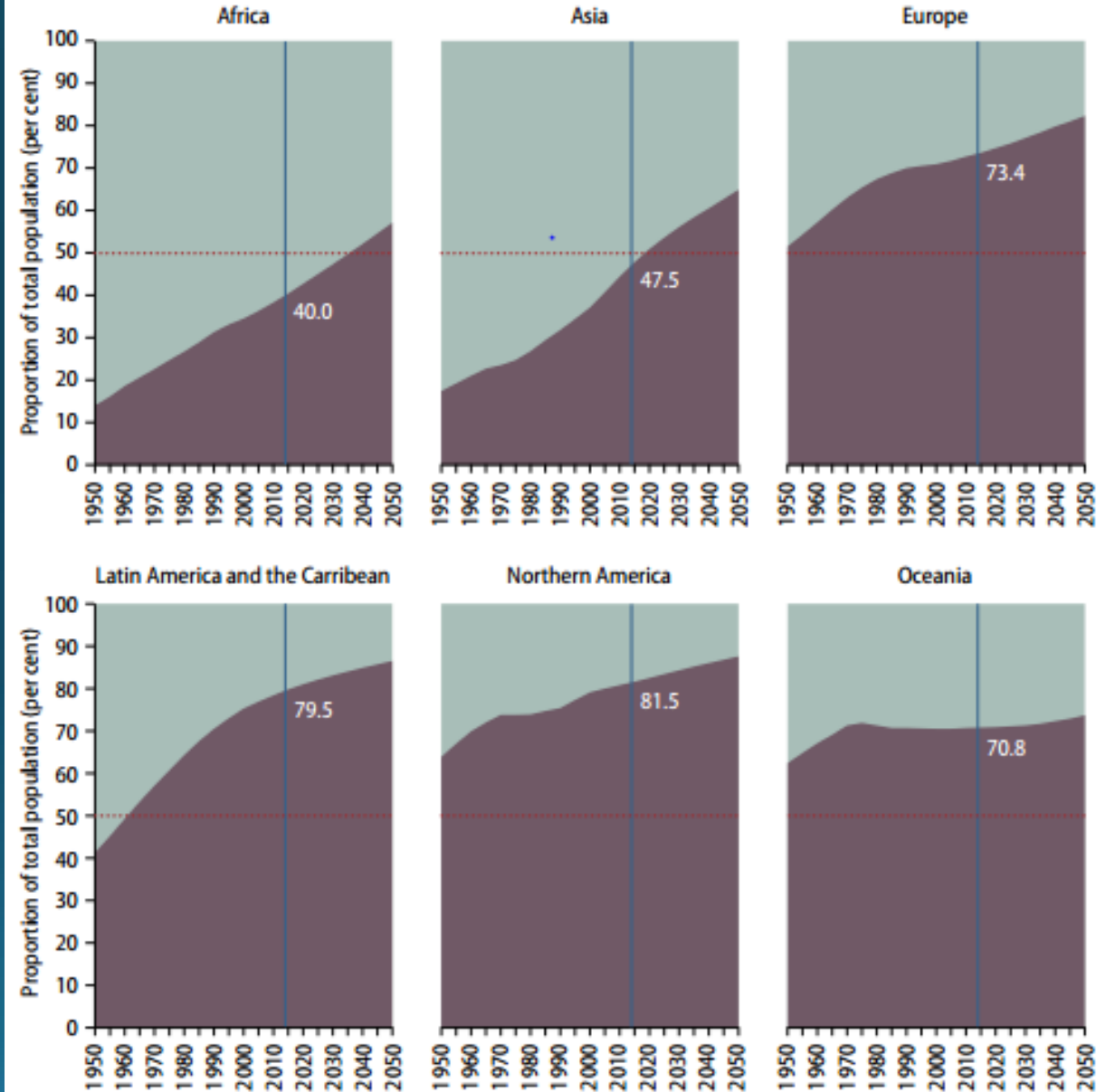


Water scarcity: Urbanization

Urban population

Rural population

Urban and rural population as proportion of total population, by major areas, 1950–2050



