



FOOD AND WATER SECURITY

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Challenges

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Food Security - Definition

- **“Food security** exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” 1996 World Food Summit.
- **“Food insecurity**, on the other hand, is defined by the United States Department of Agriculture (USDA) as a situation of “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.”
- 4 Dimensions + 2 new dimensions (Agency and Sustainability).

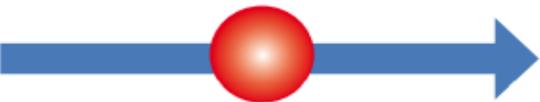
From this definition, **four main dimensions of food security** can be identified:

Physical AVAILABILITY of food	Food availability addresses the “supply side” of food security and is determined by the level of food production, stock levels and net trade.
Economic and physical ACCESS to food	An adequate supply of food at the national or international level does not in itself guarantee household level food security. Concerns about insufficient food access have resulted in a greater policy focus on incomes, expenditure, markets and prices in achieving food security objectives.
Food UTILIZATION	Utilization is commonly understood as the way the body makes the most of various nutrients in the food. Sufficient energy and nutrient intake by individuals is the result of good care and feeding practices, food preparation, diversity of the diet and intra-household distribution of food. Combined with good biological utilization of food consumed, this determines the <i>nutritional status</i> of individuals.
STABILITY of the other three dimensions over time	Even if your food intake is adequate today, you are still considered to be food insecure if you have inadequate access to food on a periodic basis, risking a deterioration of your nutritional status. Adverse weather conditions, political instability, or economic factors (unemployment, rising food prices) may have an impact on your food security status.

For food security objectives to be realized, all four dimensions must be fulfilled **simultaneously**.

Food Insecurity - Definition

Food security analysts have defined **two general types of food insecurity**:

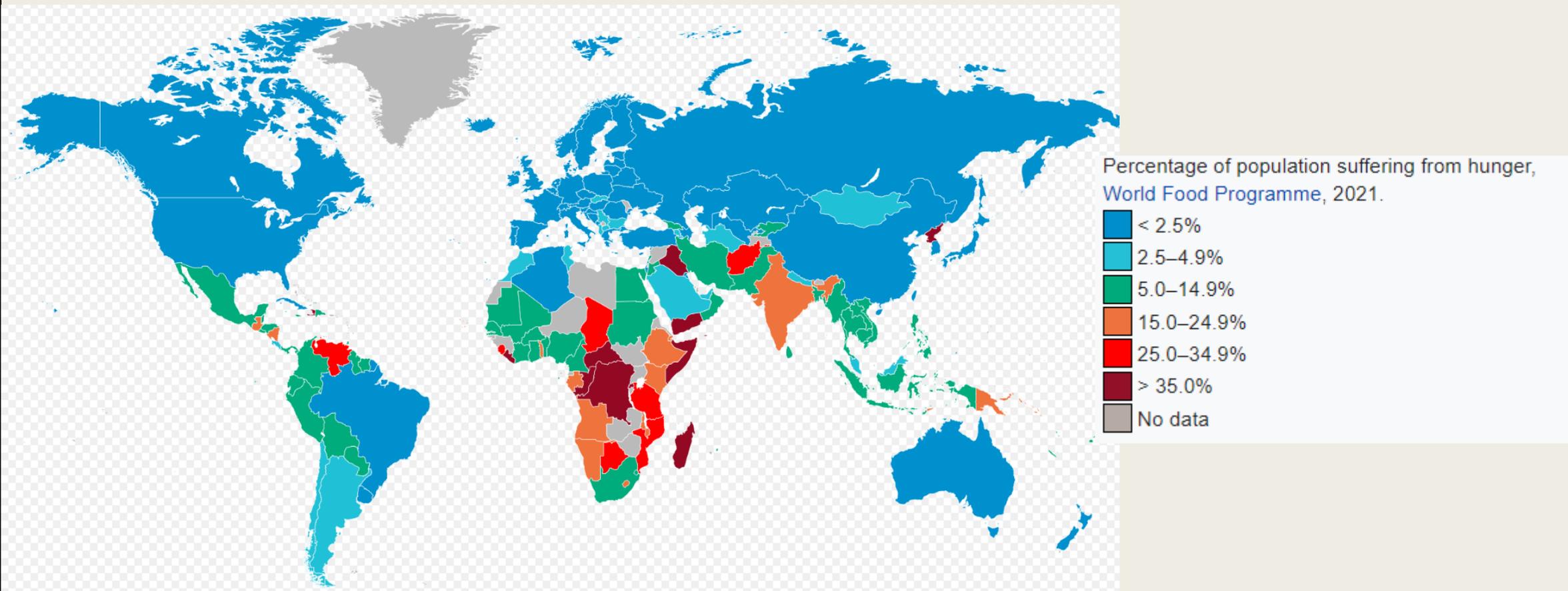
	CHRONIC FOOD INSECURITY	TRANSITORY FOOD INSECURITY
		
is...	long-term or persistent.	short-term and temporary.
occurs when...	people are unable to meet their minimum food requirements over a sustained period of time.	there is a sudden drop in the ability to produce or access enough food to maintain a good nutritional status.
results from...	extended periods of poverty, lack of assets and inadequate access to productive or financial resources.	short-term shocks and fluctuations in food availability and food access, including year-to-year variations in domestic food production, food prices and household incomes.
can be overcome with...	typical long term development measures also used to address poverty, such as education or access to productive resources, such as credit. They may also need more direct access to food to enable them to raise their productive capacity.	transitory food insecurity is relatively unpredictable and can emerge suddenly. This makes planning and programming more difficult and requires different capacities and types of intervention, including early warning capacity and safety net programmes (see Box 1).

