

# *Fame e risorse idriche*

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Direttrice

Partnerships and UN Collaboration Division

Roma Tre  
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Food and Agriculture  
Organization of the  
United Nations

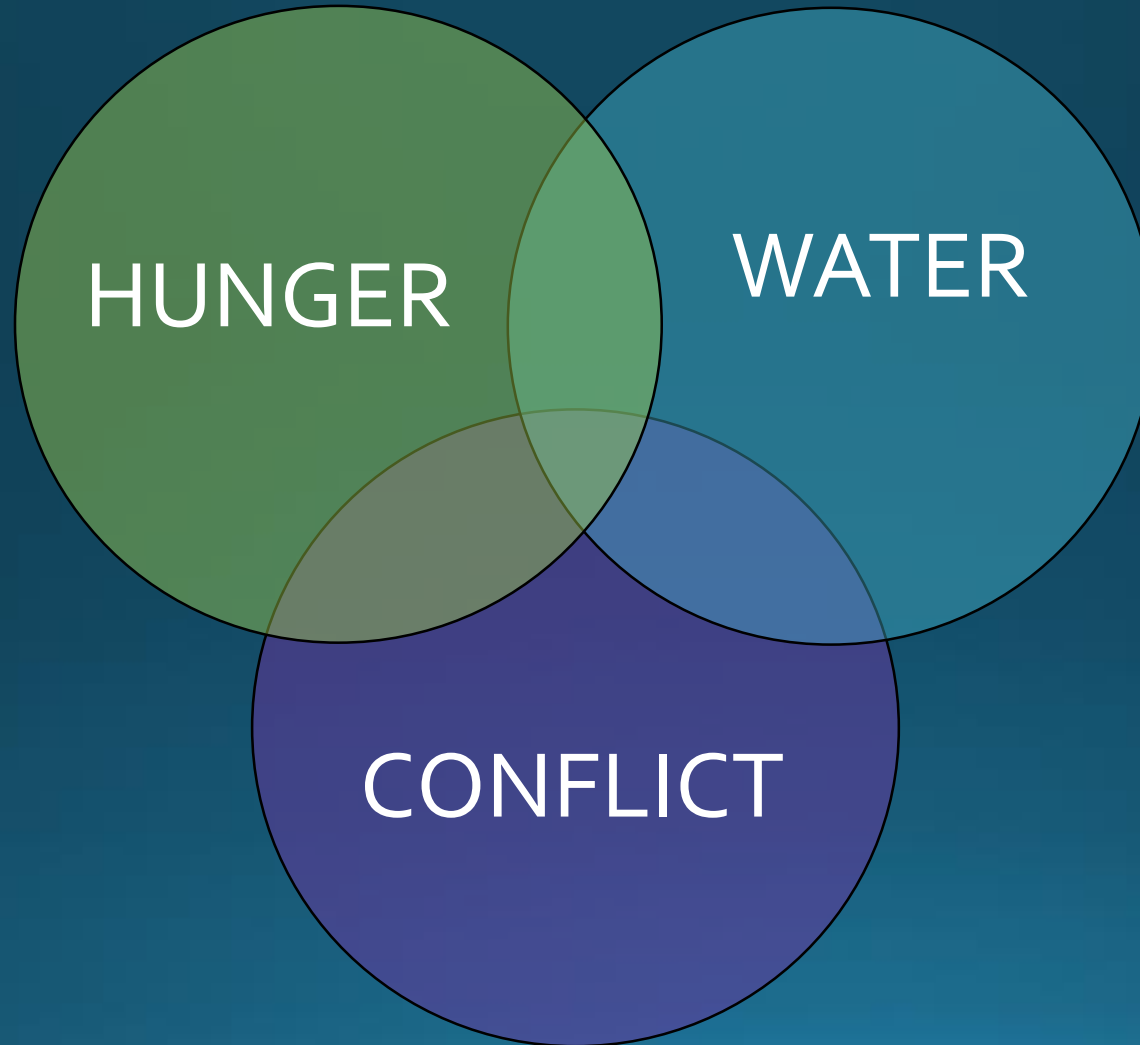


# SUSTAINABLE DEVELOPMENT GOALS

<p><b>1</b> NO POVERTY</p>	<p><b>2</b> ZERO HUNGER</p>	<p><b>3</b> GOOD HEALTH AND WELL BEING</p>	<p><b>4</b> QUALITY EDUCATION</p>	<p><b>5</b> GENDER EQUALITY</p>	<p><b>6</b> CLEAN WATER AND SANITATION</p>
<p><b>7</b> AFFORDABLE AND CLEAN ENERGY</p>	<p><b>8</b> DECENT WORK AND ECONOMIC GROWTH</p>	<p><b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>	<p><b>10</b> REDUCED INEQUALITIES</p>	<p><b>11</b> SUSTAINABLE CITIES AND COMMUNITIES</p>	<p><b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION</p>
<p><b>13</b> CLIMATE ACTION</p>	<p><b>14</b> LIFE BELOW WATER</p>	<p><b>15</b> LIFE ON LAND</p>	<p><b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS</p>	<p><b>17</b> PARTNERSHIPS FOR THE GOALS</p>	<p>SUSTAINABLE DEVELOPMENT GOALS</p>



# Complex Relationships





TARGET 2-1



UNIVERSAL ACCESS TO SAFE AND NUTRITIOUS FOOD

TARGET 2-2



END ALL FORMS OF MALNUTRITION

TARGET 2-3



DOUBLE THE PRODUCTIVITY AND INCOMES OF SMALL-SCALE FOOD PRODUCERS

TARGET 2-4



SUSTAINABLE FOOD PRODUCTION AND RESILIENT AGRICULTURAL PRACTICES

TARGET 2-5



MAINTAIN THE GENETIC DIVERSITY IN FOOD PRODUCTION

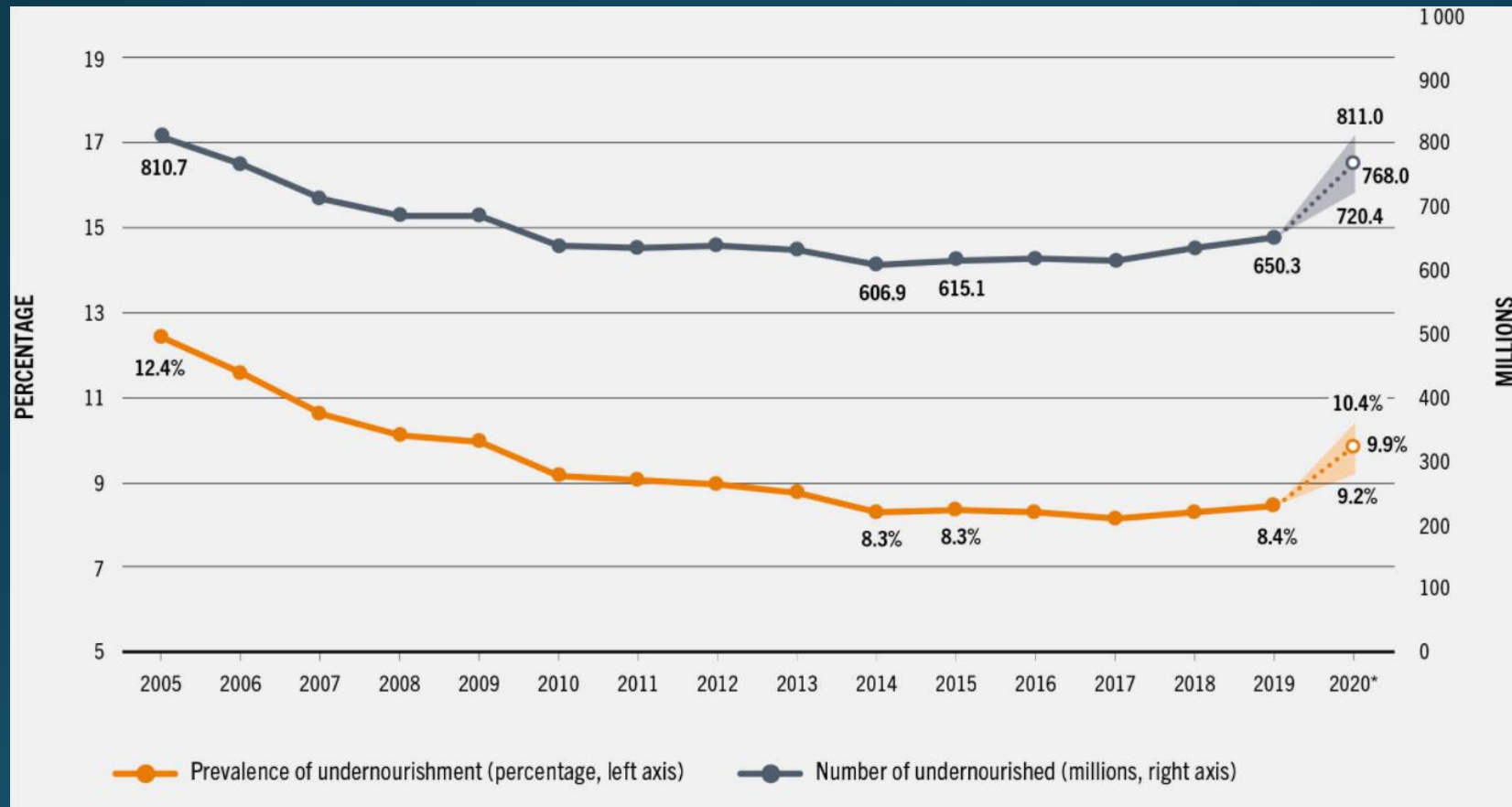


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# World Food System: Flawed

- **Hunger and malnourishment** -definitions
  - 768 m undernourished
  - 161 m acute food insecurity
  - 1.8 bn adults overweight
    - +672 m obese
  - 2 bn persons micronutrient deficient
- Food production: Enough food produced in the world for all
- Food loss and waste
  - About 1/3 of all food produced

