
EAT WHAT YOU WANT

Climate Change and Food Security: Minimal Impact?

To GWPF London, April 2025

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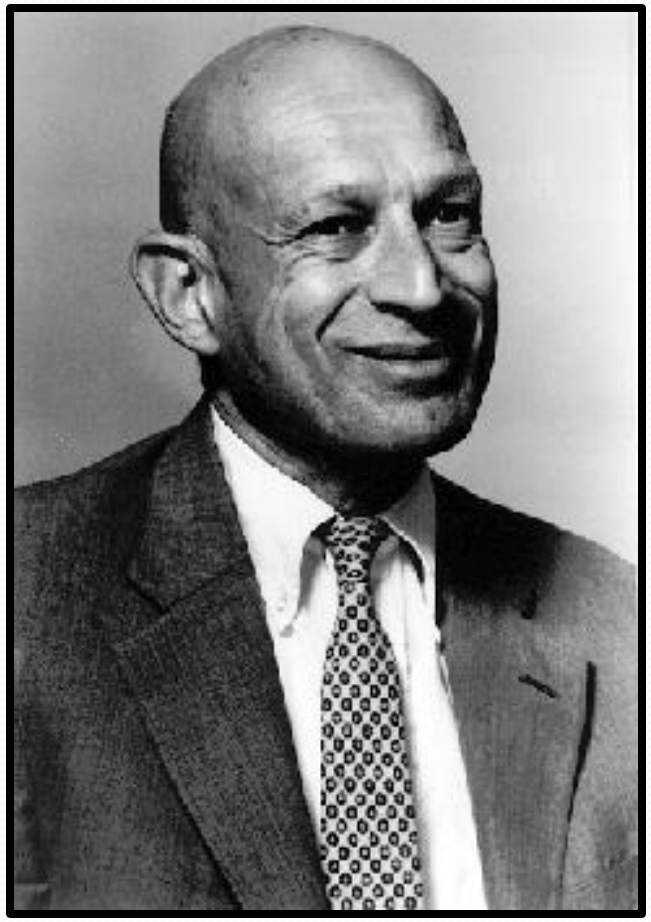
President of Klimarealisme – the Danish Society of Climate Realists
Former President, Dansk Akvakultur
Former Chairman of Copenhagen Institute of Future Studies

The Birth of a Climate Realist, AIT 1997

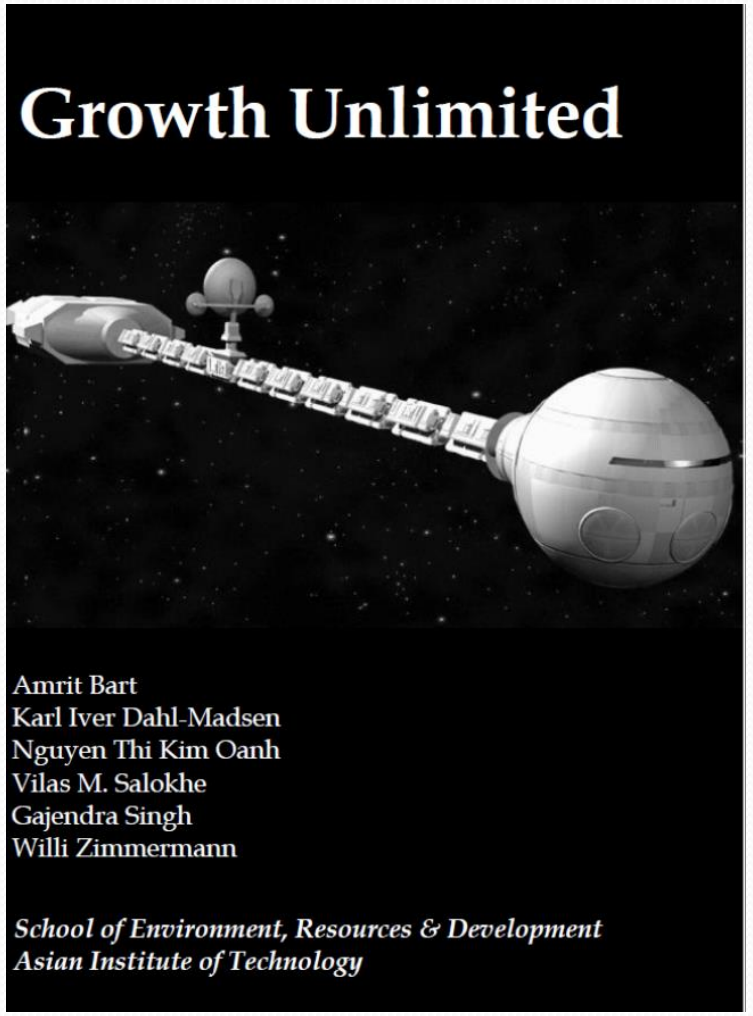


- *The material conditions of life will continue to get better for most people, in most countries, most of the time, indefinitely. Within a century or two, all nations and most of humanity will be at or above today's Western living standards.*
- *I also speculate, however, that many people will continue to think and say, that the conditions of life are getting worse*
- Julian L. Simon

AIT 1997-99 - Growth Unlimited

Global Climate Change: The CO_2 Thermometer?
Nguyen Thi Kim Oanh
"It is evident that the proposed cure of excessive CO_2 emission reductions may well be far more costly than the disease of global warming"

Population and Food: Why India is Prospering Instead of Starving
Gajendra Singh



Climate Change and Human Development

Indicators for Climate Change and Global Welfare		Year		
Climate change	**Unit**	**1920**	**1999**	**2020**
Temperature	Degrees C	13,5	14,2	14,5
Water level	cm	0	24	30
Development of wealth and welfare				
Population	Billion	1,9	6,0	7,7
Infant mortality	Percentage of children under 5 years of age (from 1950)	22%	8%	4%
Life Expectancy	Years	35	66	72
Wealth	GDP/Cap USD (PPP, 2011)	2.000	9.000	16.000
Poverty	Percent below poverty line	70%	30%	10%
Education	Literacy	32%	80%	88%
Raw materials	Simons Abundancy Index (from 1980)	100	440	700
Energy	Percentage without access to electricity(from 1990)	30%	25%	10%
Yield farming	Wheat, tonnes/ha (from 1960)	1	2,8	3,5
Malnutrition	% malnutrition in the world (from 1950)	65%	15%	7%