IPC Phase Classification	Indicators
Generally food secure	- Crude Mortality Rate
Chronically food insecure	- Malnutrition prevalence
Acute food and livelihood crisis	- Food Access/ Availability
Humanitarian emergency	- Dietary Diversity
Famine / humanitarian catastrophe	- Water Access/Availability
	- Coping strategies
	- Livelihood Assets

IPC – Integrated Food Security Phase Classification

IPC Phase Number	Phase	Description
1	Generally Food Secure	More than 80% of households can meet basic food needs without atypical coping strategies
2	Borderline Food Insecure	For at least 20 percent of households, food consumption is reduced but minimally adequate without having to engage in irreversible coping strategies. These households cannot fully meet livelihoods protection needs.
3	Acute Food and Livelihood Crisis	At least 20 percent of households have significant food consumption gaps OR are marginally able to meet minimum food needs only with irreversible coping strategies such as liquidating livelihood assets. Levels of acute malnutrition are high and above normal.
4	Humanitarian Emergency	At least 20 percent of households face extreme food consumption gaps, resulting in very high levels of acute malnutrition and excess mortality; OR households face an extreme loss of livelihood assets that will likely lead to food consumption gaps.
5	Famine/Humanitarian Catastrophe	At least 20 percent of households face a complete lack of food and/or other basic needs and starvation, death, and destitution are evident; and acute malnutrition prevalence exceeds 30%; and mortality rates exceed 2/10000/day

Hunger in the World



Food Security – General Info

- 281.6 million people in Africa face hunger (2021).
- Food security situation is determined by several drivers including conflicts, climate variability and extremes, economic slowdowns and downturns, and the unaffordability of healthy diets.
- Food and Agriculture Organization of the United Nations, FAO (1945).
- World Food Programme (WFP), the International Fund for Agricultural Development (IFAD), the World Health Organization (WHO), and the United Nations Children's Fund (UNICEF) - **State of Food Security and Nutrition in the World - SOFI**
- The biggest deterioration occurred between 2019 and 2020.
- 125.1 million people live in Eastern Africa, followed by Western Africa (75.2 million), Central Africa (68.8 million), and Northern Africa (6.8 million).

TABLE 1
Prevalence of undernourishment (percent)