# Prevalence of Undernourishment (PoU) and Number of Undernourished



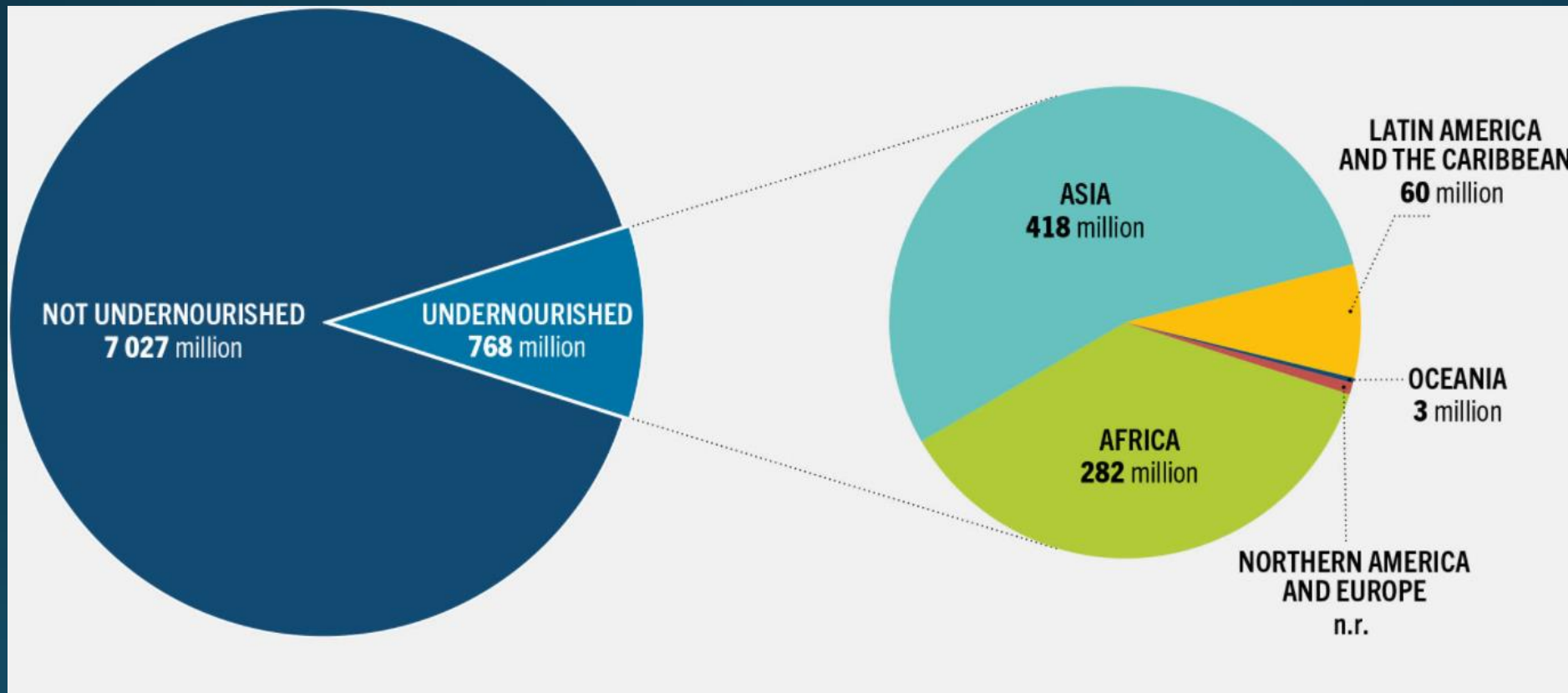
Source: SOFI 2021

# Causes of the increase of hunger

- Conflict
- Climate change
- Economic downturn (COVID19)