The Minimal Impact Perspective

Food availability is rising:
Unimpacted by climate change

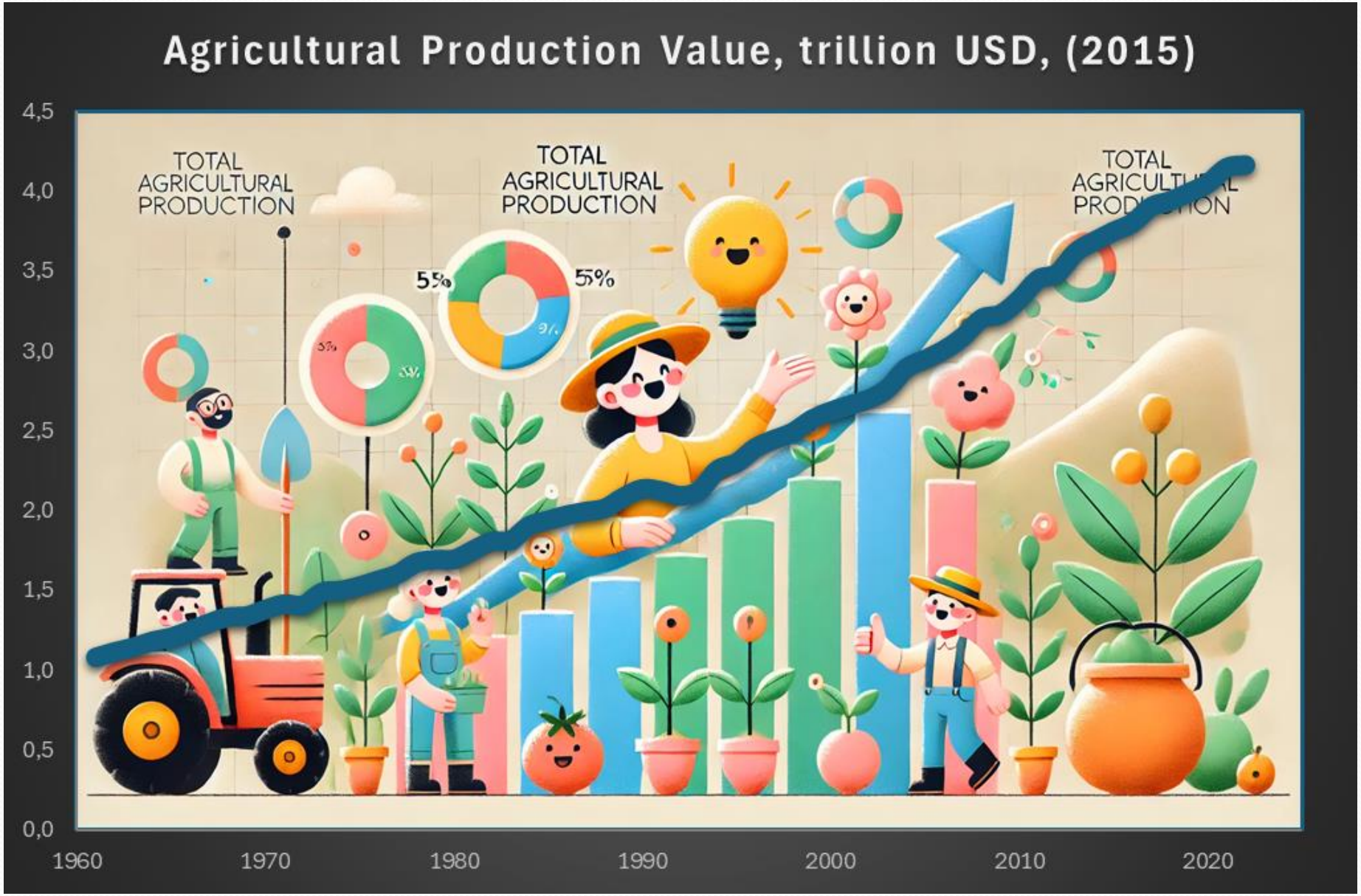
Primary Driver: Increasing demand for food due to population growth and rising wealth.

Efficiency and cost: Yields are rising and cost are falling caused by knowledde and technology

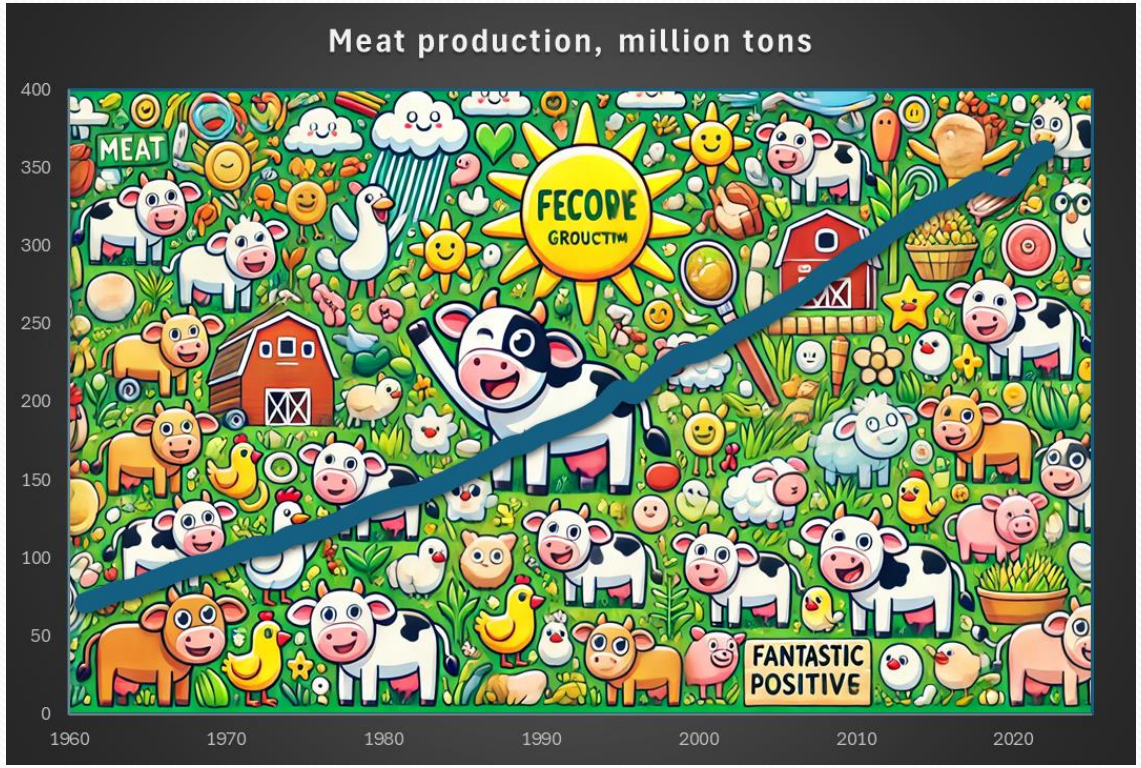
Climate Change Impact: Marginal compared to technology

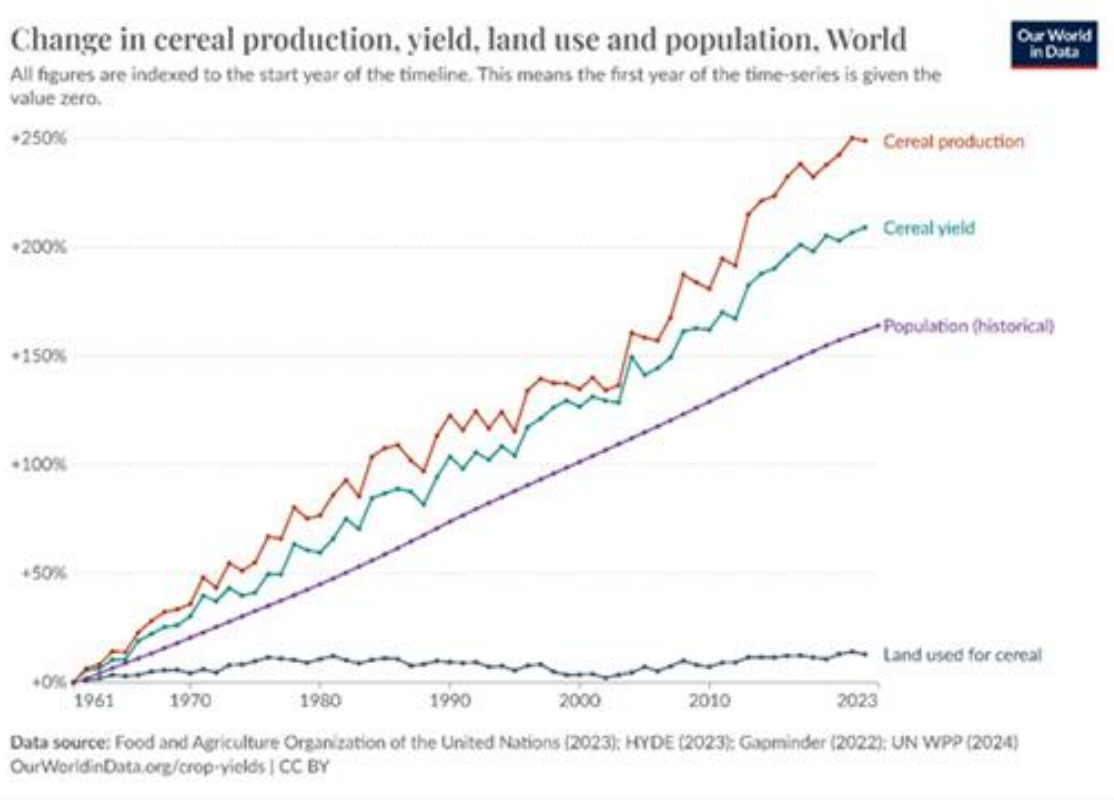
Future Food: Affordable high quality food, including meat, for all. With a steadily decreasing footprint