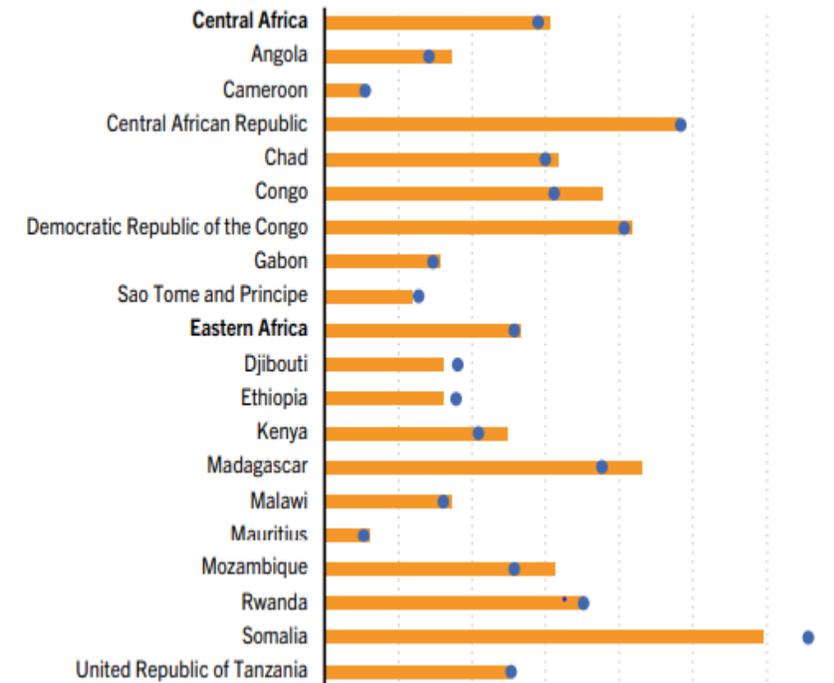
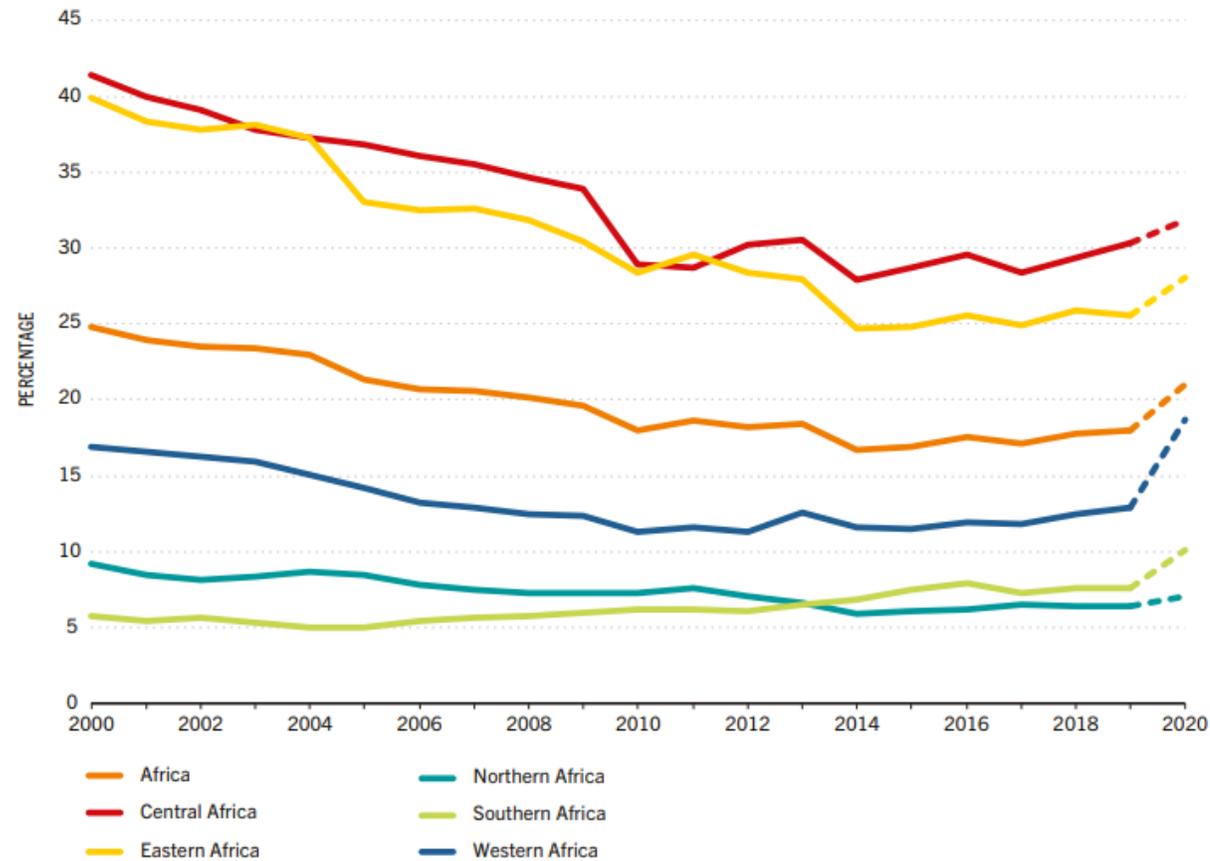
	2000	2010	2014	2015	2019	2020
World	13.0	9.2	8.3	8.3	8.4	9.9
Africa	24.8	18.0	16.7	16.9	18.0	21.0
Central Africa	41.4	28.9	27.9	28.7	30.3	31.8
Eastern Africa	39.9	28.4	24.7	24.8	25.6	28.1
Northern Africa	9.2	7.3	5.9	6.1	6.4	7.1
Southern Africa	5.8	6.2	6.8	7.5	7.6	10.1
Western Africa	16.9	11.3	11.6	11.5	12.9	18.7

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Food Security - FAO

FIGURE 2

Prevalence of undernourishment in Africa by subregion



Food Security

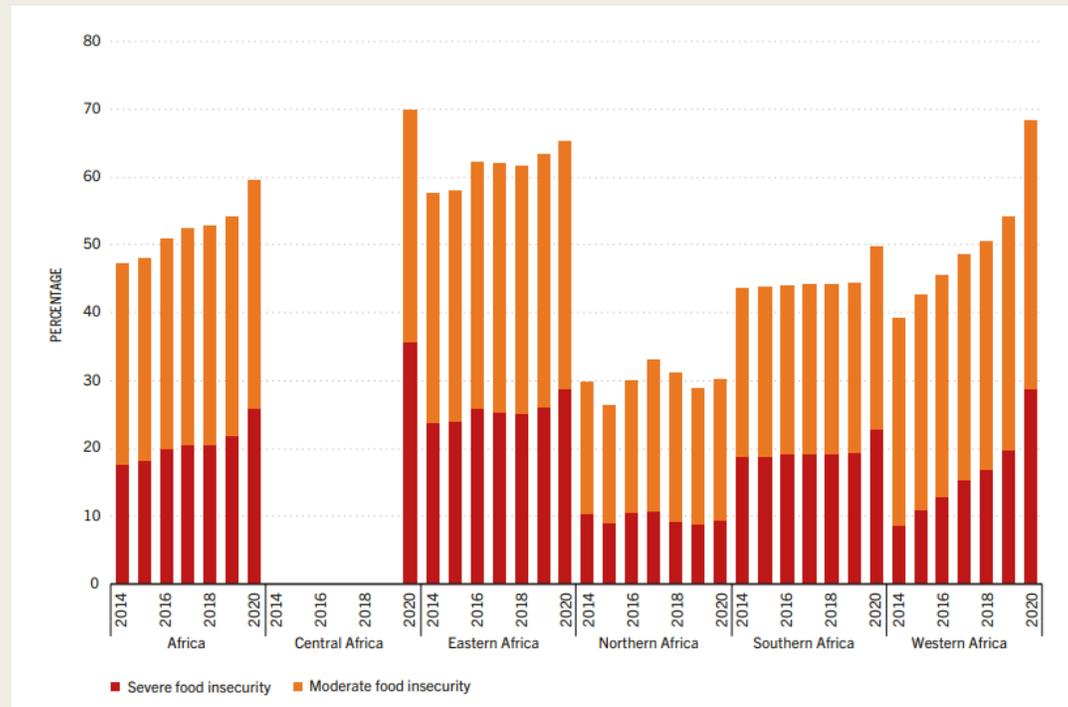
- Shared vision of humanity and a social contract between the world's leaders.