Water scarcity: Climate change

Climate changes will increasingly need **investments to enhance adaptation in agriculture**, mostly related to water management

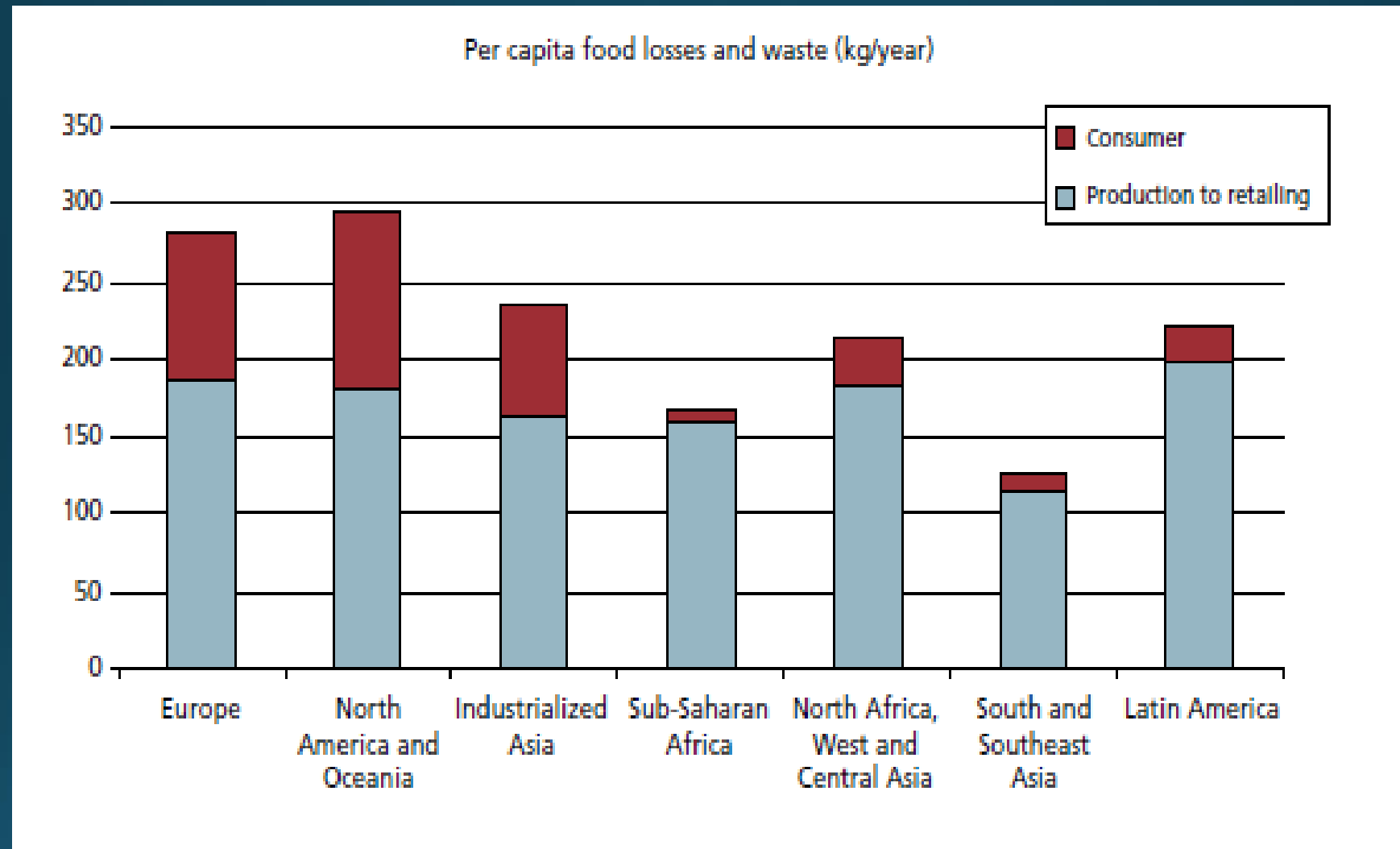


Coping with water scarcity

- Desalinization
- Wastewater use
- Improved water use efficiency in agriculture
 - Reducing food loss and waste
 - Biotechnologies
 - Drought-resistant varieties
 - Micro-organisms
 - Mycorrhizal fungi can improve plant productivity in water-limited conditions
 - Improvement of wastewater for use in agriculture

Food losses and waste

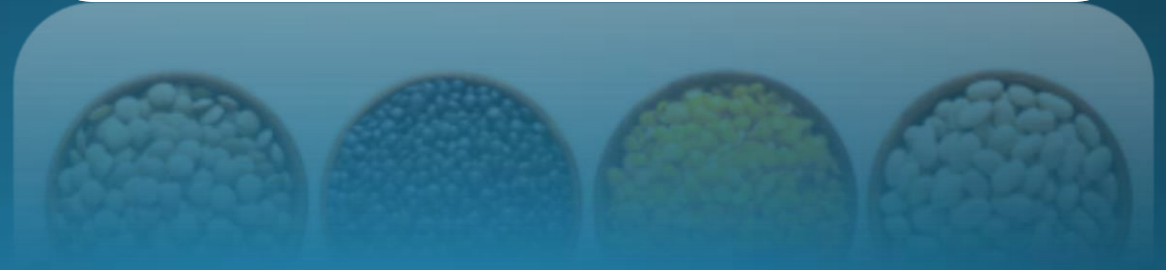
- About 1/3 food produced is lost or wasted
 - 1.3 billion tonnes per year
 - Resources used to produce it are lost
- Much higher waste per capita in industrialized countries
 - 95-115 kg/year in Europe and North America
 - 6-11 kg/year in Sub-Saharan Africa, S SE Asia



Water footprint: crops and animal origin foods

	Litre per kilogram	Litre per kilocalorie	Litre per gram of protein	Litre per gram of fat
Sugar crops	197	0.69	0.0	0.0
Vegetables	322	1.34	26	154
Starchy roots	387	0.47	31	226
Fruits	962	2.09	180	348
Cereals	1644	0.51	21	112
Oil crops	2364	0.81	16	11
Pulses	4055	1.19	19	180
Nuts	9063	3.63	139	47
Milk	1020	1.82	31	33
Eggs	3265	2.29	29	33
Chicken meat	4325	3.00	34	43
Butter	5553	0.72	0.0	6.4
Pig meat	5988	2.15	57	23
Sheep/goat meat	8763	4.25	63	54
Bovine meat	15415	10.19	112	153

Source: [Mekonnen and Hoekstra \(2010\)](#)