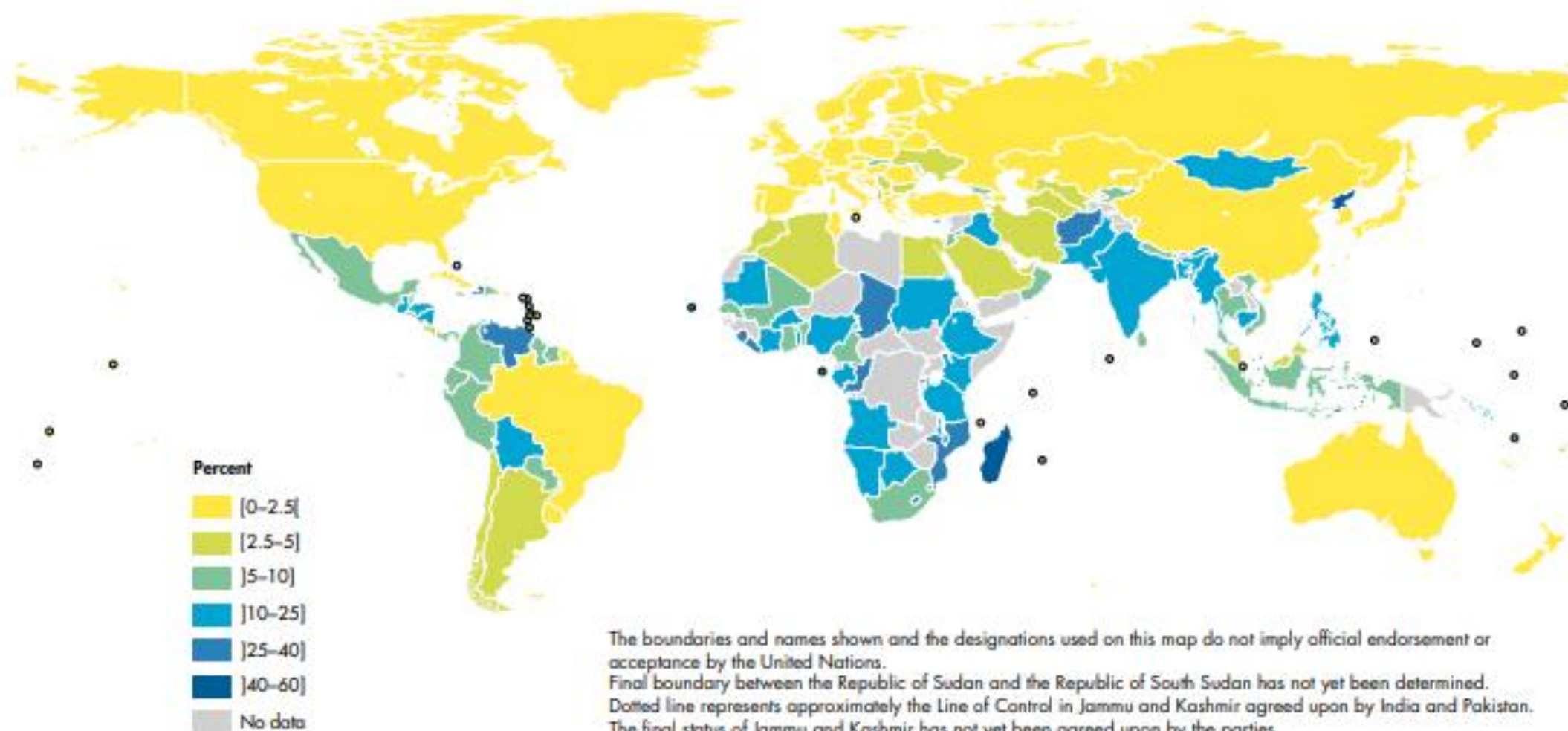


# Hunger: more than half in Asia, more than one third in Africa



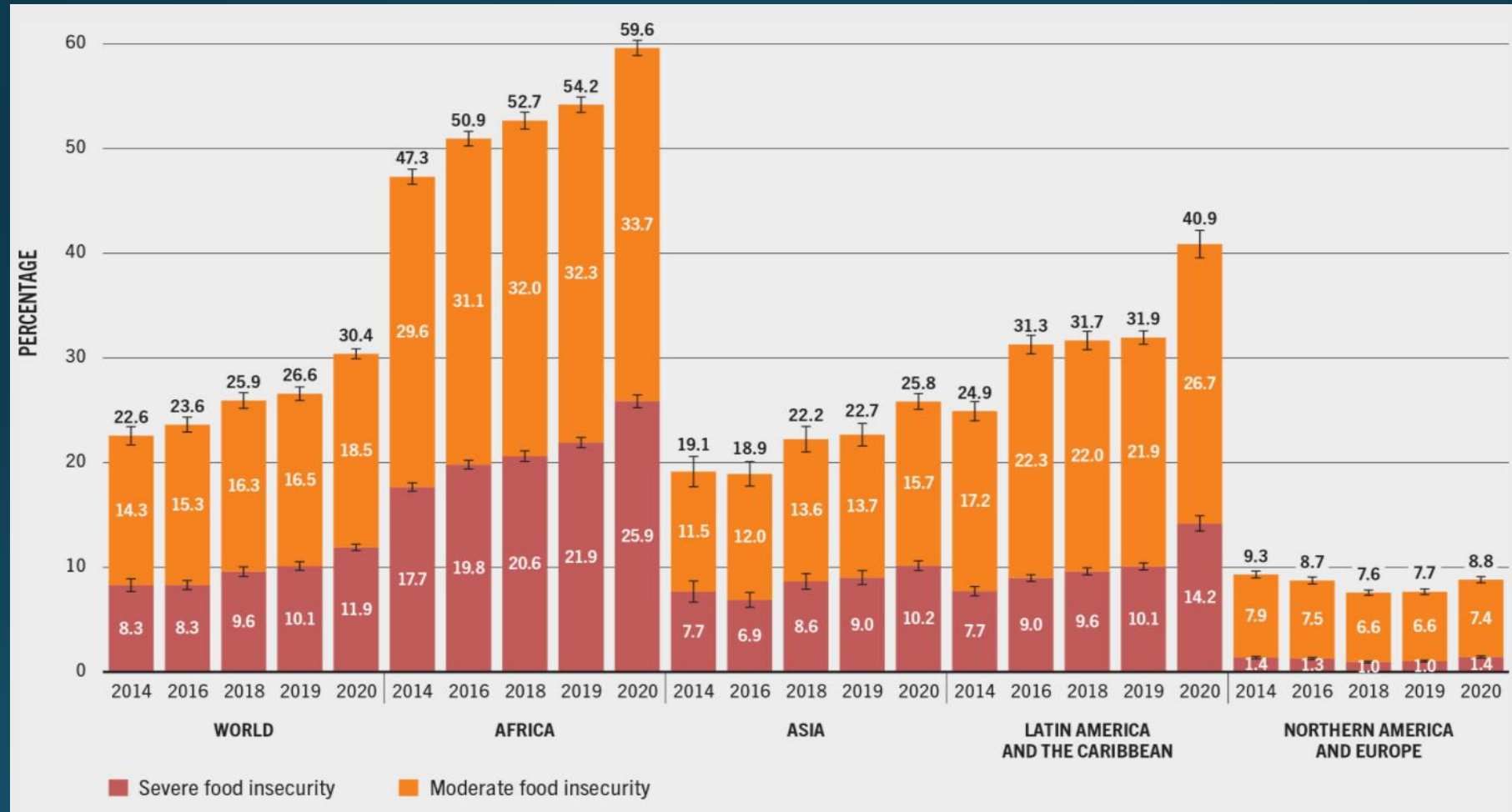
Source: SOFI 2021

## PREVALENCE OF UNDERNOURISHMENT (2017–2019 AVERAGE)



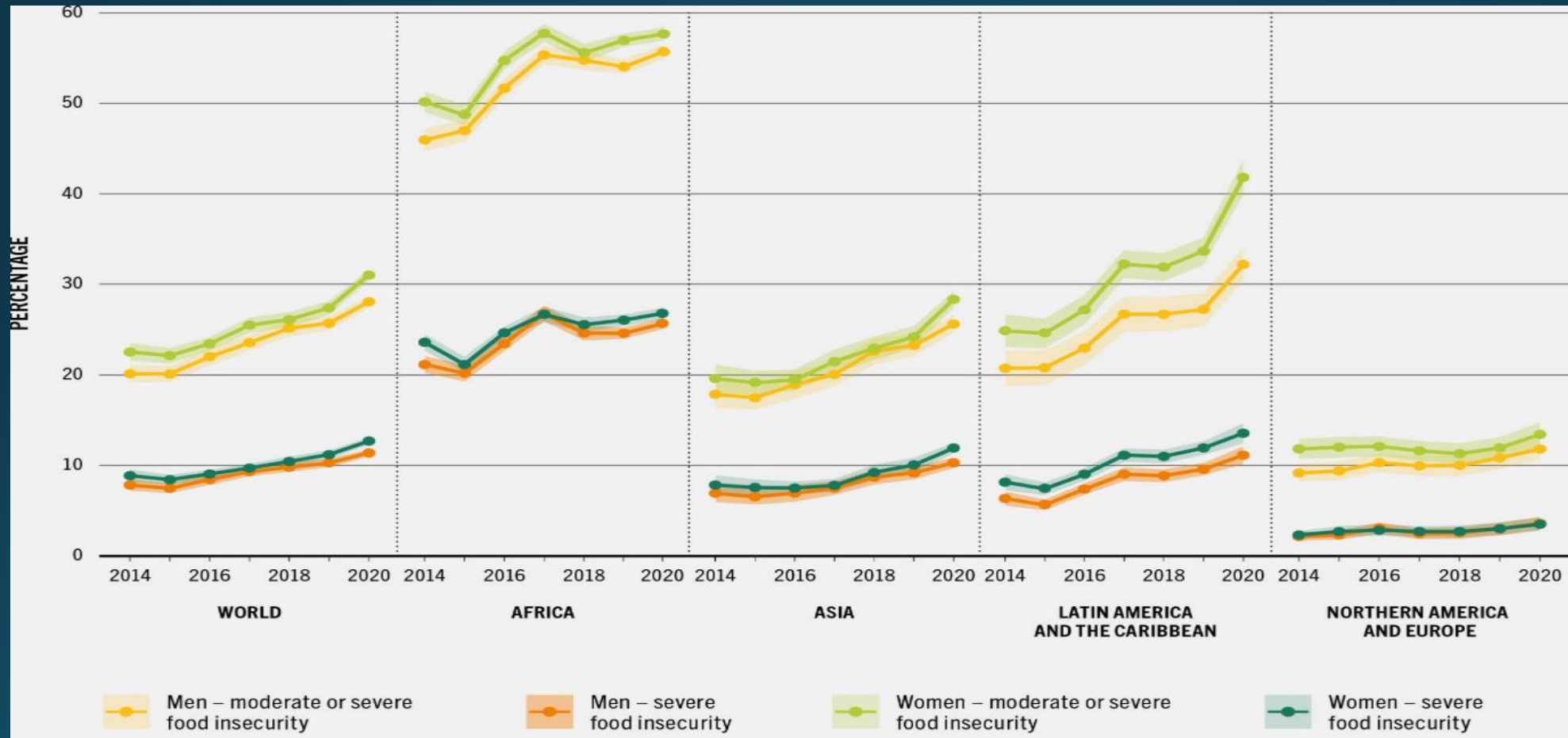
# SDG2: more than hunger

## Safe, nutritious and sufficient food all year round

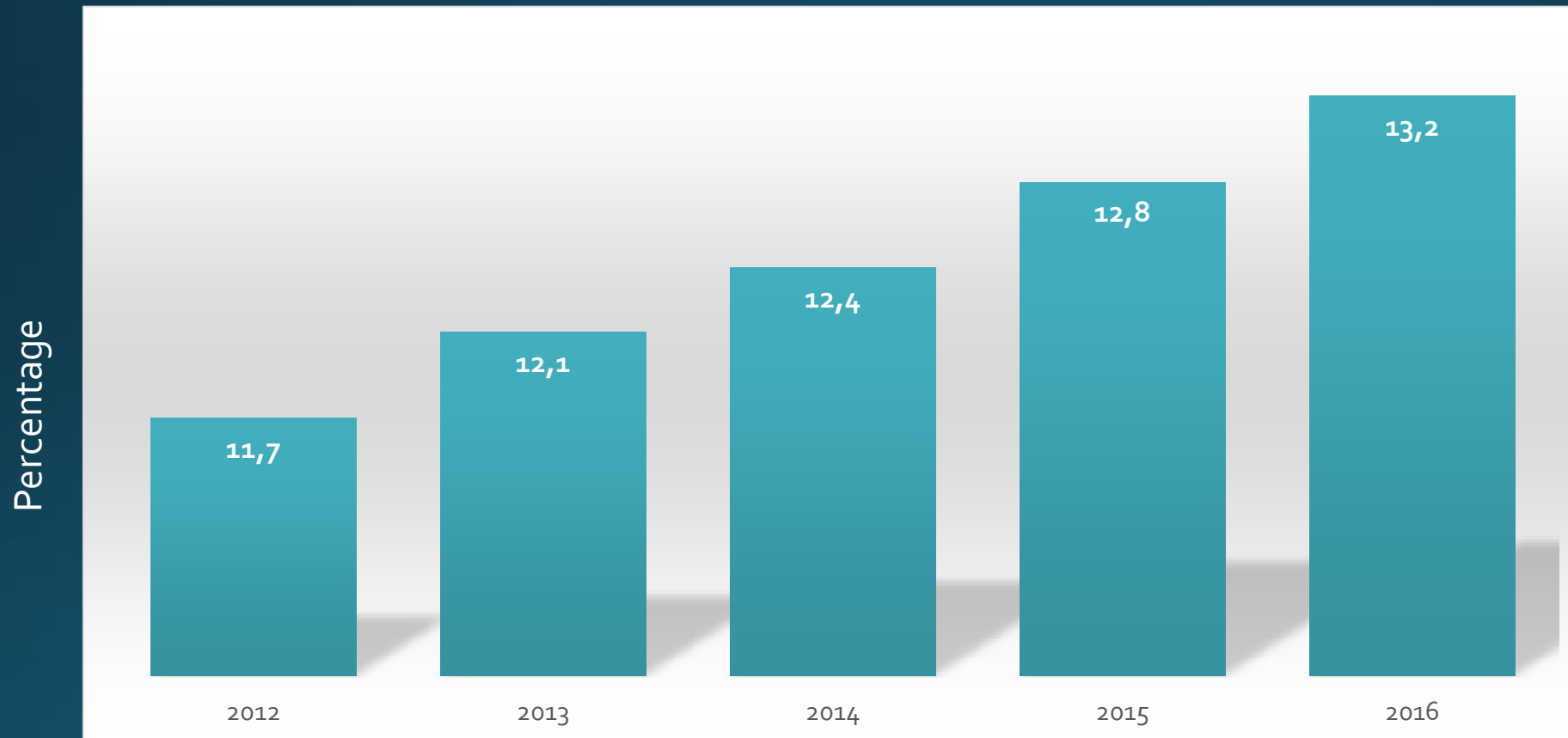


Source: SOFI 2021 FIES data

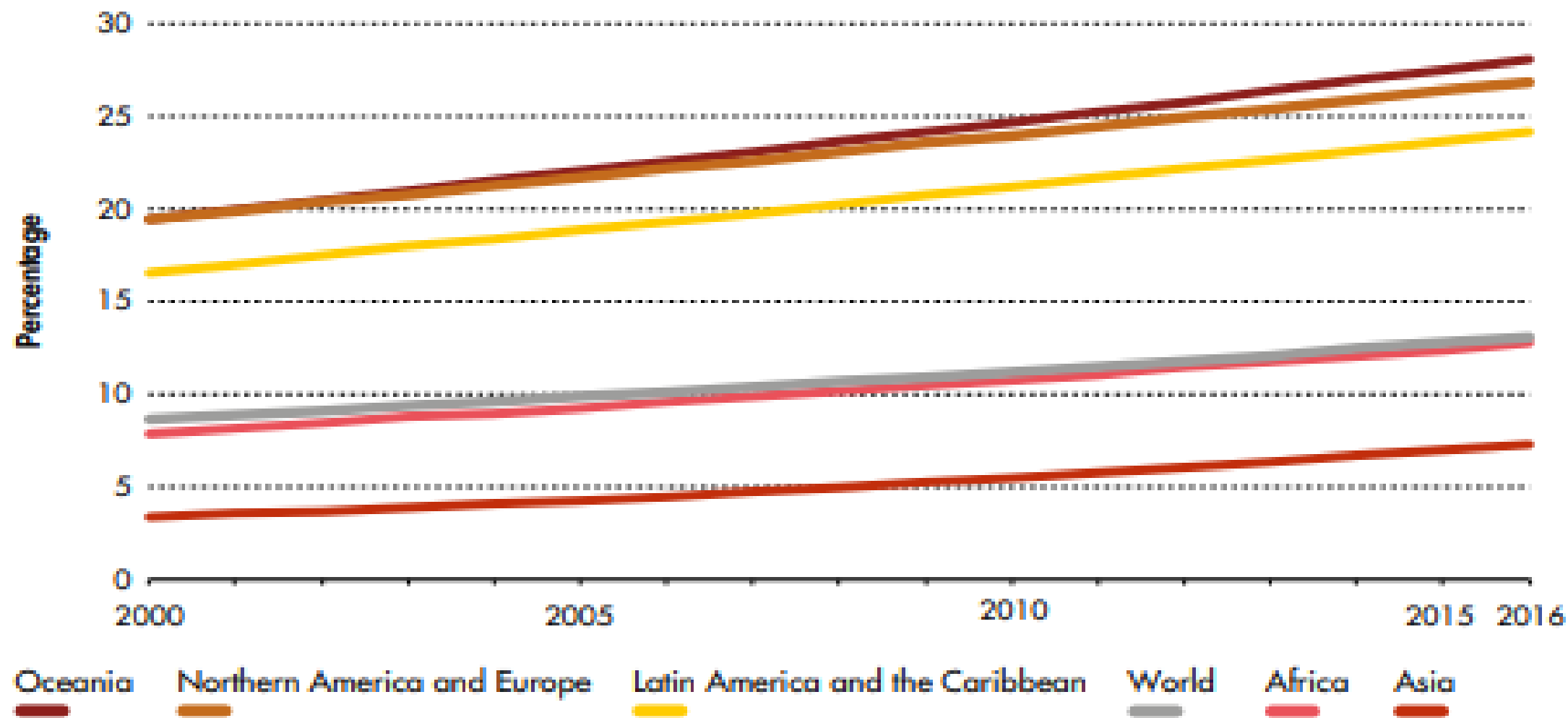
# GLOBALLY AND IN EVERY REGION, FOOD INSECURITY IS HIGHER AMONG WOMEN THAN MEN



# Proportion of obese adults in the world

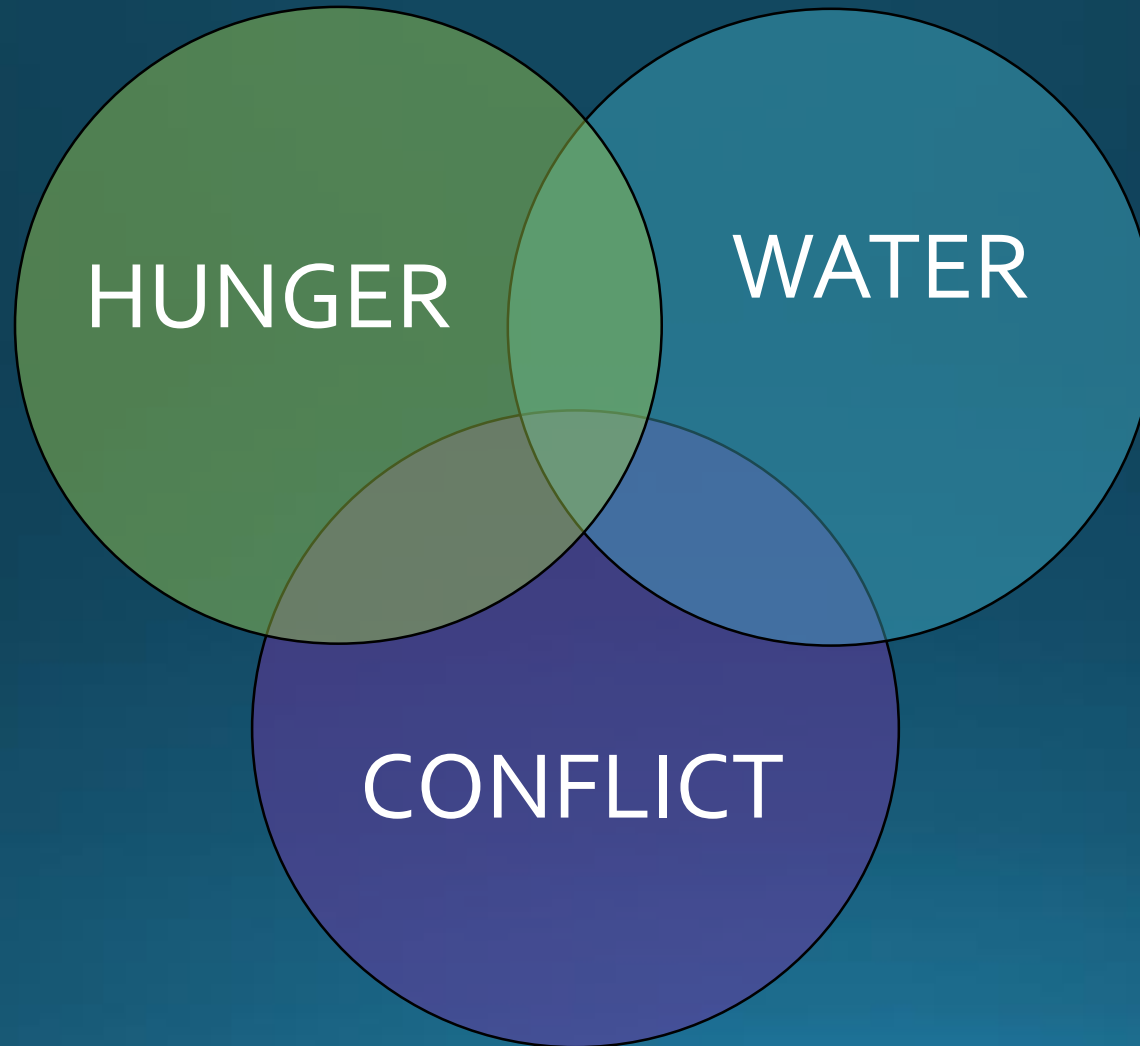


## PREVALENCE OF OBESITY IN THE ADULT POPULATION BY REGION



Source: FAOSTAT

# Complex Relationships



**6** CLEAN WATER  
AND SANITATION