Global Food Production, the Big Picture

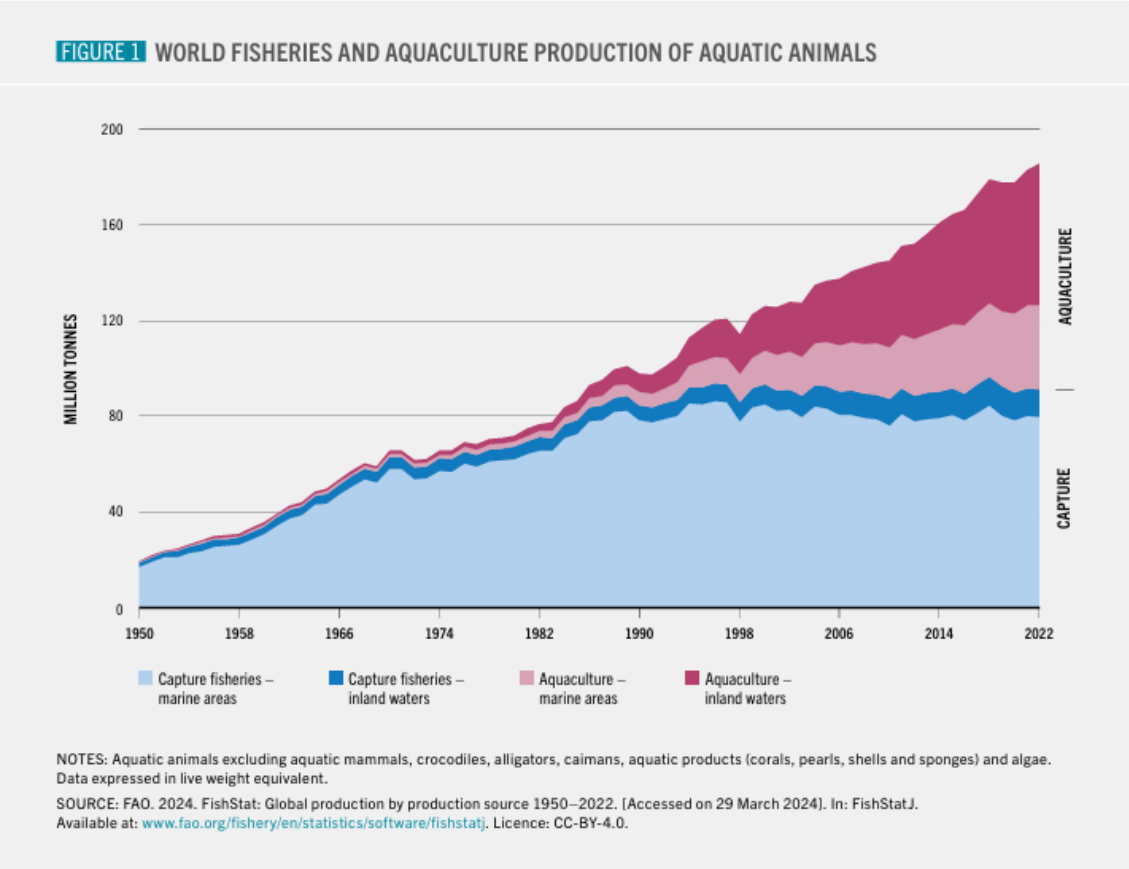


Production Quantities





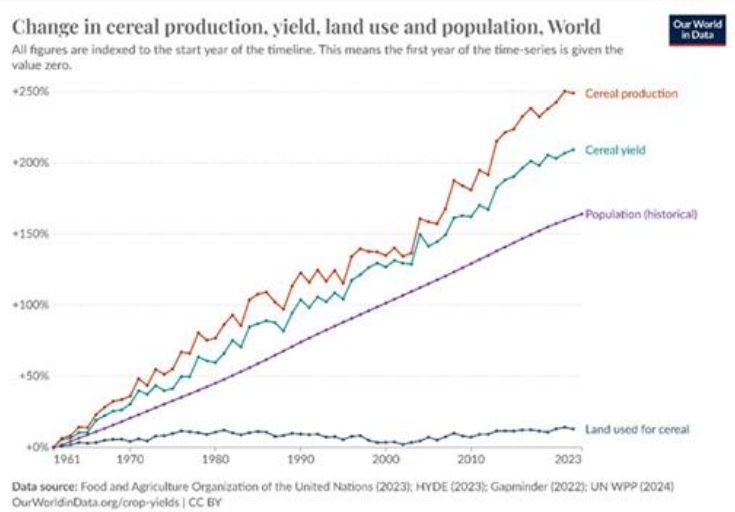
Fisheries & Aquaculture

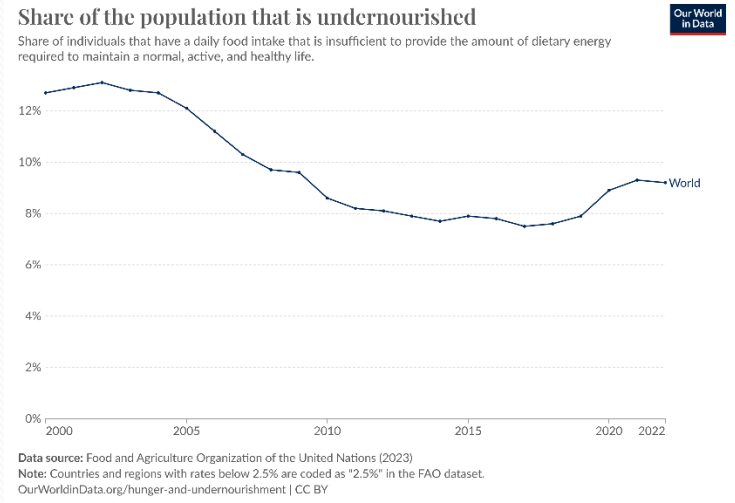


Total Value:	• 0.47 trillion
Fisheries	• 0.16 trillion
Aquaculture	• 0.31 trillion

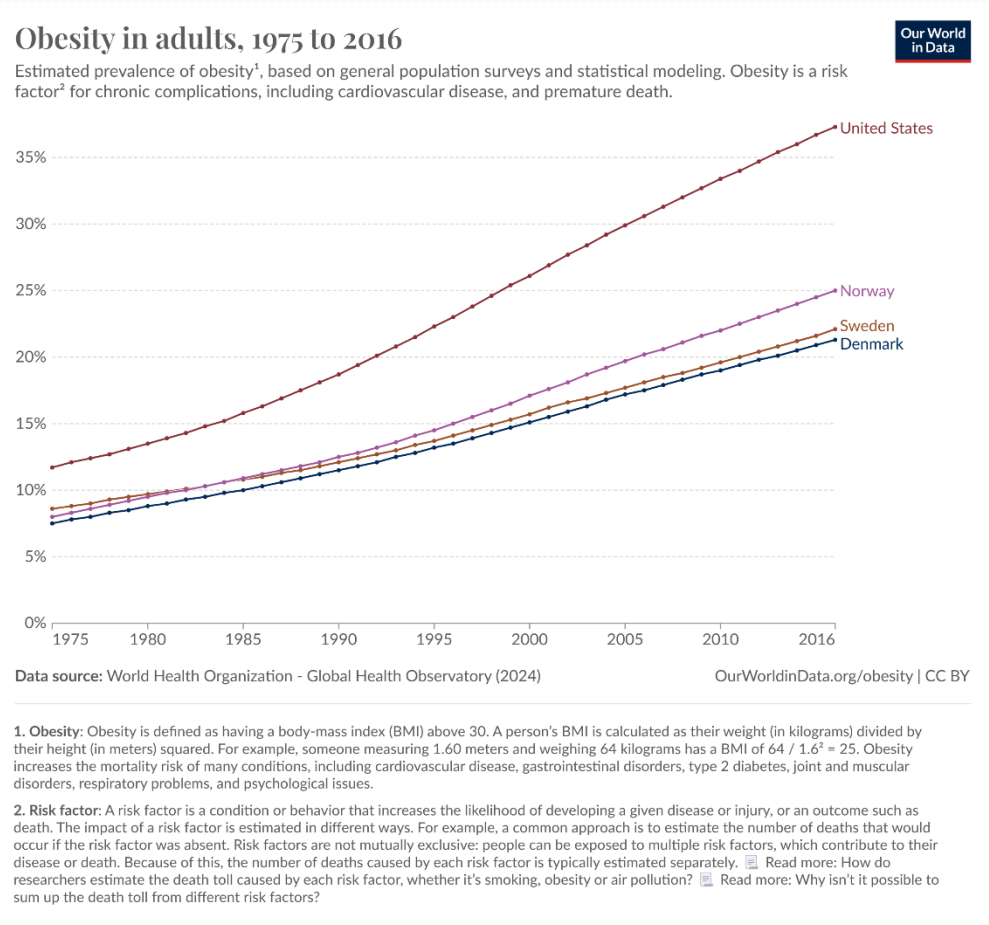
We Are Getting Well-Fed

- No excuse for hunger
  - *Findes der sult og nød, skyldes det svig, Nordahl Grieg*
- Endless Whining
  - The false prophets: From Malthus, via Ehrlich to Lester Brown: *Failed forecasts makes you rich and famous*
- The Real World
  - Tripling of food production since 1960
- Still nearly 800 mio. malnourished
  - Caused by bad governance