Food Security - FAO

- The Food Insecurity Experience Scale - (FIES) :

- a) Moderate food insecurity (uncertain ability to obtain food and have been forced to reduce, at times over the year, the quality and/or quantity of food they consume due to lack of money or other resources.
- b) Severe food insecurity (run out of food, experienced hunger and, at the most extreme, have gone for days without eating)



Food Security - FAO

- Food security and nutrition indicators:
 - a) Undernourishment
 - b) Food Insecurity Experience Scale
 - c) Stunting, wasting and overweight in children under five years of age
 - d) Low birthweight
 - e) Adult obesity
 - f) Anaemia in women of reproductive age
 - g) Exclusive breastfeeding

Global Food Security Index

Overall food security environment: the top- and bottom-ranking countries in 2022

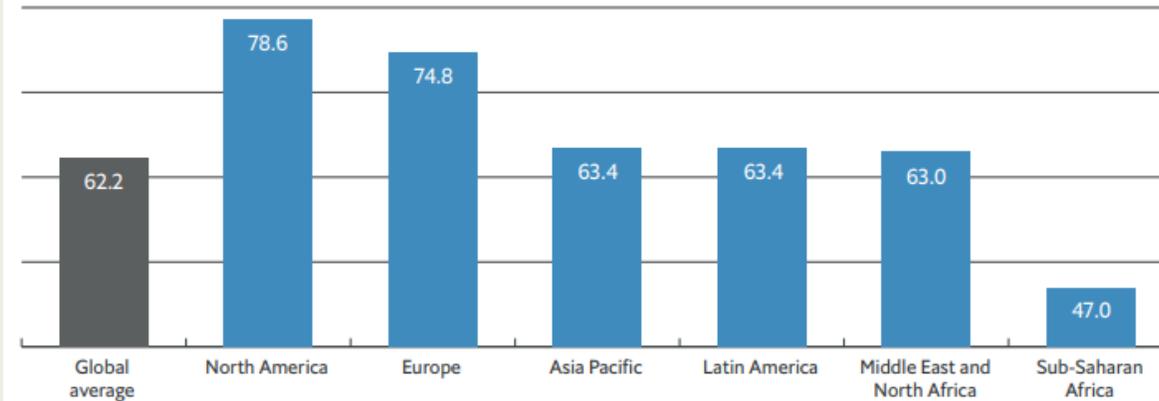
Best performers	2022 score
Finland	83.7
Ireland	81.7
Norway	80.5
France	80.2
Netherlands	80.1
Japan	79.5
Canada	79.1
Sweden	79.1
United Kingdom	78.8
Portugal	78.7

Weakest performers	2022 score
Syria	36.3
Haiti	38.5
Yemen	40.1
Sierra Leone	40.5
Madagascar	40.6
Burundi	40.6
Nigeria	42
Venezuela	42.6
Sudan	42.8
Congo (Dem. Rep.)	43

Global Food Security Index

Overall GFSI 2022 scores, by region

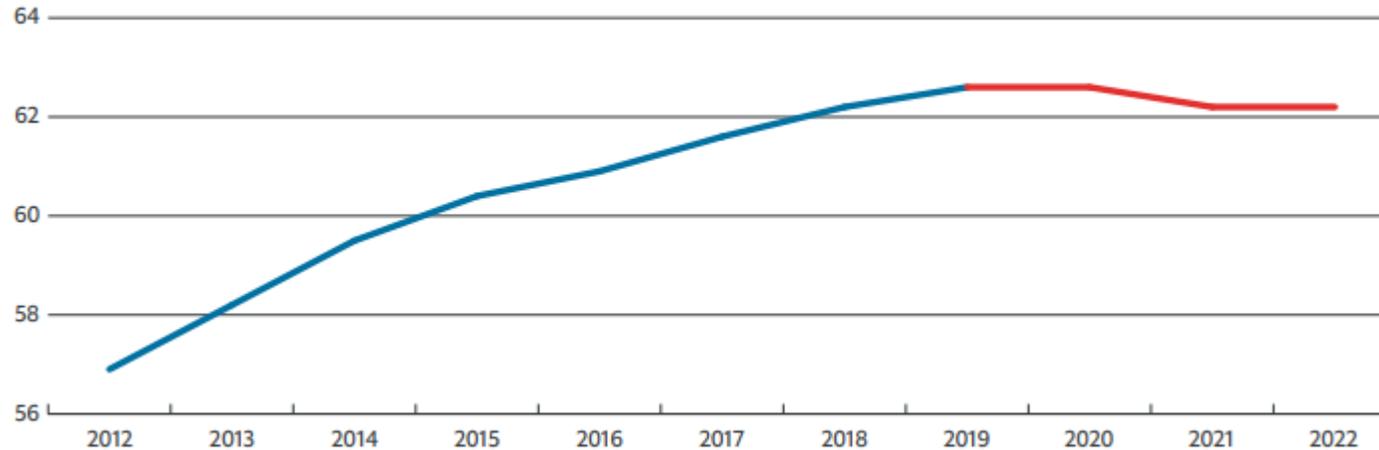
In 2022, besides Sub-Saharan Africa, all regions performed above the global average, with North America leading the index.