# SDG 6: ensure availability and sustainable management of water and sanitation for all

- 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



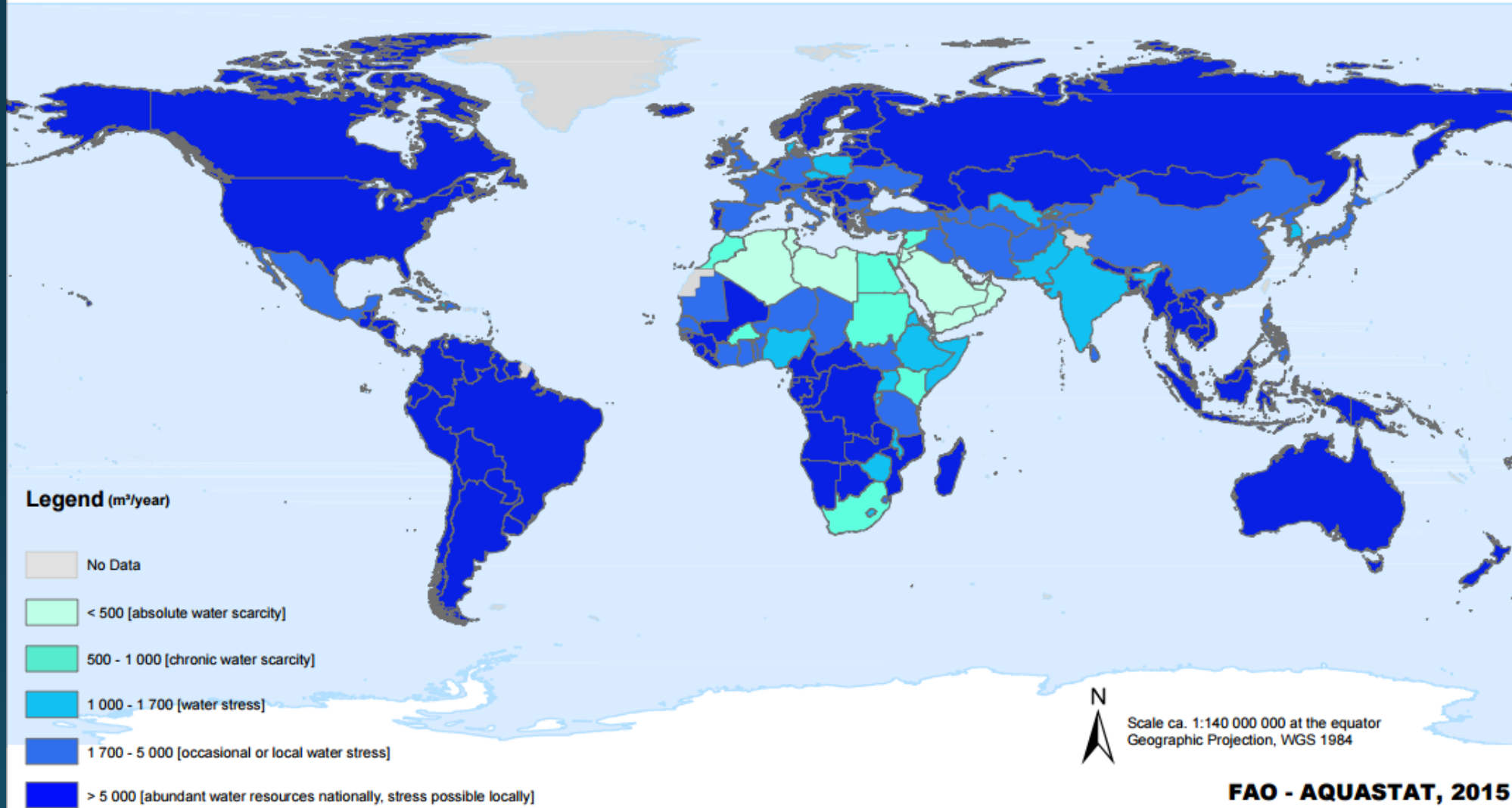
**2.3 BILLION PEOPLE**  
— LIVE IN —  
**WATER-STRESSED**  
**COUNTRIES** (2018)

# Status in 2020

- Billions of people lack access to safe drinking water, sanitation and hygiene
  - 2 billion people lack safely managed drinking water (26%)
  - 3.6 billion people lack safely managed sanitation (46%)
  - 2.3 billion people lack basic hygiene (29%)
- From 1970 to 2015 natural wetlands shrank by 35%
  - 3 times the rate of forest loss
- 129 countries not on track to have sustainably managed water resources by 2030
  - Current rate of progress needs to DOUBLE