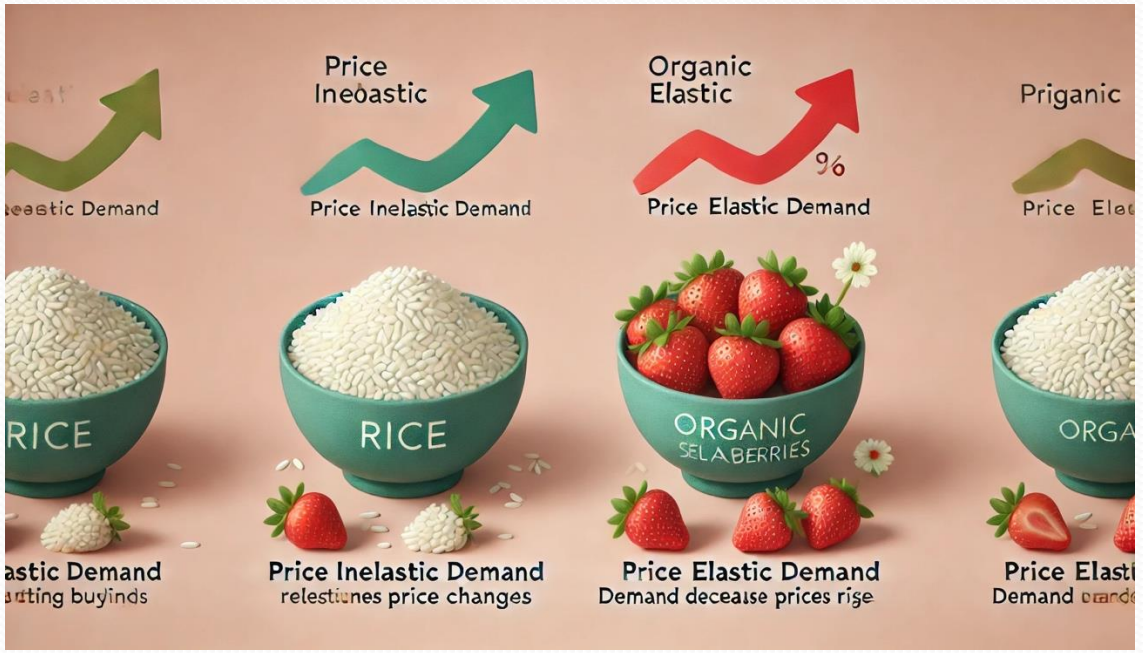
Obesity is Surpassing Malnutrition



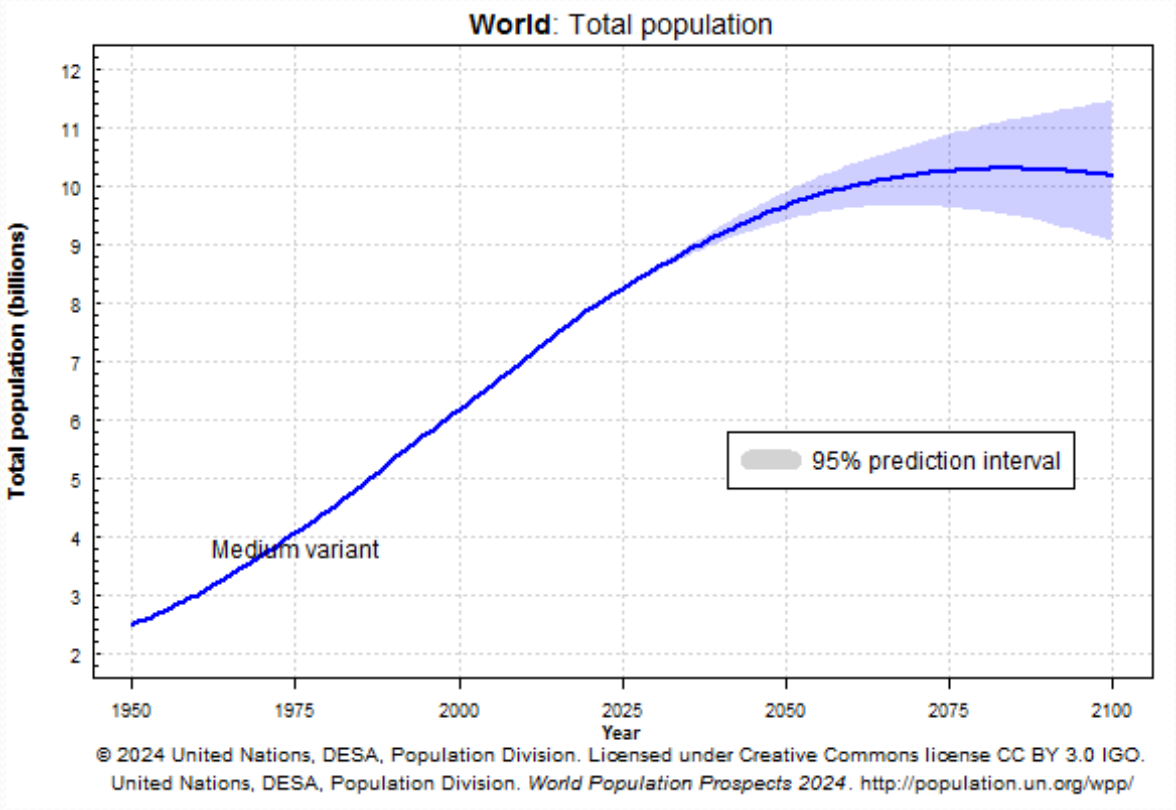
Staple Food is a Necessity