Source: Global Food Security Index 2022.

GFSI average overall score, global 2012-22

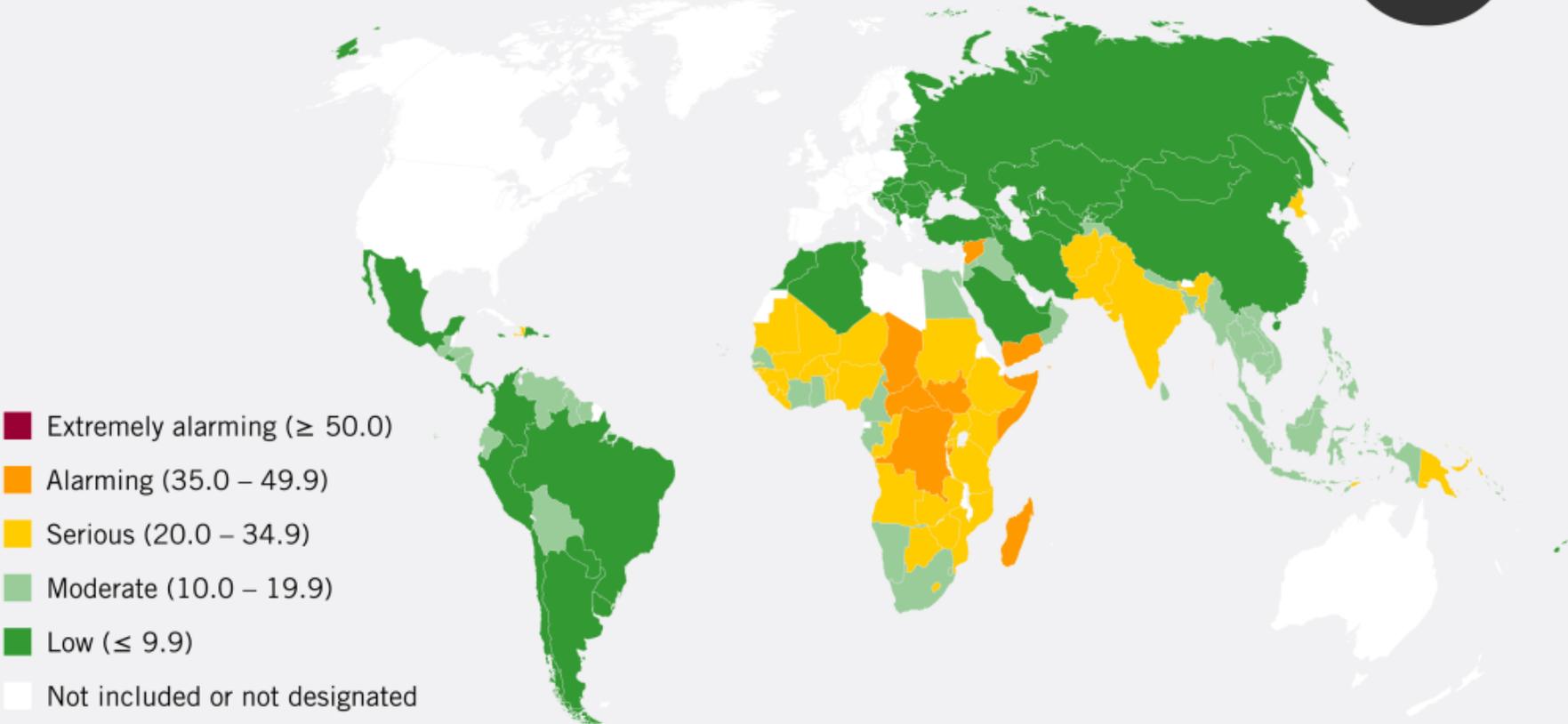
After climbing year on year between 2012 to 2018, the overall food security score has not improved since 2019.



Source: Global Food Security Index 2022.

Global Hunger Index

2022 GLOBAL HUNGER INDEX



Global Hunger Index



Undernourishment



Child stunting



Child wasting



Child mortality

- Measures inadequate food access, an important indicator of hunger
- Refers to the entire population, both children and adults
- Is used as a lead indicator for international hunger targets, including Sustainable Development Goal 2 (Zero Hunger)

- Go beyond calorie availability, consider aspects of diet quality and utilization
- Reflect children's particular vulnerability to nutritional deficiencies
- Are sensitive to uneven distribution of food within the household
- Are used as nutrition indicators for SDG 2 (Zero Hunger)

- Reflects that death is the most serious consequence of hunger, and children are the most vulnerable
- Improves the GHI's ability to reflect deficiencies of essential vitamins and minerals
- Stunting and wasting only partially capture the mortality risk of undernutrition