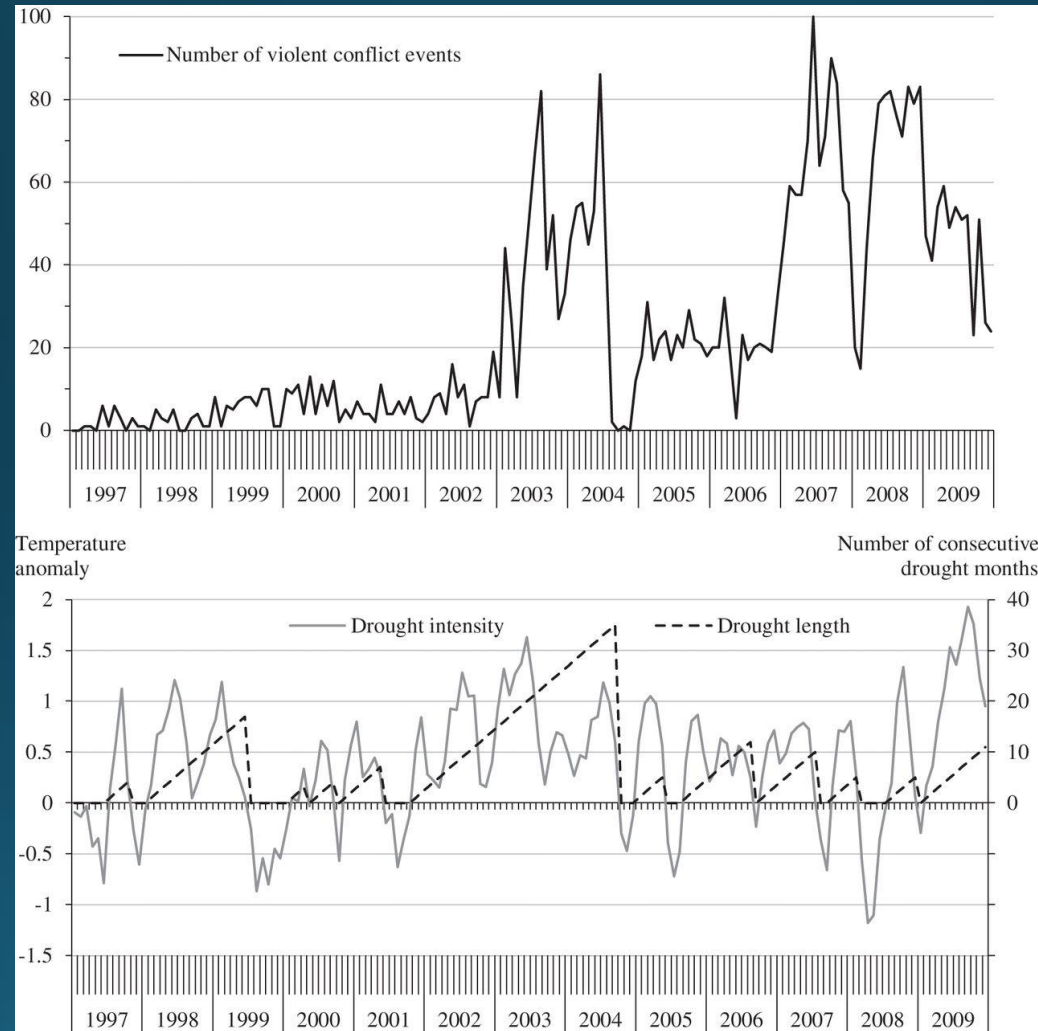
Drought-Water relation to Conflict

Geo-political issues

Evidence

- Temperature extremes and rainfall variability contributed to civil war in East Africa
- Rebel and communal conflict events increase in periods of extreme rainfall variation
- Somalia: strong evidence of drought-conflict relations through livestock price downturns/loss of herder's income/lower resistance to engage in conflict activities

Somalia: Frequency of conflict and drought intensity and length by month.