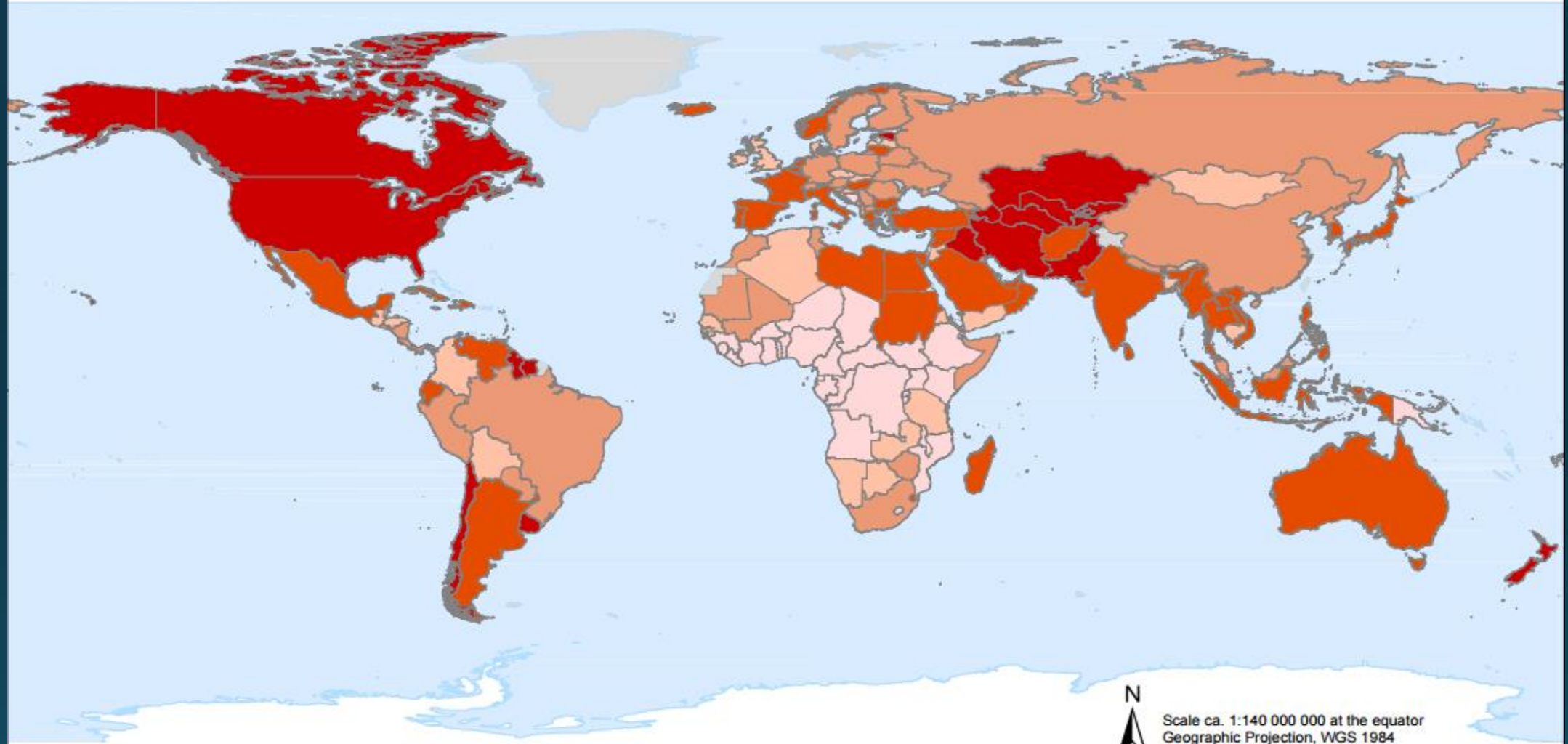


## Total renewable water resources per inhabitant in 2014 (m<sup>3</sup>/year)





## Water withdrawal per inhabitant (m<sup>3</sup>/year)



### Legend



**FAO - AQUASTAT, 2015**

Disclaimer

# Water Scarcity

# 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

# Water Scarcity

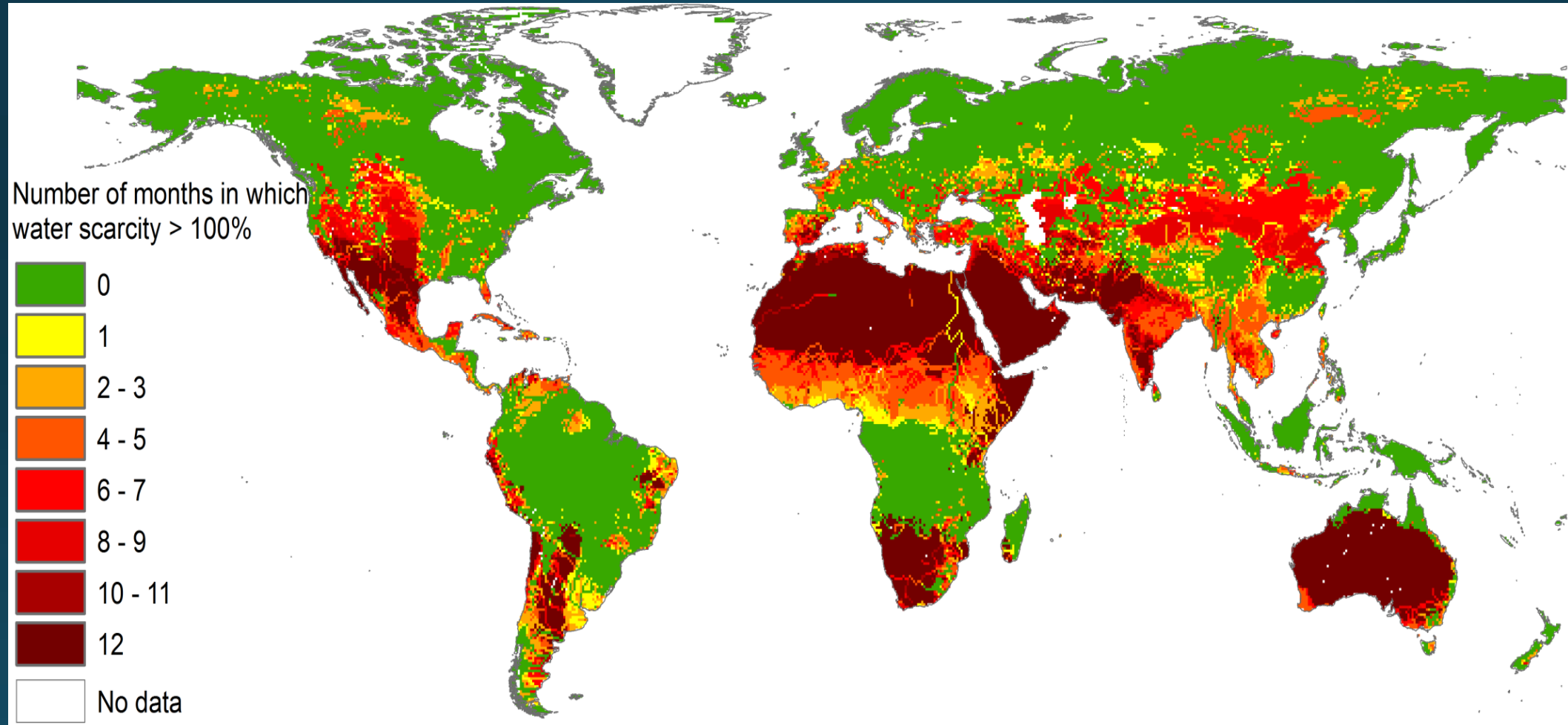
- **Water use** grew twice as fast as population in last century
- Demographic growth and economic development: unprecedented pressure on renewable but limited water resources
- 2025: 2 bn people living in areas of absolute water scarcity (<500 m<sub>3</sub>/p/y)
- Climate change and bio-energy demands will exacerbate problem
- Agriculture may also exacerbate the problem



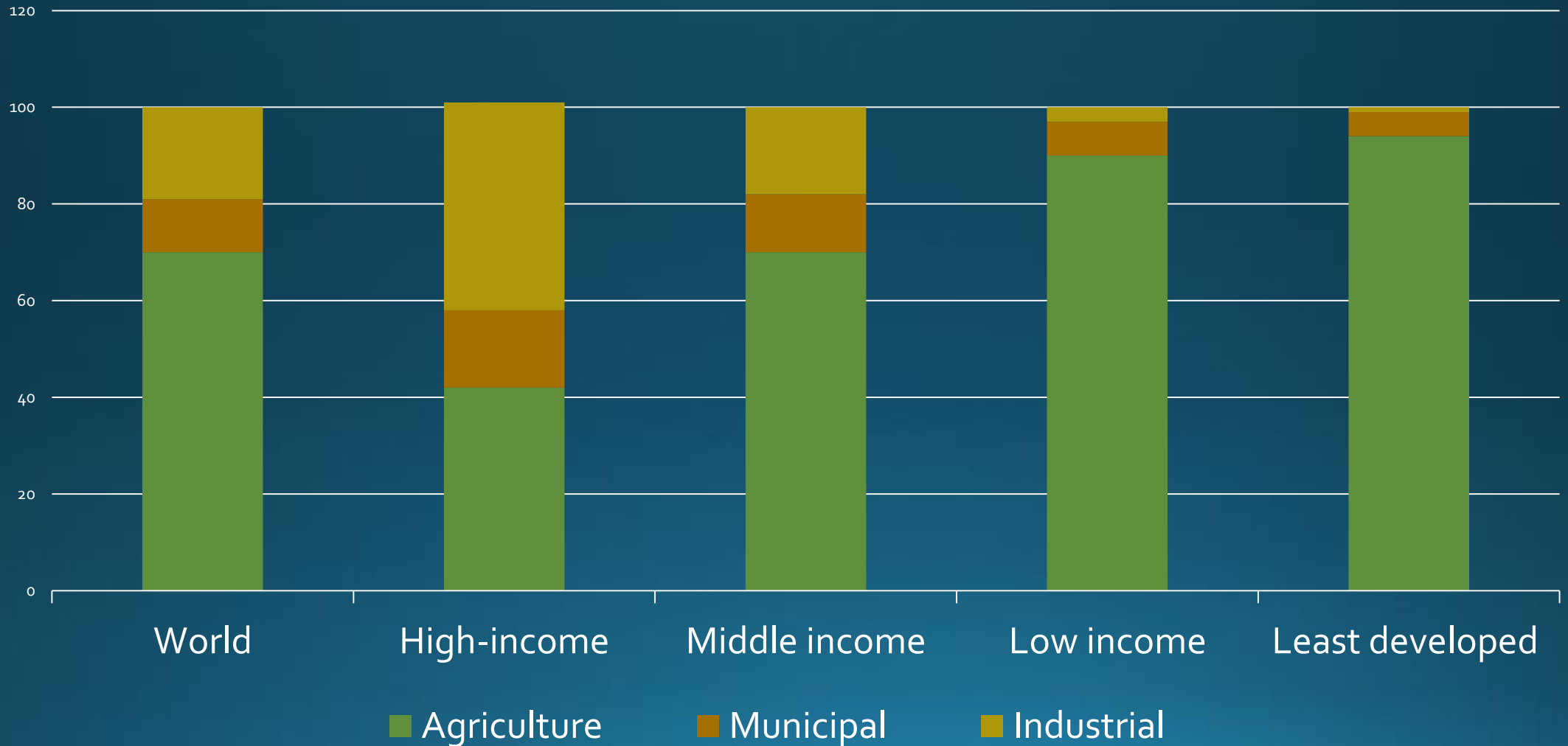
# Water Scarcity

- Relative concept
- Scarcity in availability (quality, quantity in relation to demand)
- Scarcity in access to water services (institutions)
- Scarcity due to lack of infrastructure
- Socio-political issues

