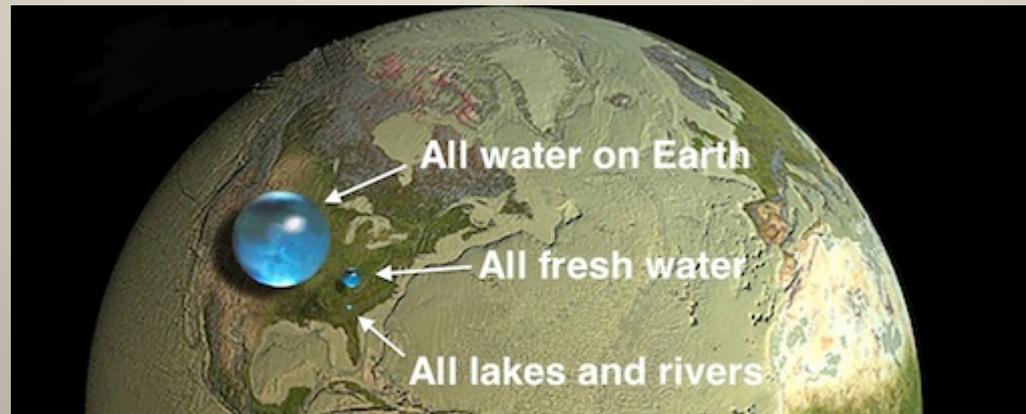
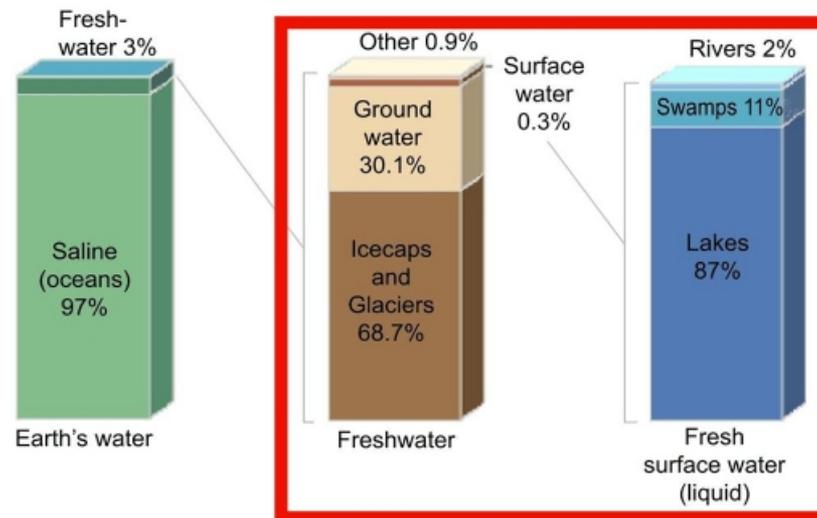


Water and food in Africa

Terje Oestigaard



Distribution of Earth's Water



A water system perspective

- **The first layer: the physical form and behaviour of actual waterscapes**
- **The second layer: human modifications and adaptations to the actual water-worlds**
- **The third layer: the cultural, ideological and religious concepts of water, including laws**

- Tvedt, T. & Oestigaard, T. (eds.). 2016. *A History of Water, Series 3, Vol. 3. Water and Food: From hunter-gatherers to global production in Africa*. I.B. Tauris. London.