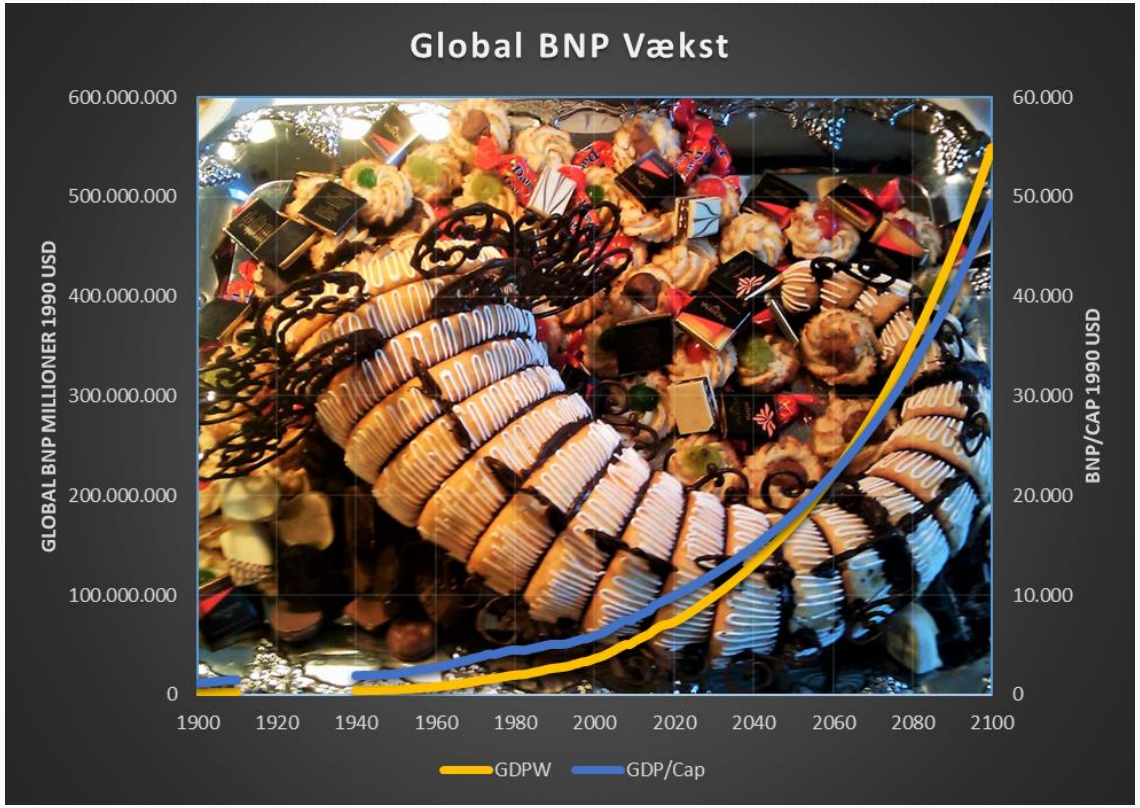
Rice etc. is price inelastic

Organic strawberries, not so much

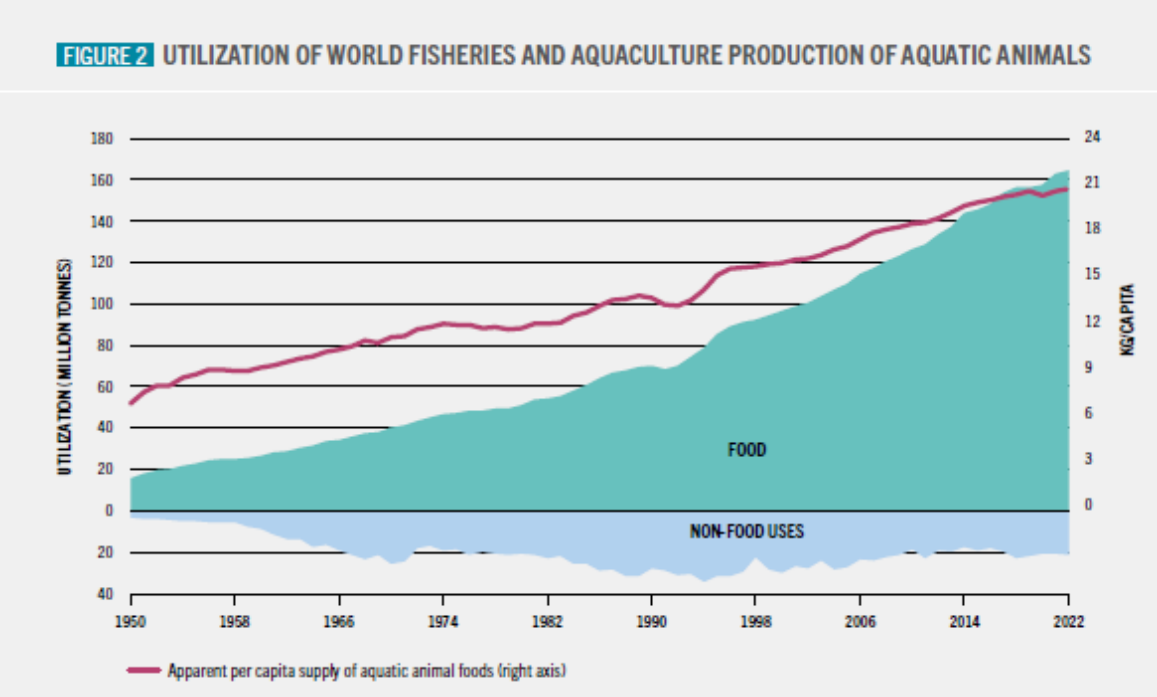


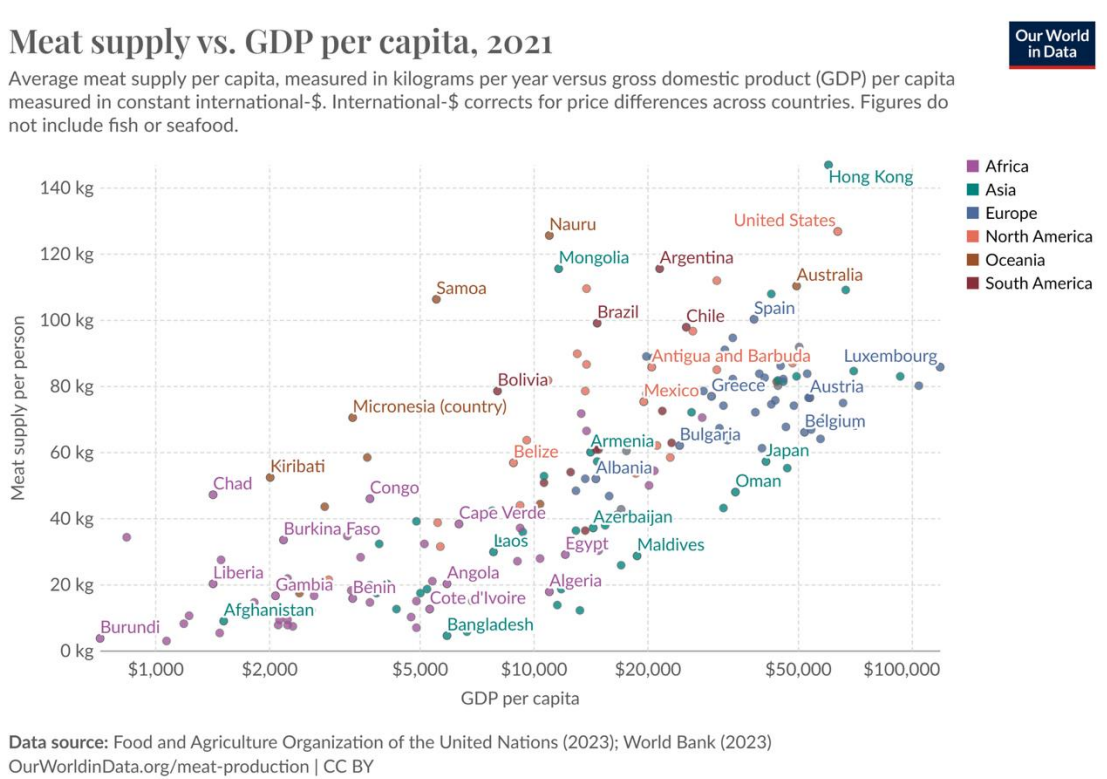