# Blue water scarcity above 100%: months



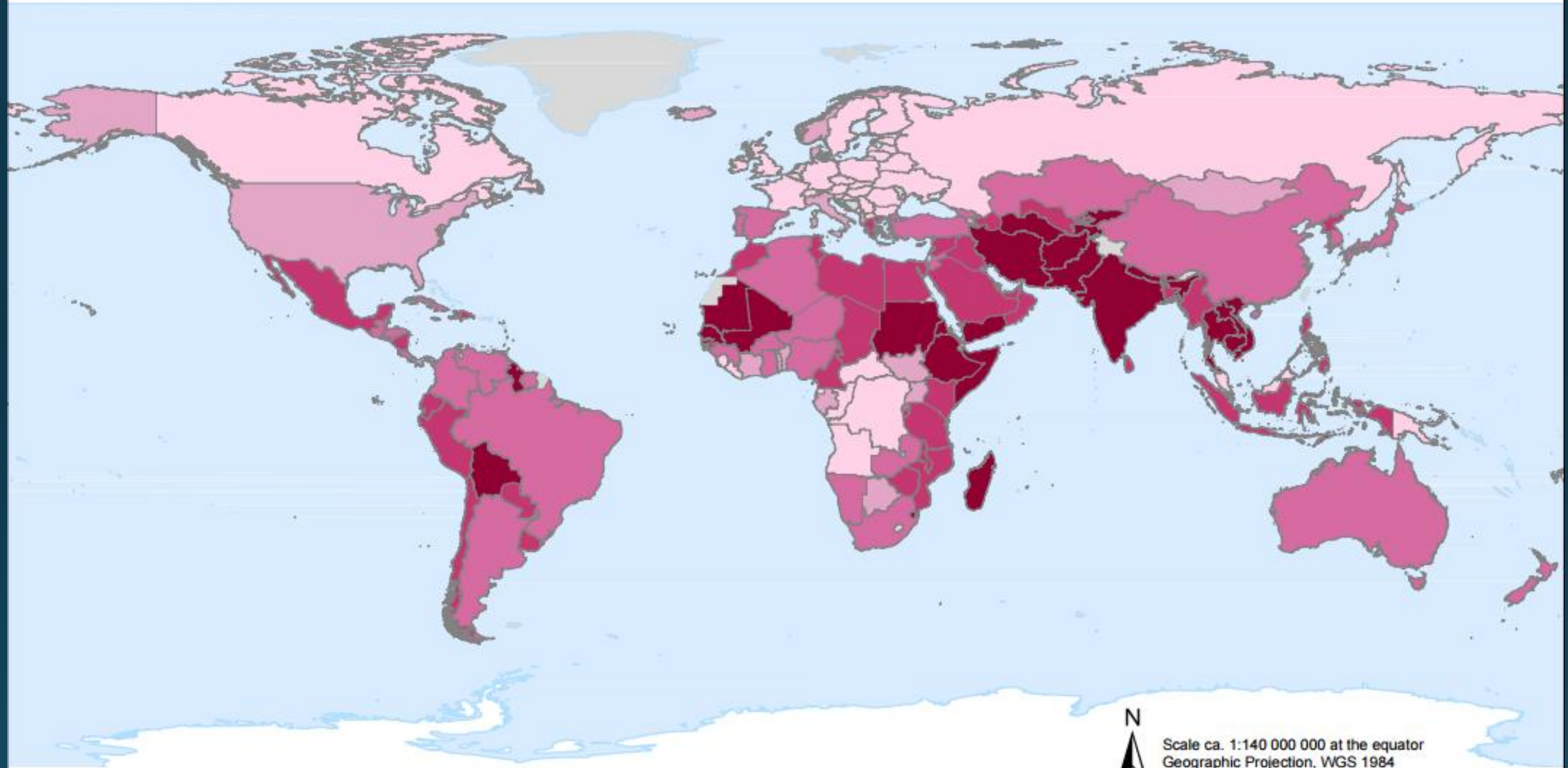
# Water withdrawal by major water use sector (%)





# Proportion of total water withdrawal withdrawn for agriculture

Agricultural water withdrawal as percentage of total water withdrawal for agricultural, municipal and industrial purposes