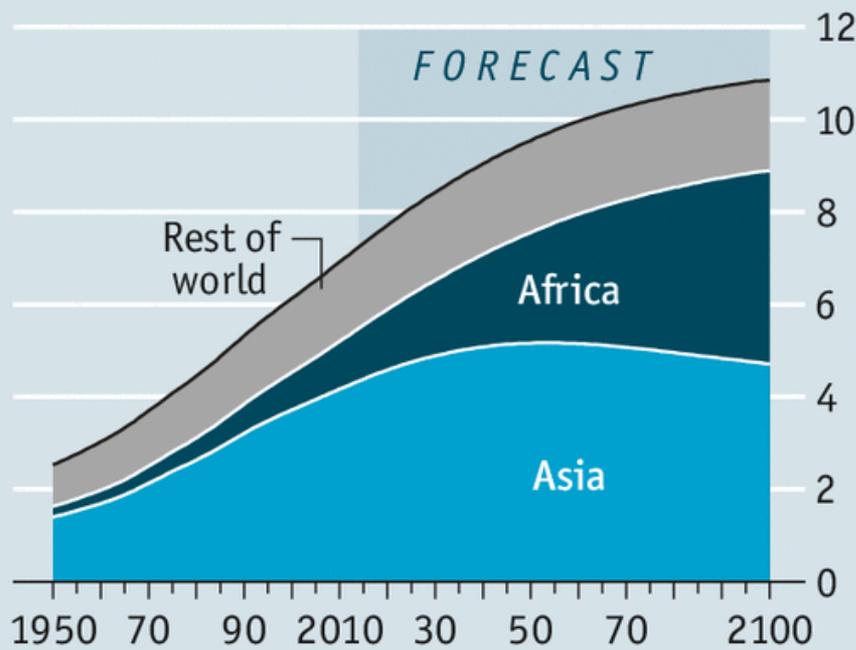
- Agro-water variability

- Will there be enough water for food production?
- Need for 70-90% more food in 2050
- Need for 70-90% more water in agriculture – from 7130 km³ – to 12-13500 km³
- Africa food self-sufficient in 1960s
- Very few now share the widespread optimism of the early 1970s, when the world's population turned four billion and the then US Secretary of State Henry Kissinger proclaimed that 'no child will go to bed hungry within ten years.
- Malthus or Boserup?