Land Grabbing: A New Challenge to Global Food Security

Table 5.1 Recently Signed “Land Grab” Deals

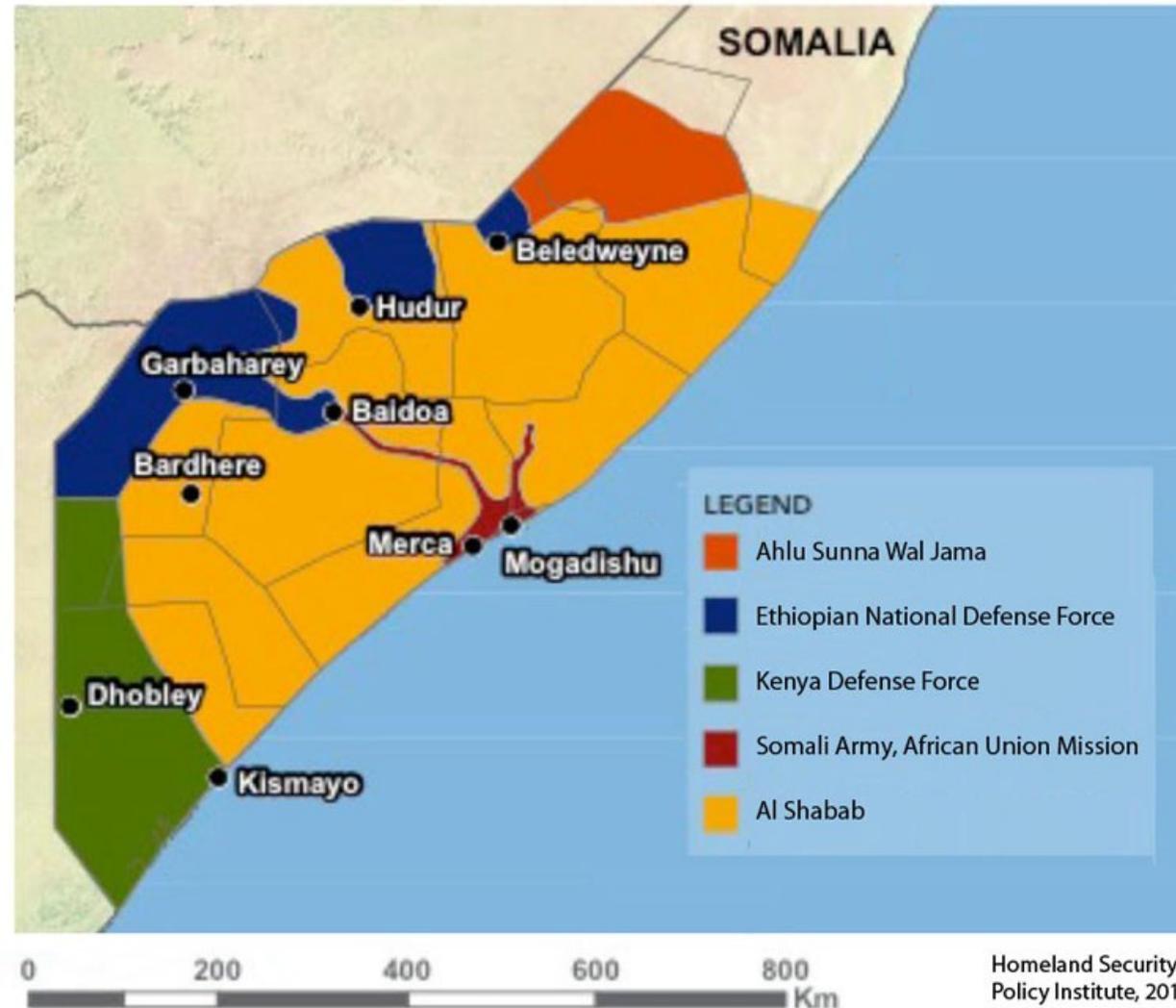
<i>Investor</i>	<i>Type of investor</i>	<i>Target country</i>	<i>Plot size (ha)</i>
Bahrain	government	Philippines	10 000
China	private entity (ZTE)	DR Congo	2 800 000
China	private entity (ZTE)	Laos	700 000
China	government	Zimbabwe	101 171
Egypt	government	Sudan	Unspecified (land to grow 2 million tons of wheat annually)
India	private companies	Ethiopia	359 100
Jordan	government	Sudan	25 000
Libya	government	Mali	100 000
Libya	government	Ukraine	250 000
Qatar	government	Kenya	40 000
Qatar	government	Philippines	100 000
Saudi Arabia	private company	Sudan	9 200–10 117
South Korea	private company	Sudan	690 000
Switzerland	private company	Sierra Leone	26 000
UAE	private company	Pakistan	324 000
UAE	government	Sudan	378 000
UK	private company	Ukraine	100 000

Droughts in Eastern Africa

- Two main rainy seasons per year: the so-called long rains from March-April to May-June, the so-called short rains from October to December.
- Eastern Africa has experienced severe weather in recent decades, including **intense droughts in 1996, 1998, 2005, 2011-2012, 2016 and 2020-2022.**
- 2022 - A total of 70 million people are exposed to some level of drought risk in East Africa.
- Drought and Famine 2011 - approx. 250 thousand deaths.
- Causes of food crises and famine in the East African region:
 - a) Natural causes (Droughts, Soil Quality)
 - b) Social and demographic causes (Low agricultural productivity, Poverty, AIDS, Environmental degradation, Population growth)
 - c) Economic and political-security causes (International trade, Government policy/Government disinterest, Armed conflicts)
 - d) Climate change?