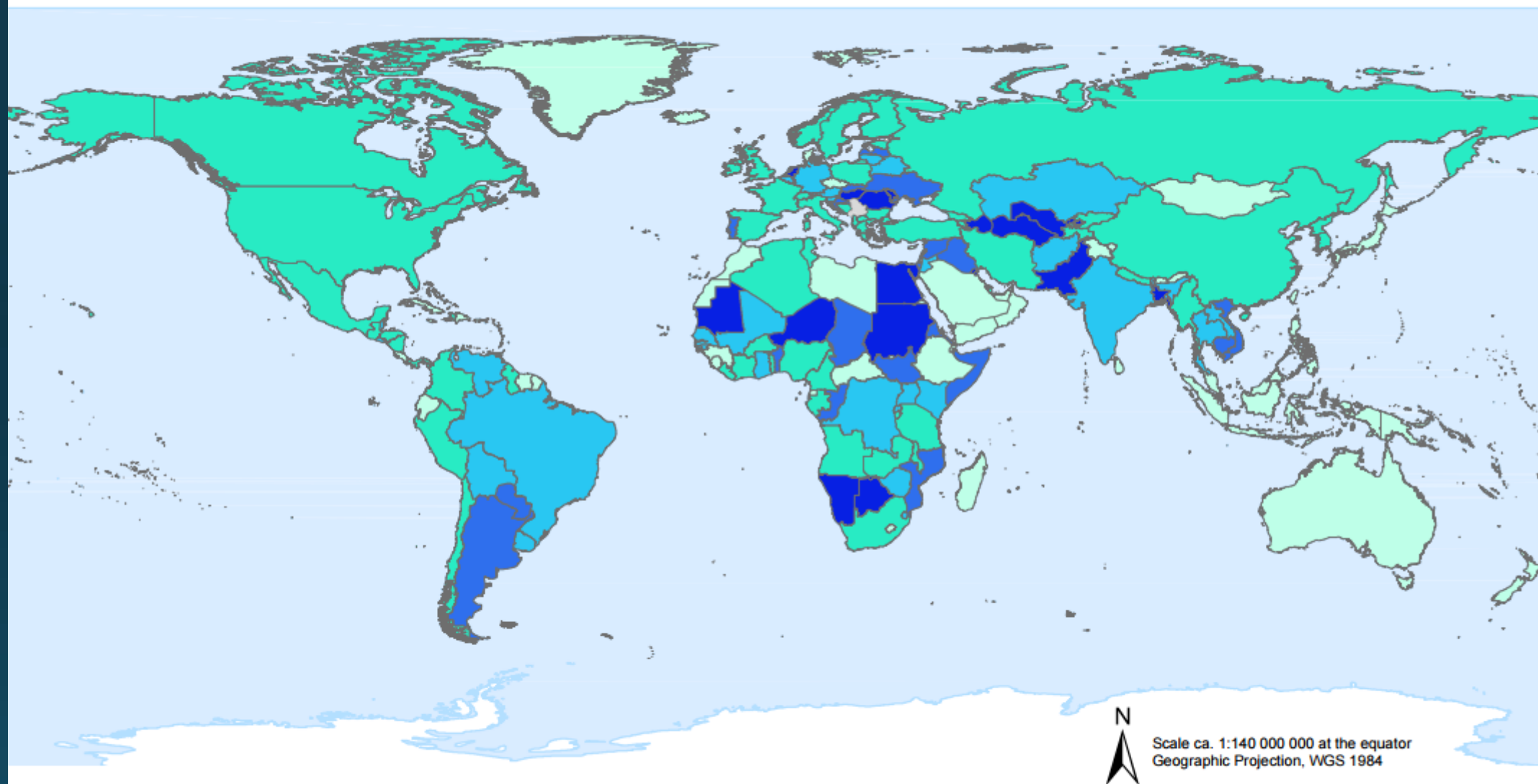


Jean-François Maystadt, and Olivier Ecker *Am. J. Agr. Econ.* 2014;96:1157-1182

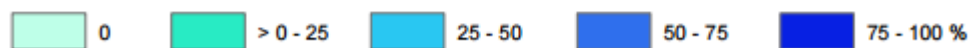


Contribution of transboundary water to the total renewable water resources (%)

The map shows how much a country depends on other countries for its total water resources



Dependency ratio



FAO - AQUASTAT, 2015

Disclaimer

Way Forward: SDG 6

- Targets 6.1 and 6.2: drinking water and basic sanitation
- Targets 6.3 to 6.6: water quality, wastewater management, water scarcity and use efficiency, integrated water resources management, and the protection and restoration of water-related ecosystems
- Targets 6.a and 6.b address the means of implementation and aim for international cooperation, capacity-building and the participation of local communities in water and sanitation management

Thank you

Bluewater consumption increase

	Cubic km
1900	500
1960	2000
2000	4000
2015	

Bluewater: stored runoff of rainfall in lakes, streams rivers, dams and aquifers