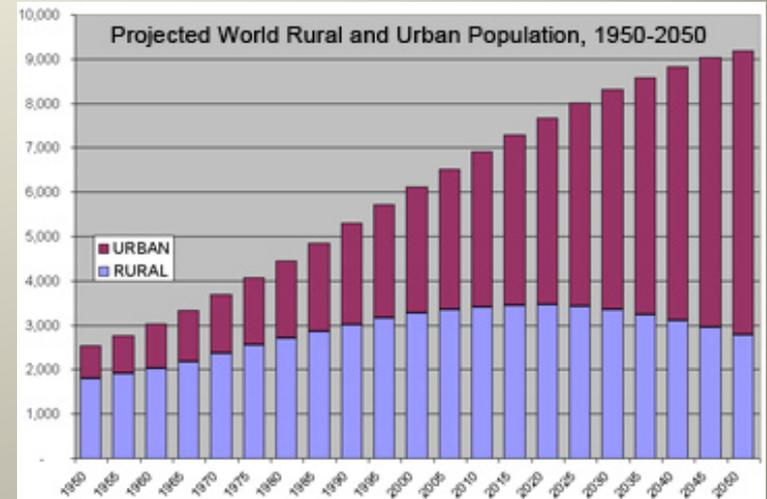


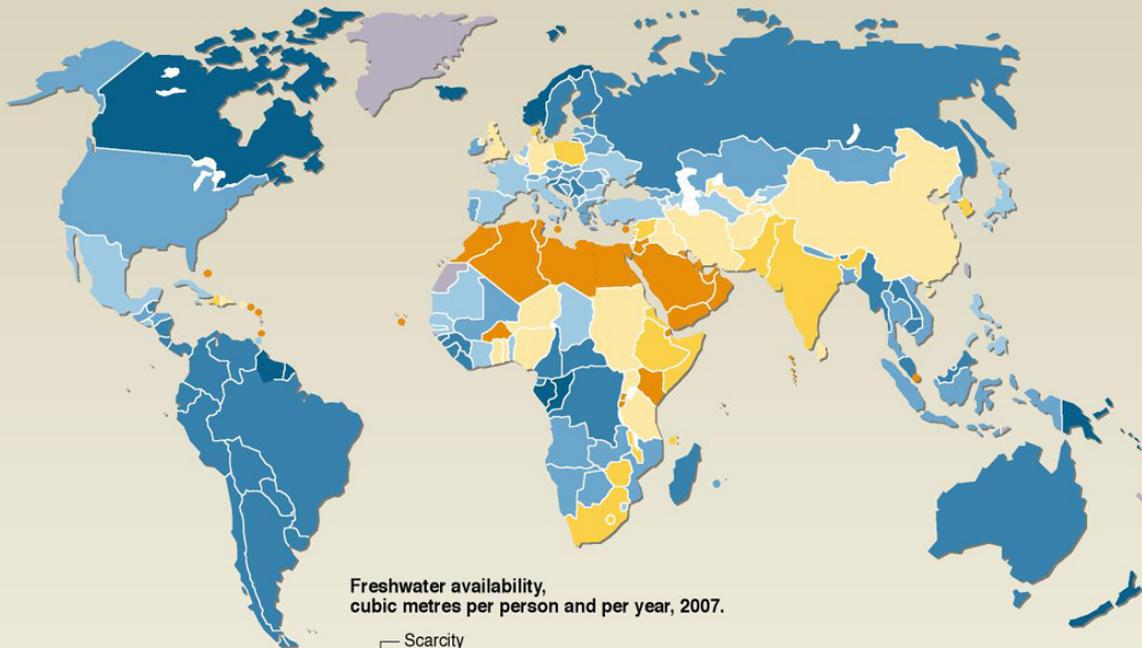
The African bulge

Population, bn



Source: UN





Source: FAO, Nations unies, World Resources Institute (WRI).