Droughts in Eastern Africa

Estimate of al-Shabab-controlled territory as of 2013



Droughts in Eastern Africa

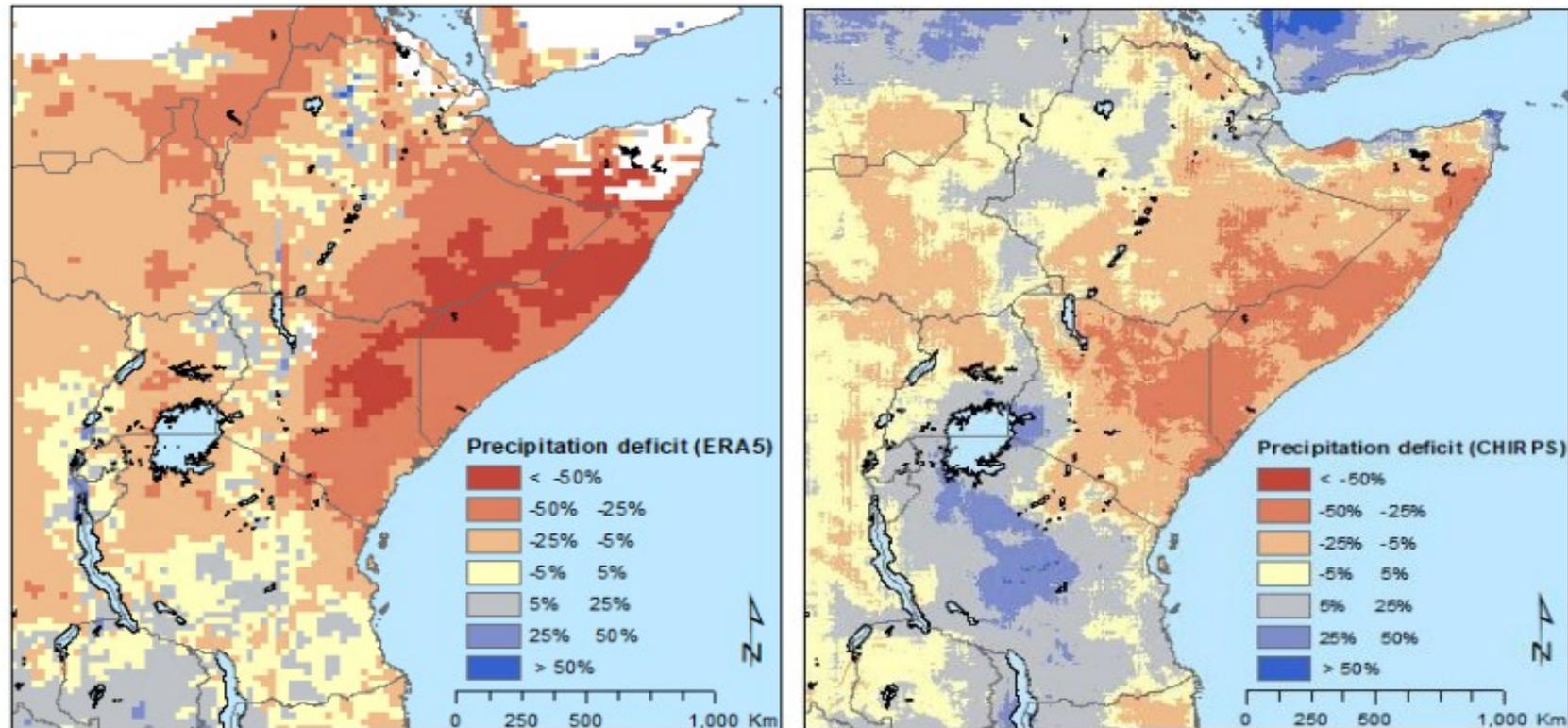


Figure 1 Precipitation deficit % compared to the reference period (1981-2020) for the period July 2020 – June 2022 according to the ECMWF ERA5 reanalysis (left panel) and CHIRPS dataset (right panel). Desert areas (based on climatology) and water bodies are masked out in ECMWF ERA5 reanalysis.

Water Security

- Broad vs. Narrow definition:

“Water security is the reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks.,”