The Primary Driver is Demand



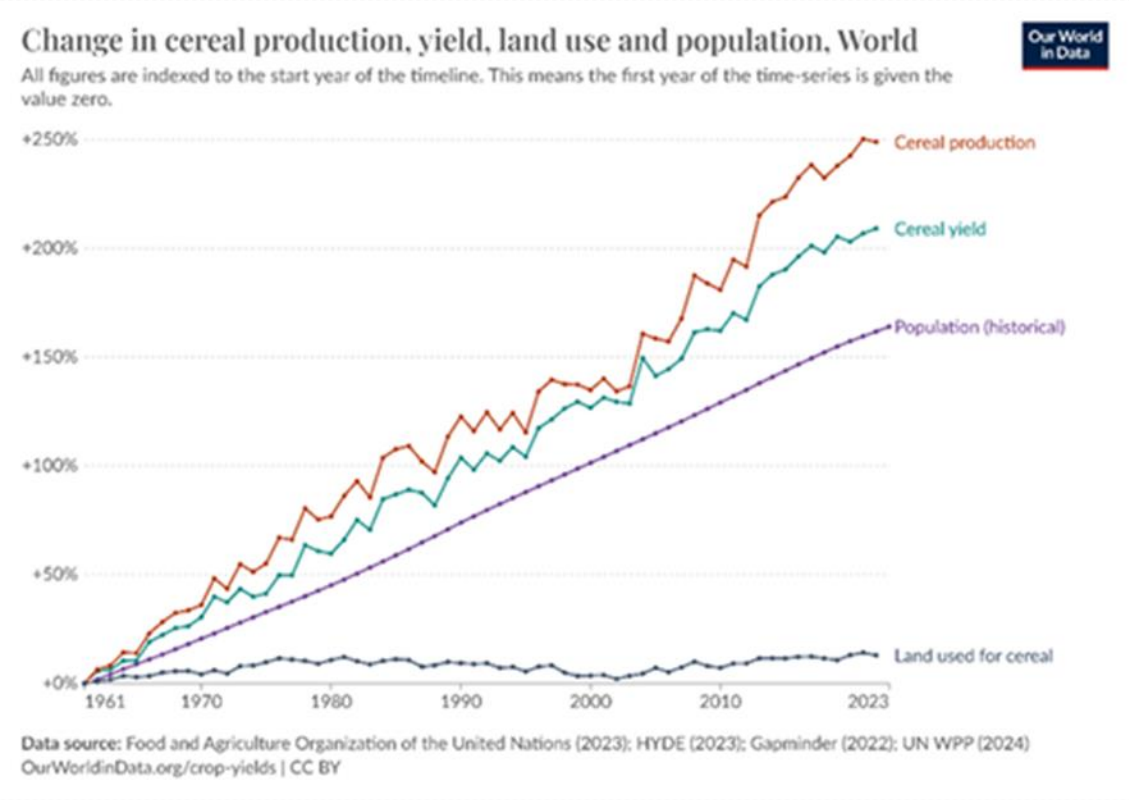


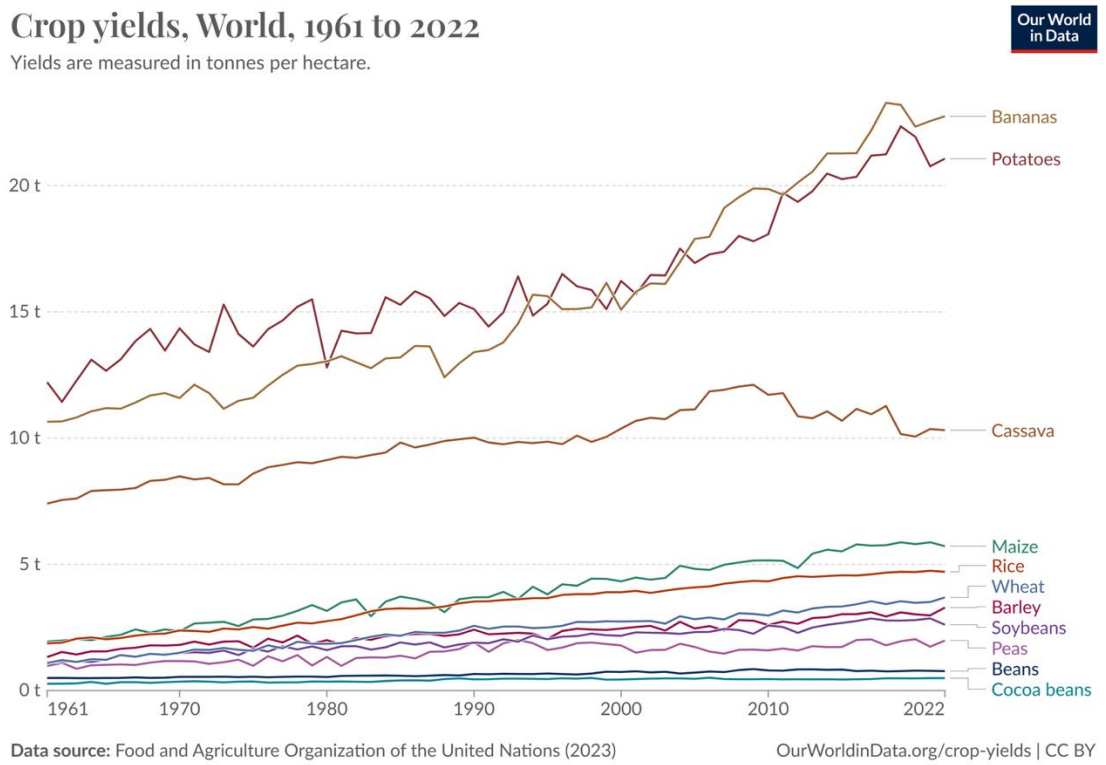
High Quality Food like Meat is in Demand