PHILIPPE REKACEWICZ
FEBRUARY 2008

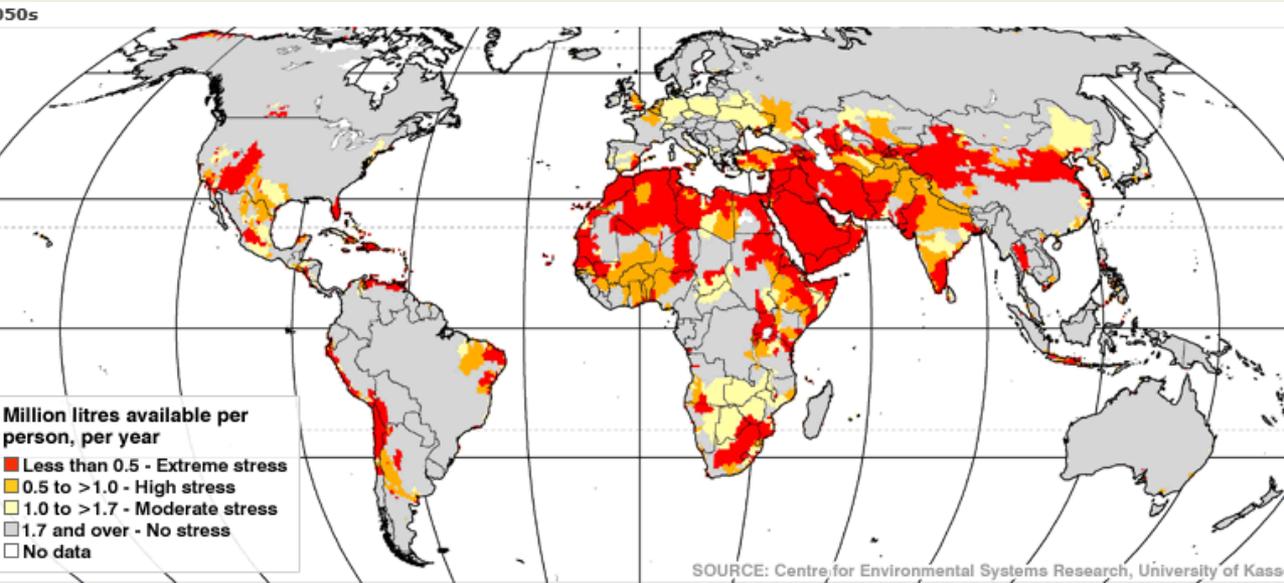
Falkenmark Water Stress Indicator

Sufficient
1700 m³

Water stress
1000 - 1700 m³

Scarcity
500 - 1000 m³

Extreme scarcity
< 500 m³



Agriculture is the largest consumer of fresh water.

About 70 per cent of global water consumption is for agriculture, however, in least developed countries, agriculture accounts for more than 90 per cent of fresh-water withdrawals.

About 50 per cent of African land is vulnerable to desertification and degradation. This is expected to lead to large cultivation losses in parts of sub-Saharan Africa. By 2050, annual river run-off and water availability will be reduced by 10 – 30 per cent in dry regions.

In sub-Saharan Africa, about 95 per cent of the agriculture is rain-fed, and is highly vulnerable. If the rains fail, or are abundant at the wrong time, harvests may fail, leading to famine and even death.

African economy is identified as dominantly agrarian and dependent on the smallholder farmers. Smallholder agriculture (farm sizes less than 2 hectares) accounts for about 80% of all farms in sub-Saharan Africa, employs about 65% of Africa's labour force (175 million people directly employed), and about 70% of all smallholders are women.

To produce enough food to satisfy a person's daily needs requires 2 – 3,000 litres of water, but one litre of biofuel also needs 2,500 – 3,500 litres of water.

Agro-water variability

From the tropical rainforests receiving up to 5000 mm rain each year to the deserts in Sahara virtually without a single drop of water for years, the agro-water variability of Africa is extreme.

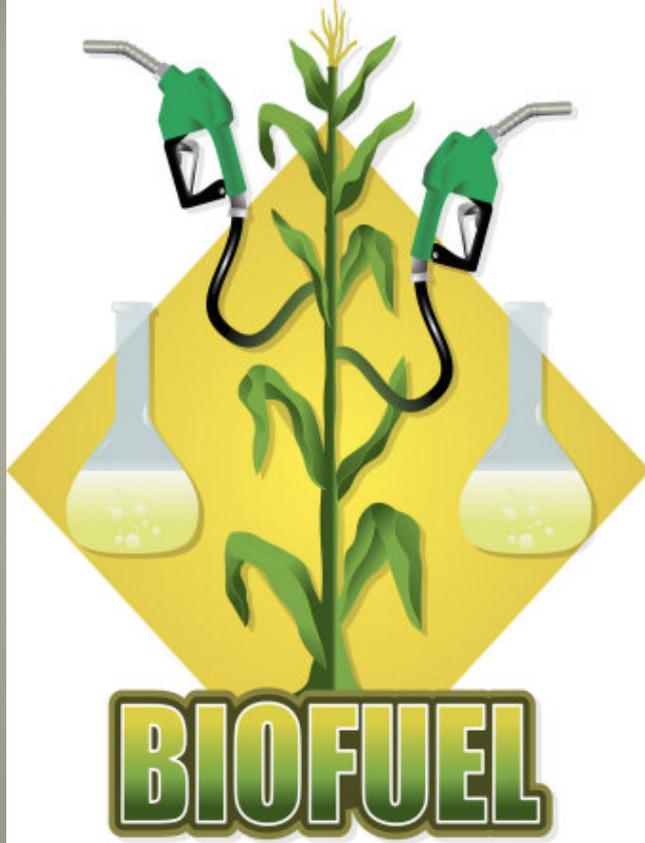
But the agro-water variability of Africa is not a gradient with fading amounts of precipitation from the rainforests to the deserts – from 5000 mm to 0 mm; if this was the case the predictability and adaptability would have been rather straight forward.