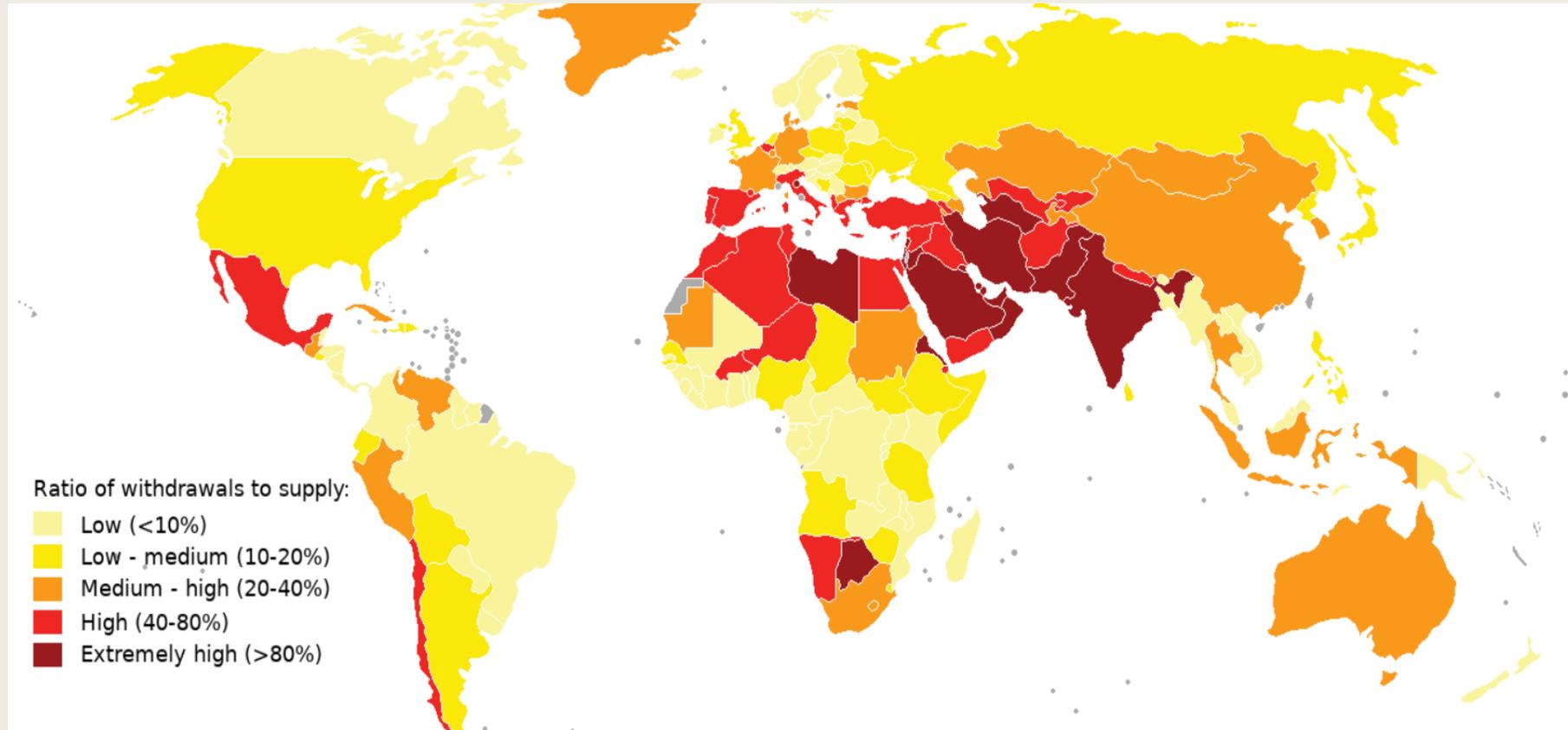
“Water security is defined as the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being , and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.”

"Water security refers to the availability of water, in adequate quantity and quality, to sustain all these needs together (social and economic sectors, as well as the larger needs of the planet's ecosystems) – without exceeding its ability to renew.,”

- **World Water Council (WWC)** and the **Global Water Partnership (GWP)**.
- The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) was adopted in Helsinki in 1992 and entered into force in 1996.
- UN Water.

Water Scarcity

- **Water scarcity** - lack of fresh water resources to meet the standard water demand.
- Physical vs. economic water scarcity.



Water Conflicts

- Water conflict is a term describing a conflict between countries, states, or groups over the rights to access water resources.
- Intrastate or interstate levels.
- Water-related conflicts can be categorized:
 - A) Trigger
 - B) Weapon
 - C) Causality
- A comprehensive online database of water-related conflicts—the Water Conflict Chronology—has been developed by the Pacific Institute.
- Transboundary water conflicts:
 - a) Tigris and Euphrates Rivers
 - b) Mekong basin (China and other Asian countries)
 - c) Dispute over water in the Nile Basin

Grand Ethiopian Renaissance Dam



- Agreement on Declaration of Principles between The Arab Republic of Egypt, The Federal Democratic Republic of Ethiopia And The Republic of the Sudan On The Grand Ethiopian Renaissance Dam Project (2015)

Water Conflicts in Africa

- 316 trigger conflicts, 127 - more than 40%, took place in sub-Saharan Africa
- Examples of conflicts:
 - A) Ethiopian and Somali Nomads Clashed Over Desert Water (1963–1964)
 - B) South Africa Seized Control of the Angola Dam (1975)
 - C) Water Shortages due to Drought Contributed to the Start of the Arab-Fur War (1987–1989)
 - D) Military Clashes Between Cameroon and Nigeria Over the Retreat of Lake Chad (1980s and 1990s)
 - E) African Nations Disputed the Island of Zambezi - Sedudu (1999–2000)
 - F) Violent Conflict Between Kenyan and Ugandan Herders (2012)

Dam	Area (km ²)	Maximum depth (m)	Volume (km ³)	Power (MW)
Akasombo Dam	8,502	70	150	1.020
Kariba Dam	5,400	100	180	1.626
Aswan	5,250	9	162	2.100
Cahora Bassa Dam	2,739	100	52	2.070
Renaissance Dam	1,874	140	74	6.450

Development and Conflict Traps – Paul Collier

- The Bottom Billion: Why the Poorest Countries are Failing and What Can Be Done About It
- Four traps:
 - a) Conflict Trap
 - b) Natural Resource Trap
 - c) Landlocked with Bad Neighbours
 - d) Bad Governance in a Small Country

Thank you for your
attention