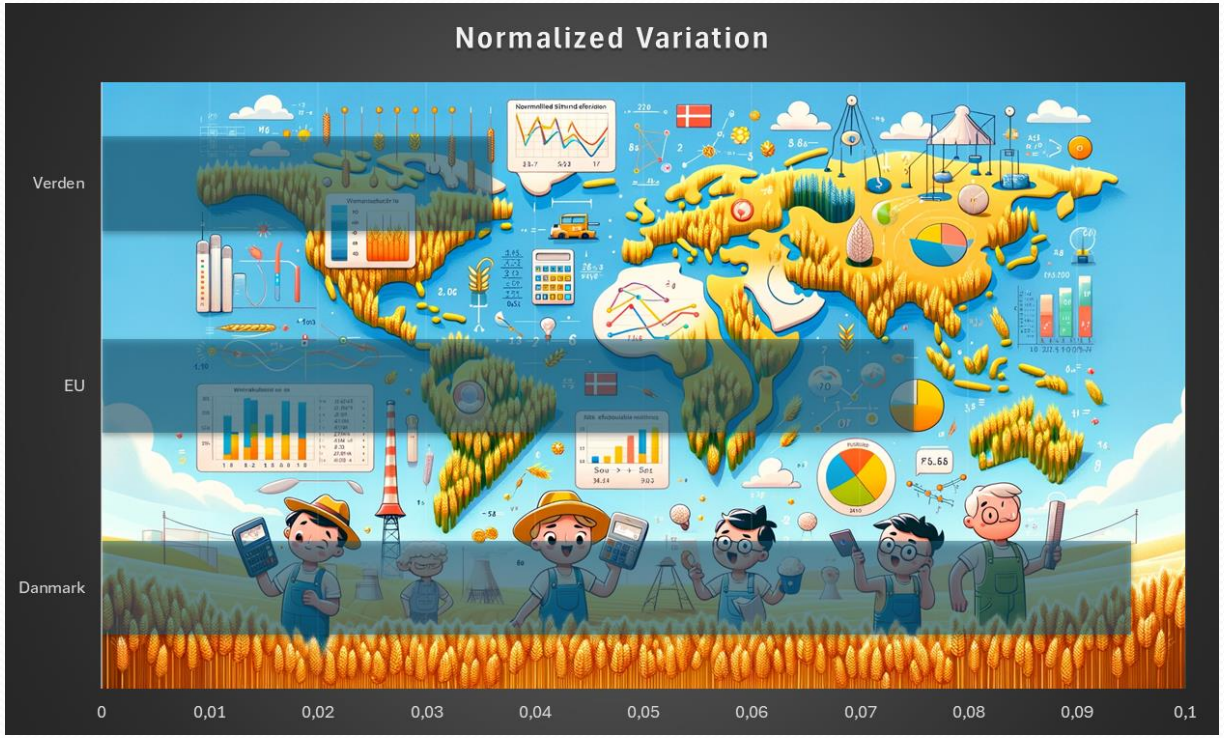


Increasing Efficiency & Decreasing Costs



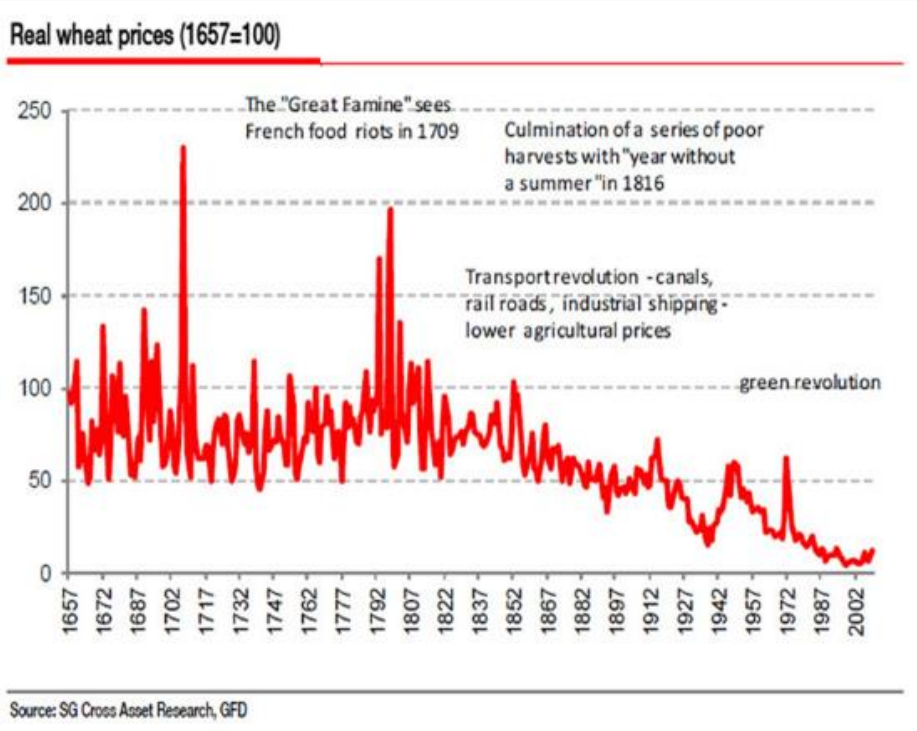


Wheat Yield, Denmark Compared



Globalization Enhances Food Security

Real Food Prices do not Increase



- The long-term trend is decreasing real prices

Man does much better than Nature

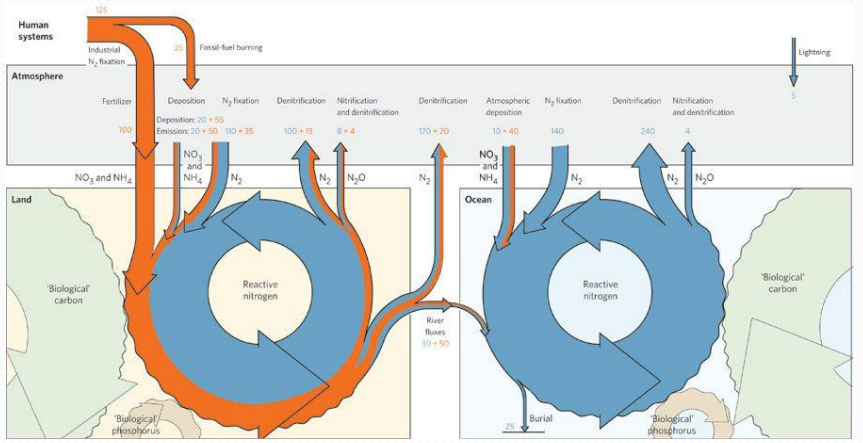
Appropriating Primary Production

- PP is not constant

Increasing N Cyclus

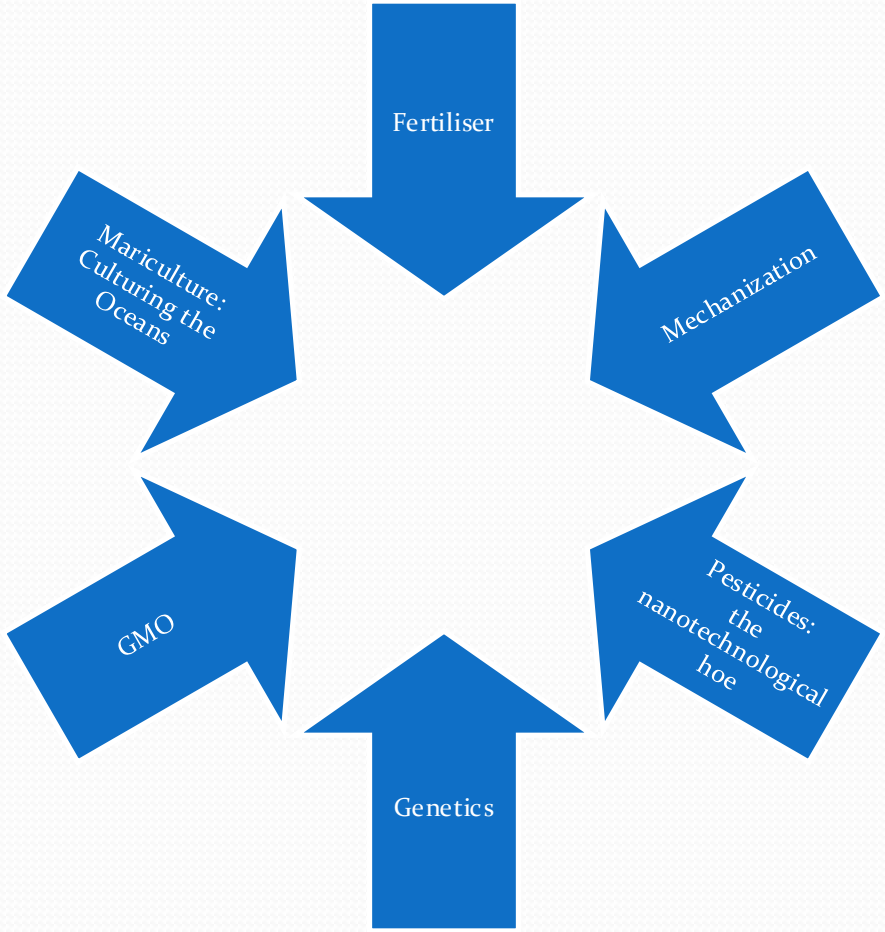
Yield

- < < 1 ton /ha: Slash-and-burn
- 1-2 ton/ha: Backbreaking labour
- 4 ton/ha: Global average
- 10 ton/ha: Modern farmer
- 30 ton/ha: Iowas best
- 100 ton/ha: GMO/Crispr/Seaweed
- >1.000 ton/ha: Lighted greenhouses