If it is one thing that characterizes statistical averages concerning precipitation, it is that the actual rainfall a given year is hardly ever the average; more often than not it is extreme in one way or another. In other words, there is hardly ever a 'normal' year; the erratic and unpredictable rainfall patterns become the 'normal'.













According to the World Food Council:

Food security implies two things. First, ... that food is available, accessible, affordable – when and where needed – in sufficient quantity and quality. Second, it implies an assurance that this state of affairs can reasonably be expected to continue ... that it can be sustained. To put it simply, food security exists when adequate food is available to all people on a regular basis. (World Food Council 1988:2).

The 1996 World Food Summit adopted a still more complex definition:

“Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”.

This definition is again refined in The State of Food Insecurity 2001:

“Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”

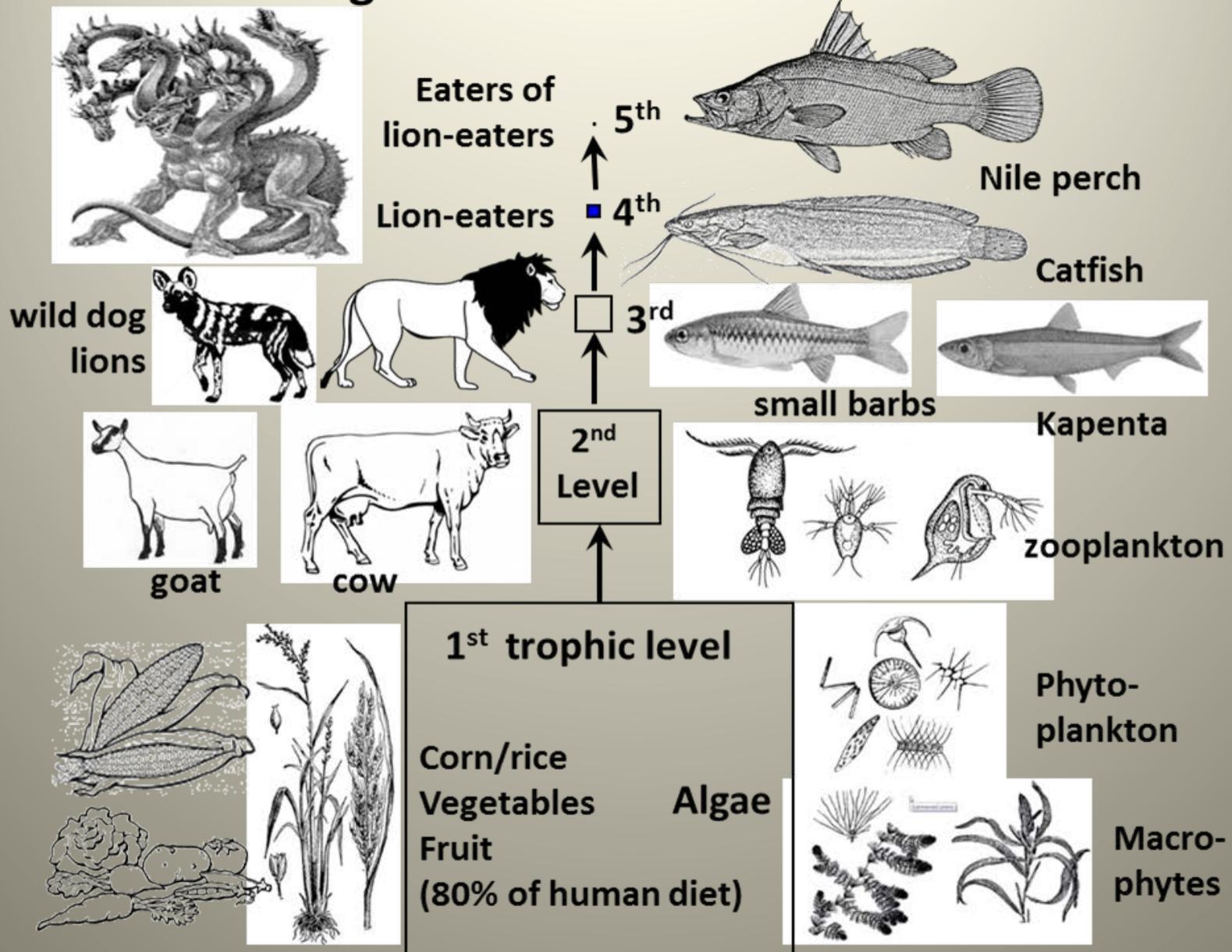
By contrast:

Chronic food insecurity is a continuously inadequate diet caused by the inability to acquire food. It affects households that persistently lack the ability either to buy food or produce their own. Transitory food insecurity is a temporary decline in a household’s access to enough food. It results from instability in food prices, food production, or household incomes – and in its worst form it produces famine. (World Bank 1986:1)



Food chain agriculture

Food chain fisheries



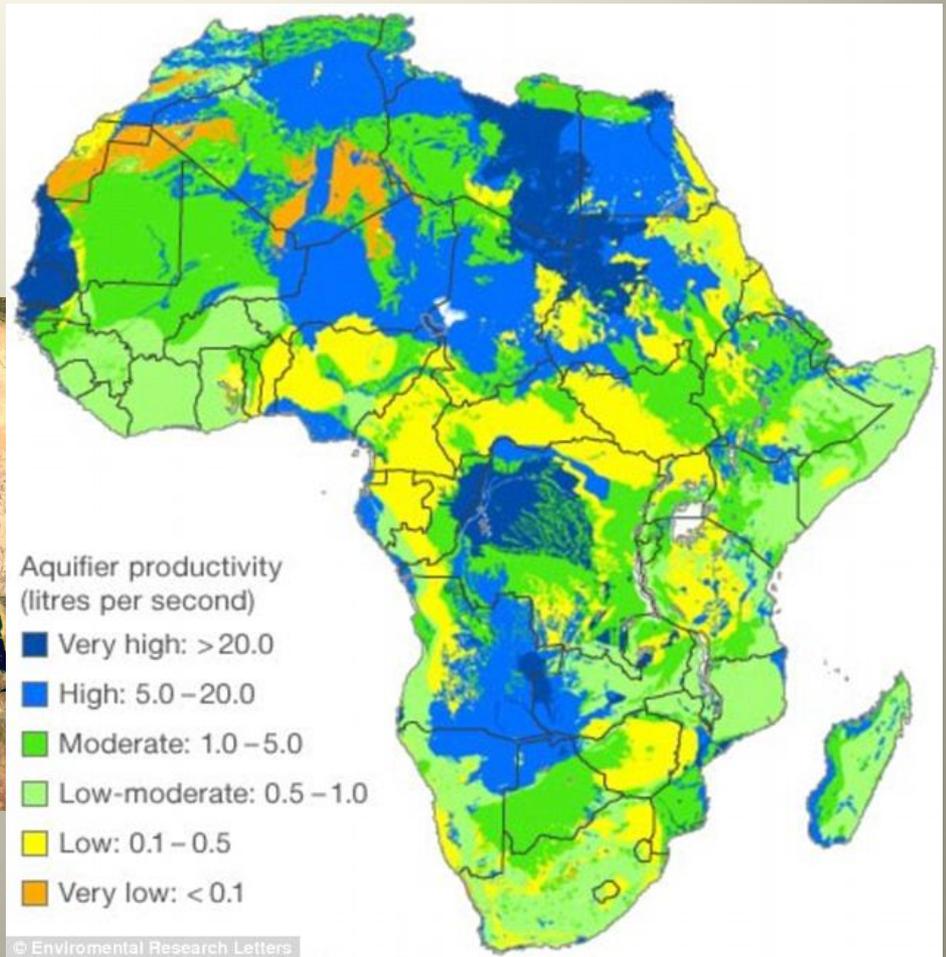
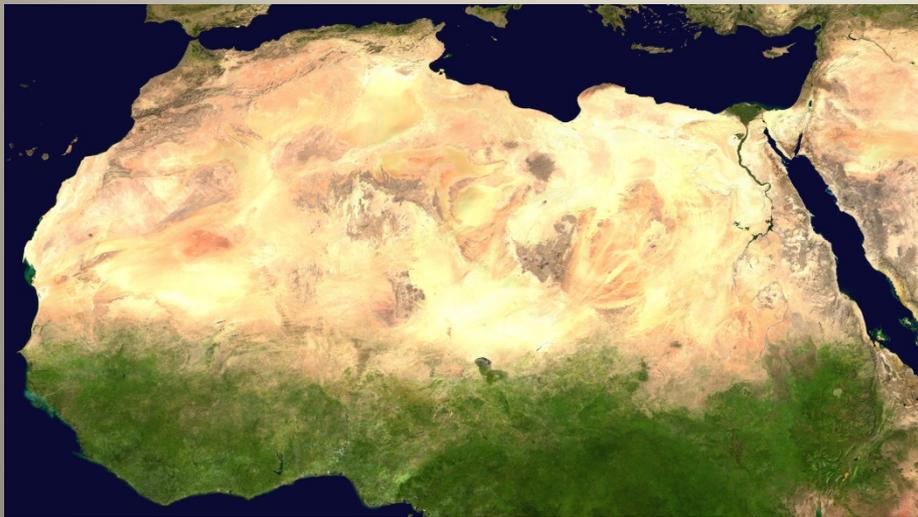
Studies of food production and food producing regimes will benefit from a water system perspective. By separating the distinctive processes at work while at the same time show how the physical, managerial, and political and cultural are related and interconnected at various levels and in different contexts, both environmental determinism and social reductionism can be evaded.