Scale ca. 1:140 000 000 at the equator  
Geographic Projection, WGS 1984

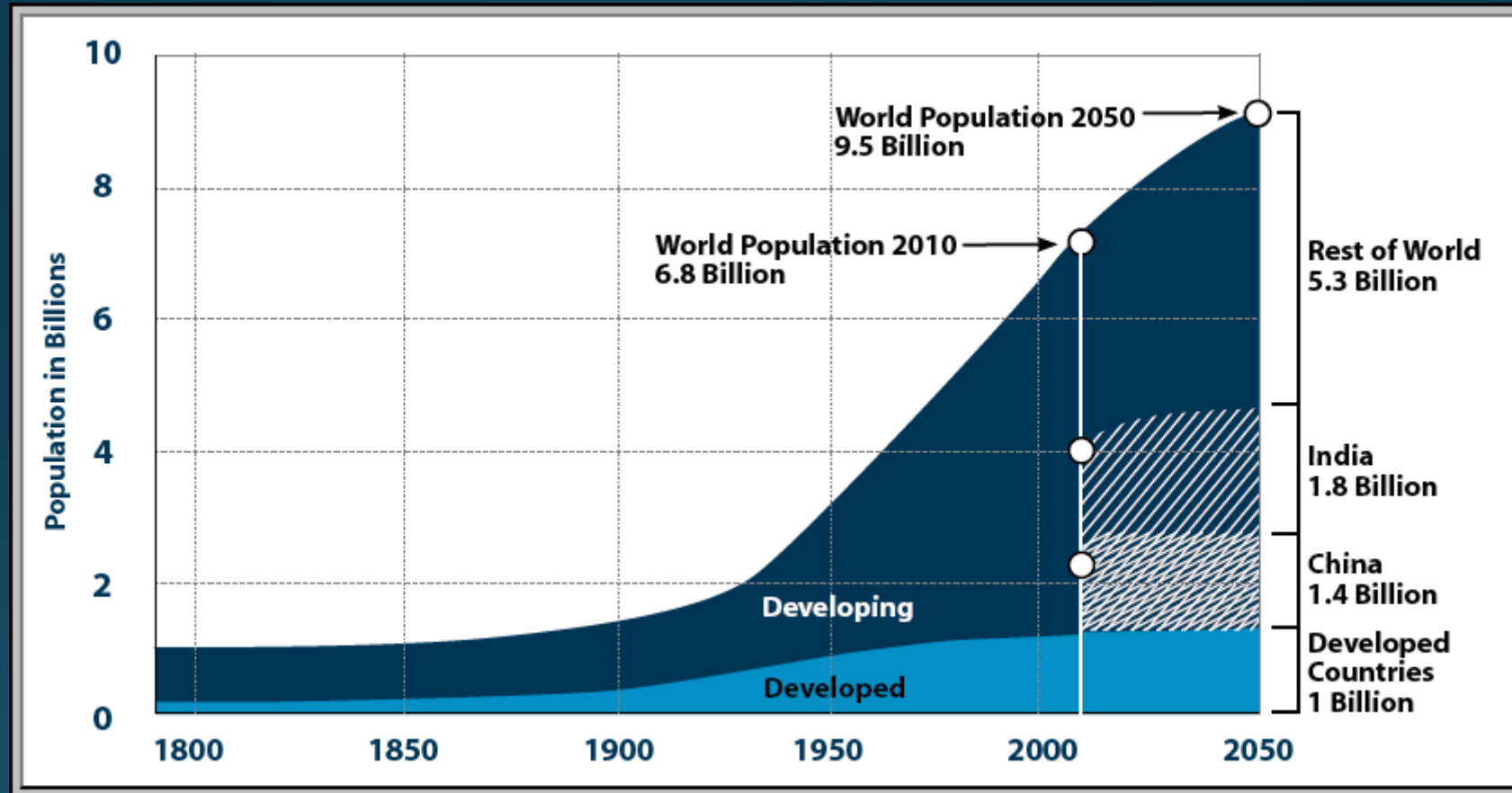
## Legend



**FAO - AQUASTAT, 2015**

Disclaimer

# Water scarcity drivers: Population growth



# Water scarcity: Urbanization

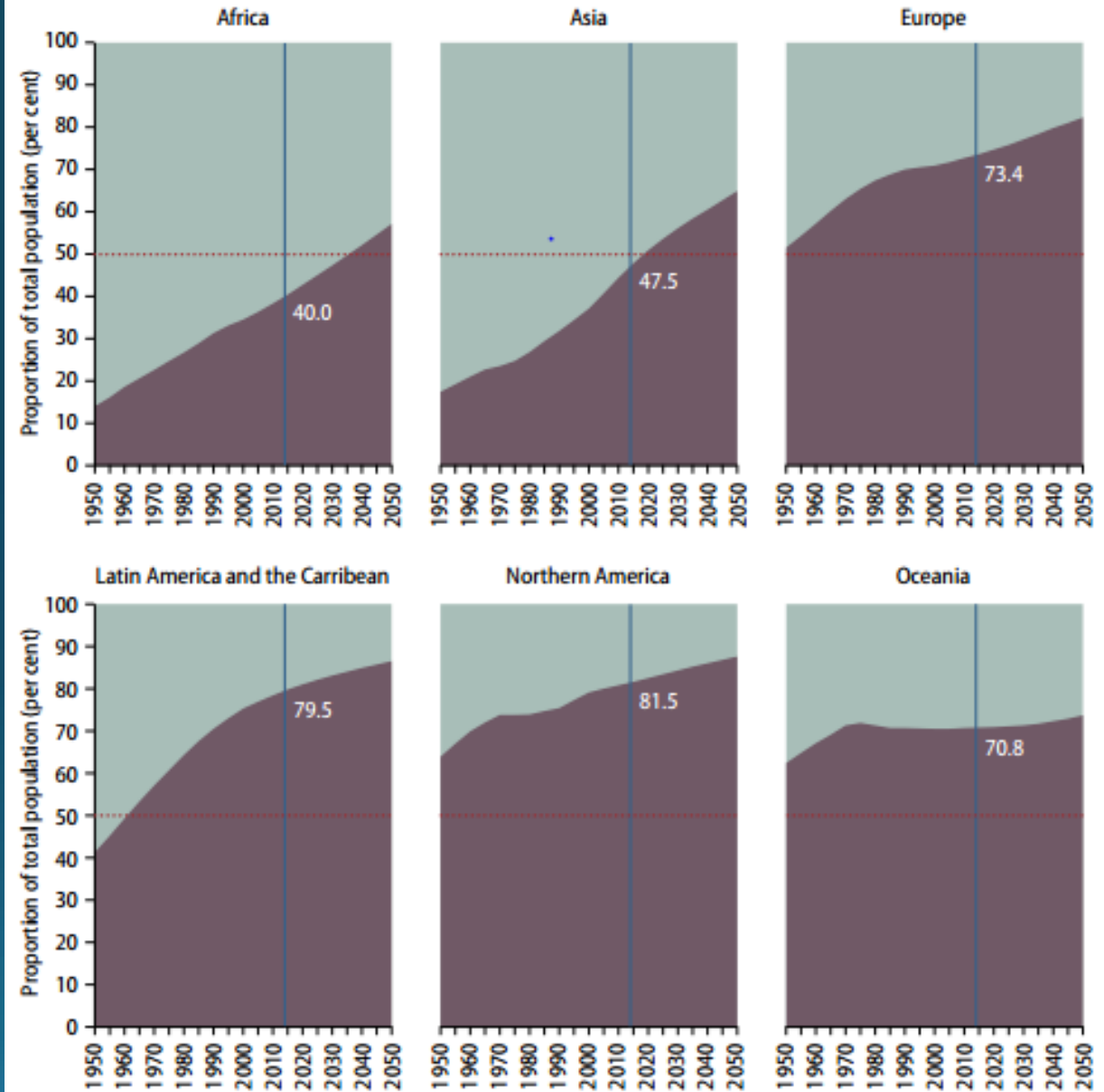
Urban population



Rural population



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



# Water scarcity: Climate change



13 CLIMATE ACTION



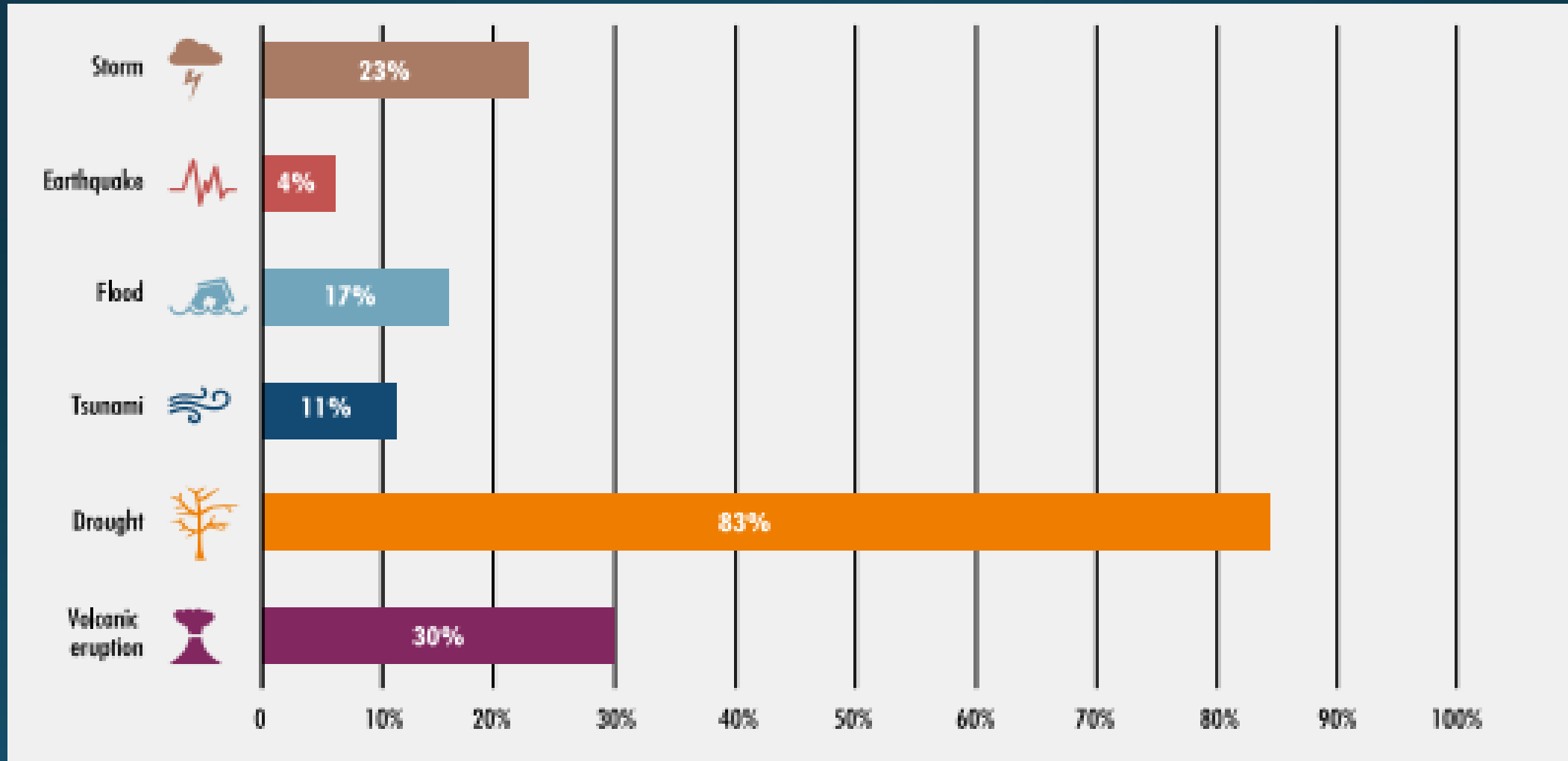
# Droughts

- Droughts have affected more people than any other natural hazard
- 12 m ha land lost to drought and desertification each year






# Climate-change related damage and loss in agriculture by type of hazard



# Coping with water scarcity

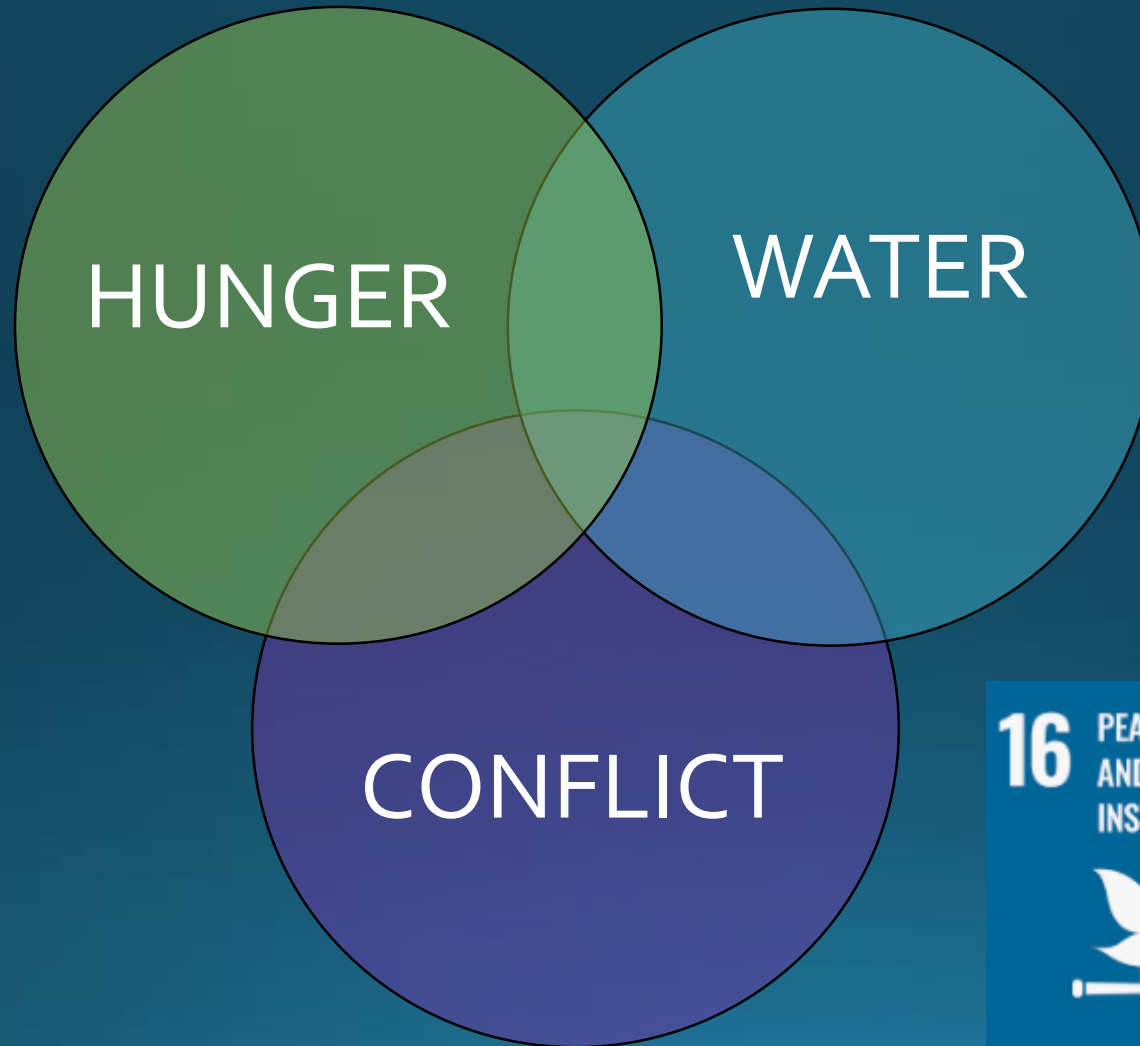
- Desalinization
- Wastewater use
- Improved water use efficiency in agriculture
  - Reducing food loss and waste SDG 12.3 
  - Biotechnologies
    - Drought-resistant varieties
    - Micro-organisms
      - Mycorrhizal fungi can improve plant productivity in water-limited conditions
      - Improvement of wastewater for use in agriculture

## 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 \(2010\)](#)

# Complex Relationships





# Peace and Food Security

# 2030 agenda cannot be achieved without peace

- Peace is both a precondition for development as well as a development outcome in its own right: *"...there can be no sustainable development without peace and no peace without sustainable development."*
- Likewise, there can be no peace without food security and no food security without peace
  - FAO constitution
- 1.5 billion people live in conflict-affected, post-conflict, fragile countries

Conflict causes food insecurity



# 2021

# GLOBAL REPORT ON FOOD CRISES

JOINT ANALYSIS FOR BETTER DECISIONS

SEPTEMBER 2021 UPDATE



Food and Agriculture Organization of the United Nations





Phase
Phase 1 <b>None/Minimal</b>
Phase 2 <b>Stressed</b>
Phase 3 <b>Crisis</b>
Phase 4 <b>Emergency</b>
Phase 5 <b>Catastrophe/Famine</b>

September 2021: 161 m in IPC phase 3 or above ACUTE

584000 in Catastrophe (Phase 5)

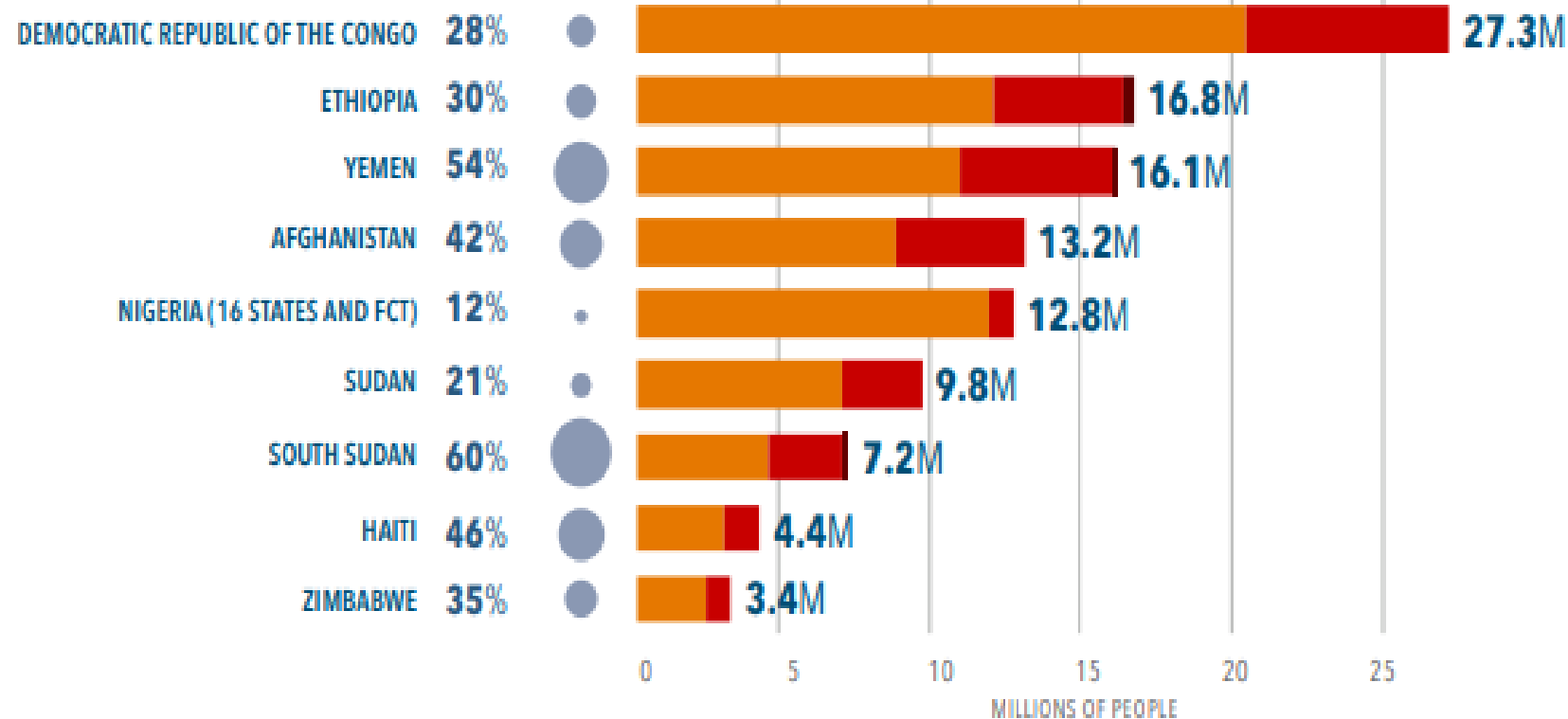
401 000 Ethiopia

28 000 South Madagascar

108 000 South Sudan

47 000 Yemen

## By September 2021, around 111 million people were in Crisis or worse (IPC/CH Phase 3 or above) in nine out of the 10 largest food crises of 2020



Data was not available for the Syrian Arab Republic in 2021, where 12.4 million people were estimated to be acutely food-insecure and in need of urgent assistance in 2020.

- Percentage of population analysed in IPC/CH Phase 3 or above (or equivalent)
- Number of people (in millions) in IPC/CH Phase 3
- Number of people (in millions) in IPC/CH Phase 4
- Number of people (in millions) in IPC Phase 5

Food Insecurity can cause Conflict

- Slave uprising in ancient Egypt (first documented strike)
- French Revolution
- Many governments toppled or regimes changed sparked by inability to manage food shortages (Ethiopia, Haiti)
- Food riots due to high food prices 2007-08
- Arab Spring

# Food: strategic war weapon

- Sieges
- Favour ethnic or other groups

# Natural resources and conflict

# Natural Resources and conflict

- Most conflicts occur in areas where people depend on land and natural resources for their livelihoods
- Many due to access to and control over natural resources: more likely to relapse
- Scarcities do not necessarily end in conflict: other factors
  - Contextual factors: ethnic/religious fractionalization; institutions that could address scarcity issues

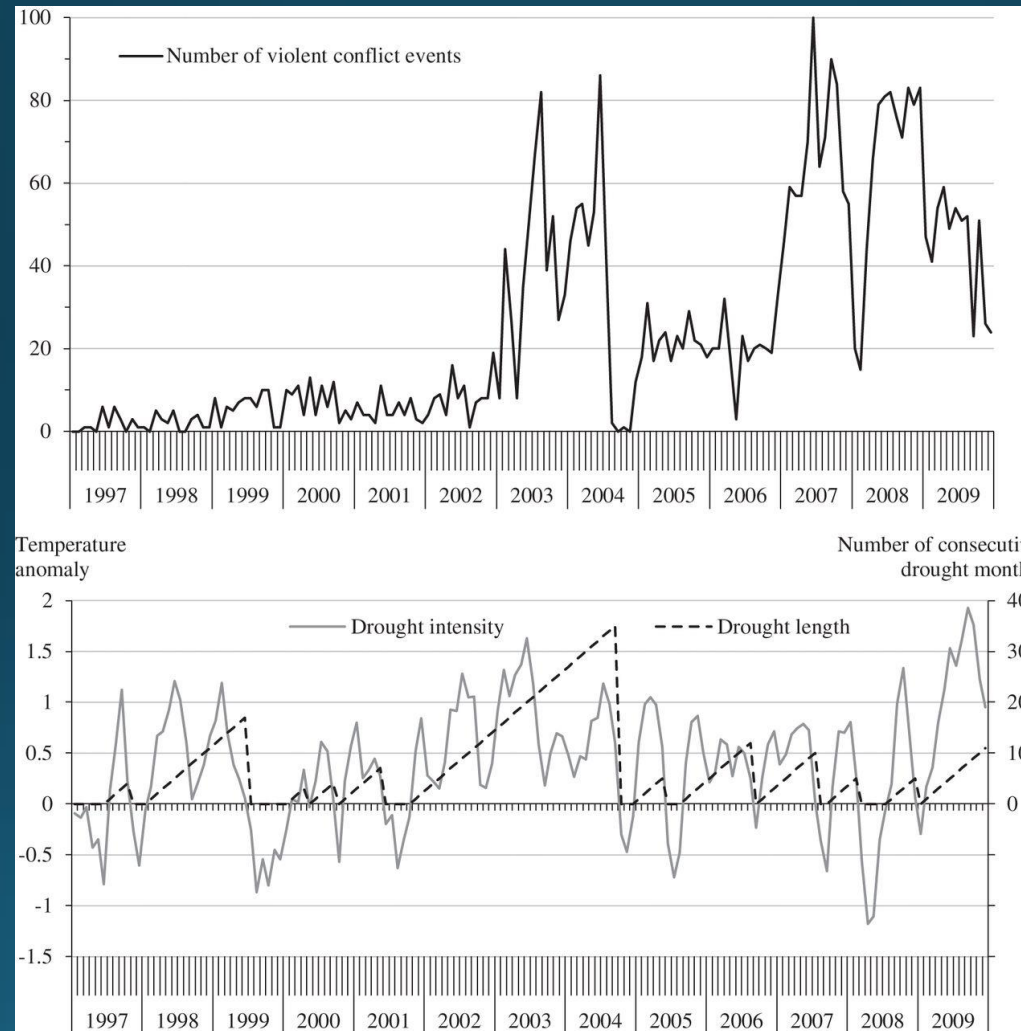
Drought/Water and conflict



# Evidence

- Temperature extremes and rainfall variability contributed to civil war in East Africa
- Rebel and communal conflict events increases 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.

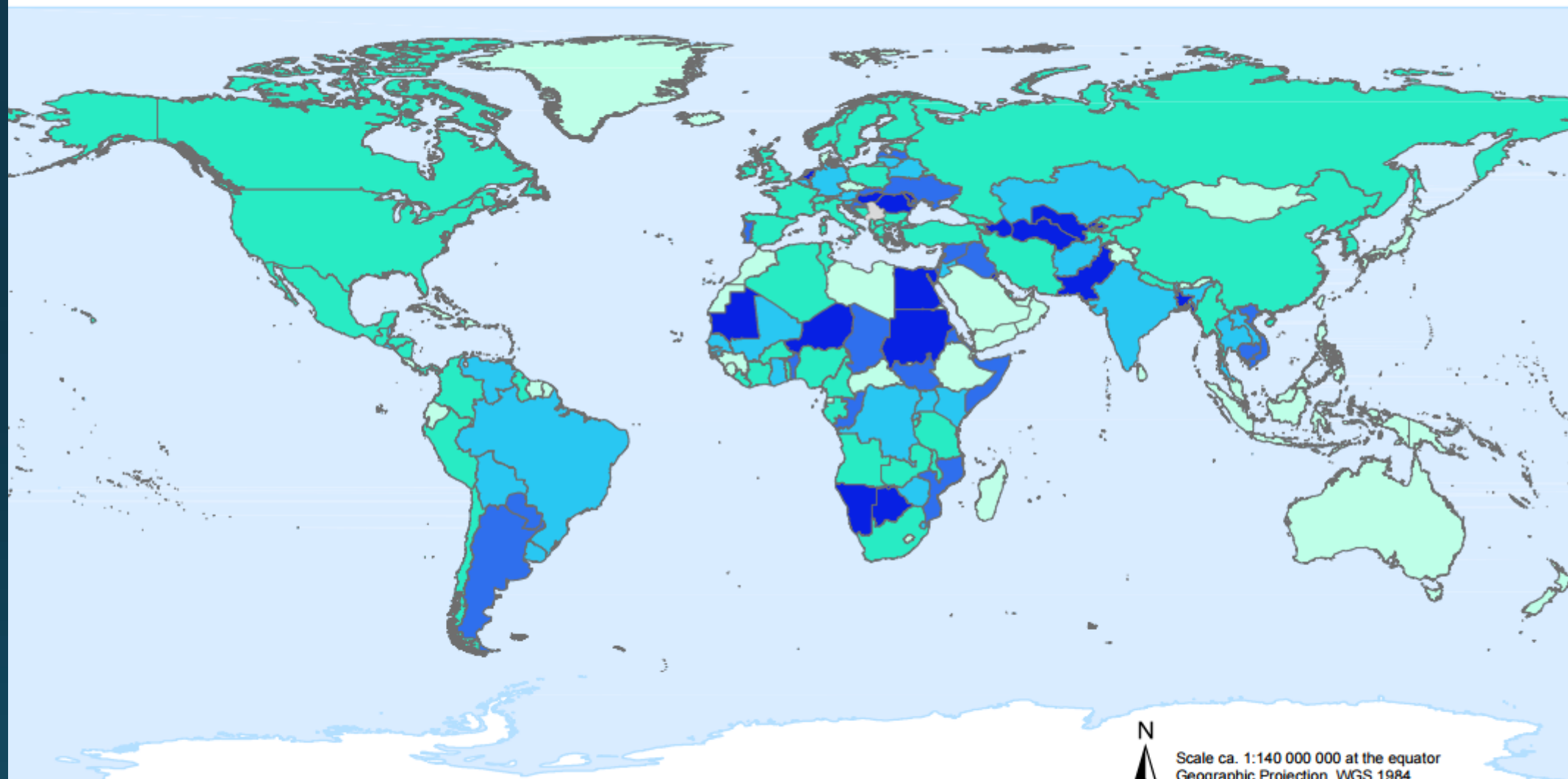


Jean-François Maystadt, and Olivier Ecker *Am. J. Agr. Econ.* 2014;96:1157-1182

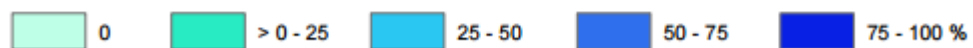


# Contribution of transboundary water to the total renewable water resources (%)

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



## Dependency ratio



Source: AQUASTAT  
Geographic Projection

**FAO - AQUASTAT, 2015**

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Photograph: Abdulkareem Alayashy

# Conclusions

- World food system produces growing hunger while enough food produced to feed all and one third is lost or wasted
- Alarming picture of the planet's natural resources –overuse, misuse, degradation, pollution and increasing scarcity.
- Hunger is increasing due to conflict, climate change and economic downturn
- Climate change's impact on agriculture is mostly about too much or too little water
- Agriculture is the largest user of water globally and will need to become increasingly efficient
- Water availability and use underlie hunger and also conflict
- Number of people living in extreme water scarcity will continue to increase
- Hunger will not be eradicated by 2030 without addressing water use and conflicts
- SDG objectives are closely interlinked. Solutions need to go across SDGs

Thank you