Food production cannot be understood properly without locating the practices within the continent's particular water systems.

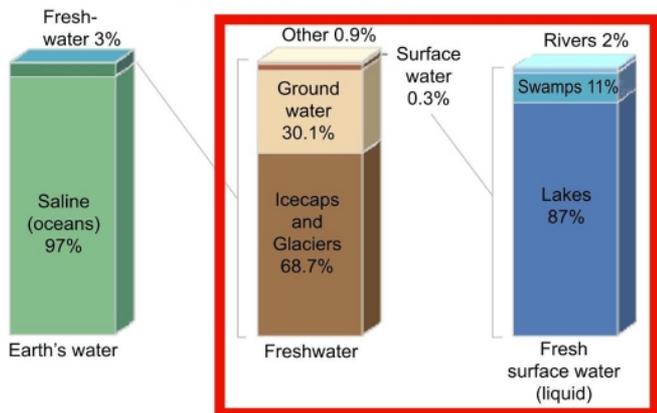
Despite the challenges Africa as a continent has faced with regards to food security throughout millennia, she has also prospered and managed extreme situations remarkable well despite all hardships and sufferings.

The knowledge and experiences based on centuries of traditions have enabled highly functioning and well adaptive structure to extreme, seasonal and varied ecological conditions and water availabilities in time and space. Rapid and dramatic interventions and changes in these resilient structures, whether colonial or not, have had deep impact on society and development, in some cases radically increasing local and national food security, in other cases not.

The *Nubian Sandstone Aquifer System (NSAS)* of NE Africa constitute one of the largest onshore groundwater reservoirs in the World, with some 5% of the planet's total freshwater reserves stored in sandstone aquifers under the Saharan sands.



Distribution of Earth's Water



Ground water in Africa: 100 times the amount found on its surface, or 0.66 million cubic kilometres.