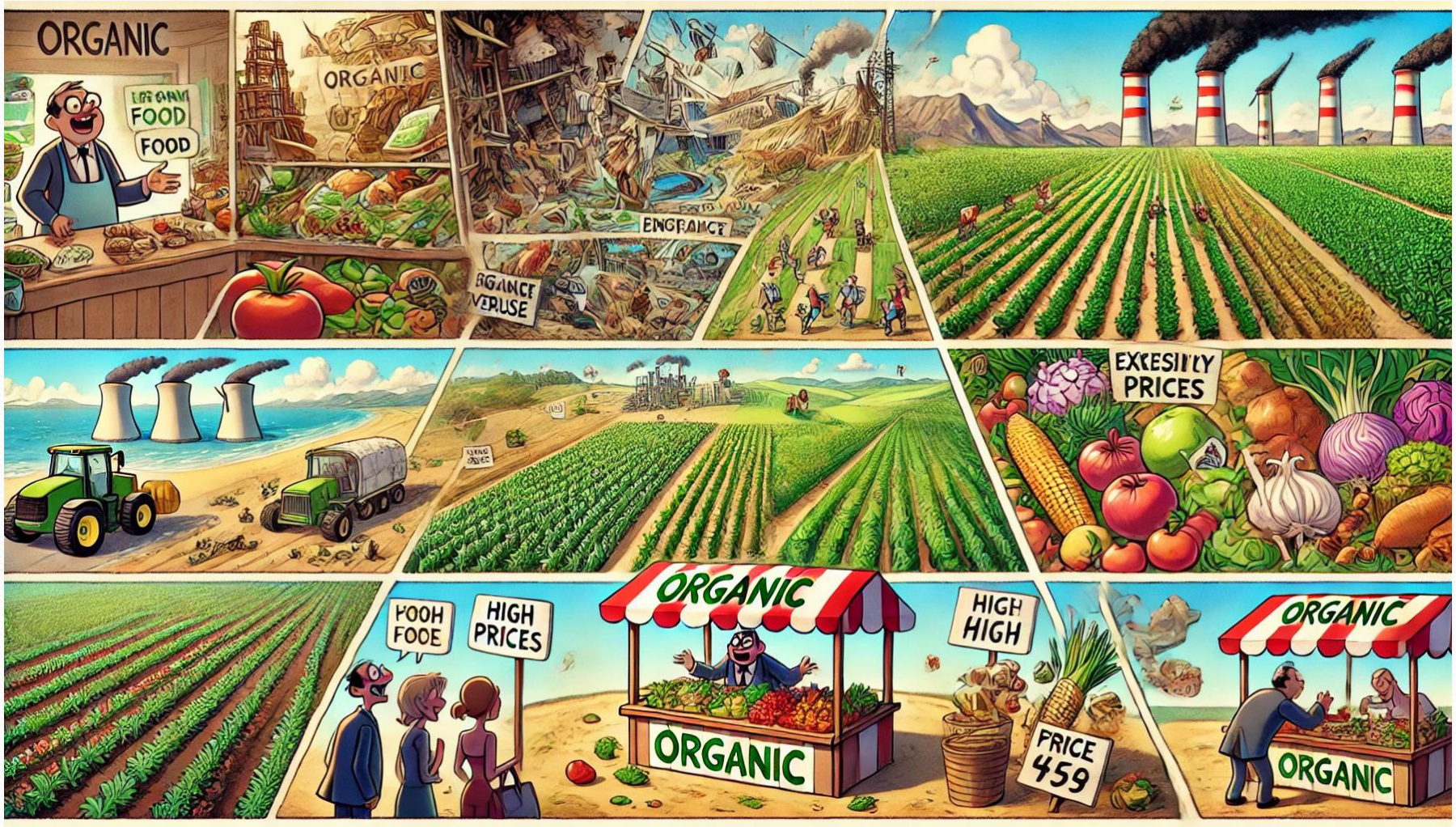



FOSSIL FUELS
ONE EXCEPTION,
POVERTY THE ROOT
ALL EVIL

Proven Food Production Technologies



Organic Farming is Harmful Retrotech

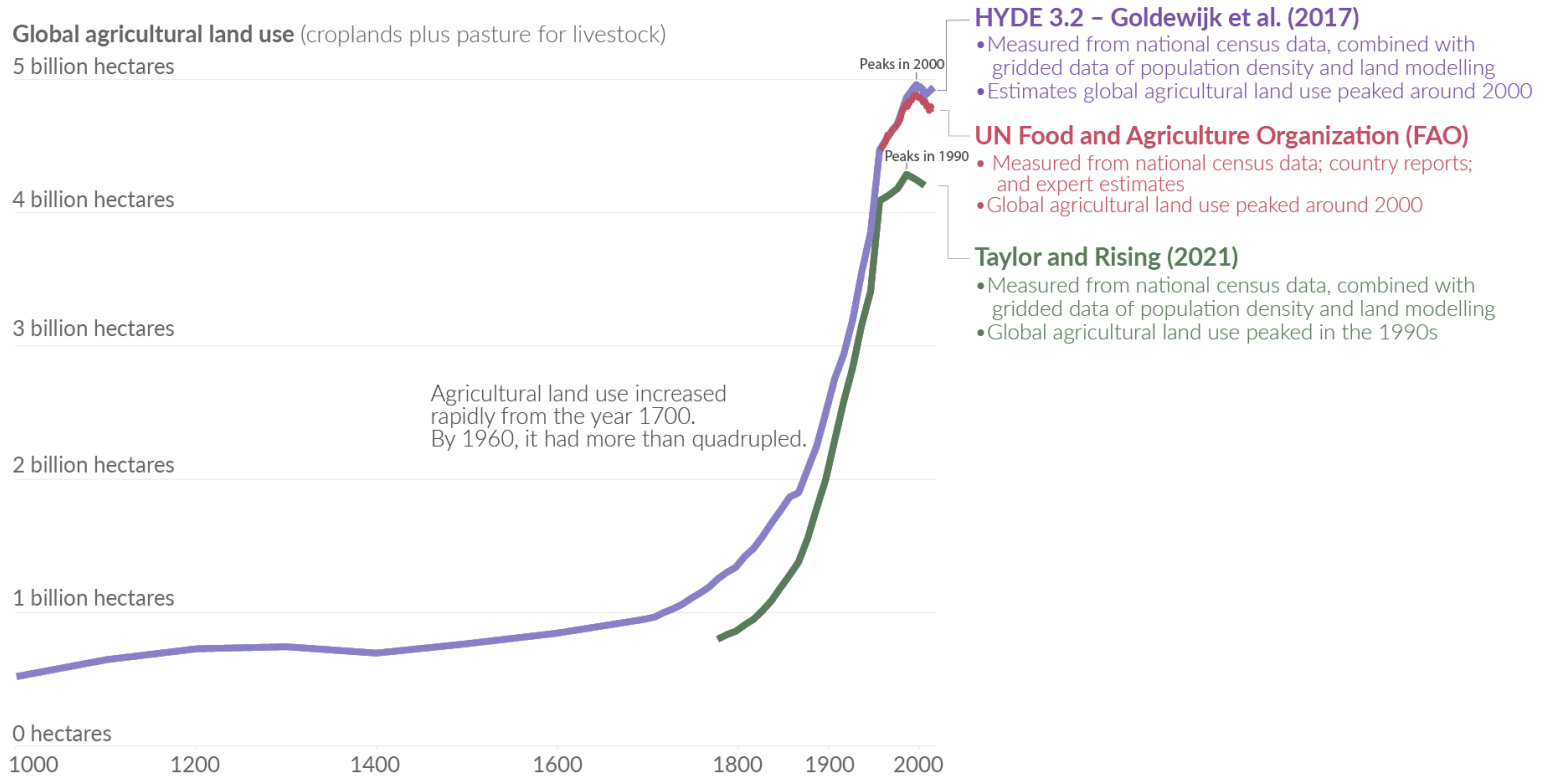


Peak Agricultural Land

The world has passed peak agricultural land

While sources disagree on how much land we use for agriculture, many suggest that the world has passed the peak. This is due to a reduction in global land used for pasture*. Global cropland use continues to increase.

Our World in Data



*A peak in global pasture land does not mean that it has peaked everywhere. In tropical regions, it continues to increase, often at the expense of carbon-rich habitats.

Sources: Goldewijk et al. (2017). Anthropogenic land use estimates for the Holocene – HYDE 3.2; Taylor and Rising (2021). Tipping point dynamics in global land use. Food and Agriculture Organization of the United Nations.

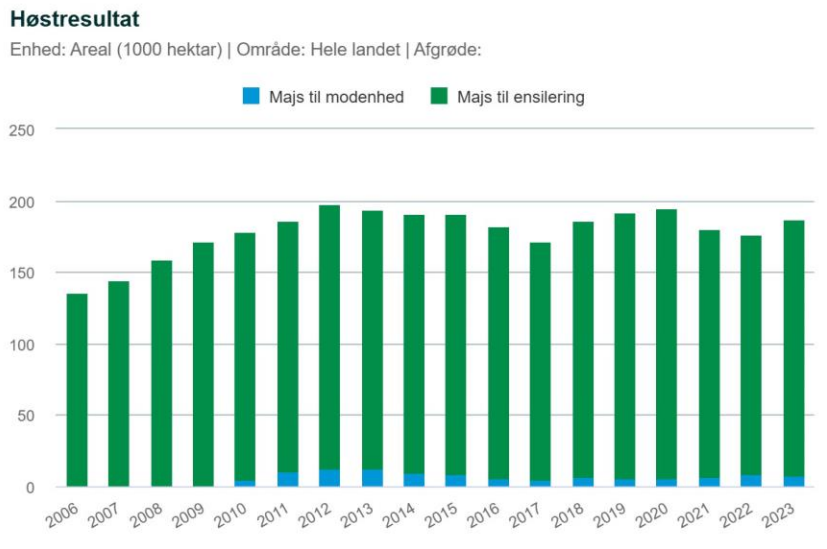
OurWorldinData.org – Research and data to make progress against the world's largest problems.

No sign of Climate Change on Global Food production

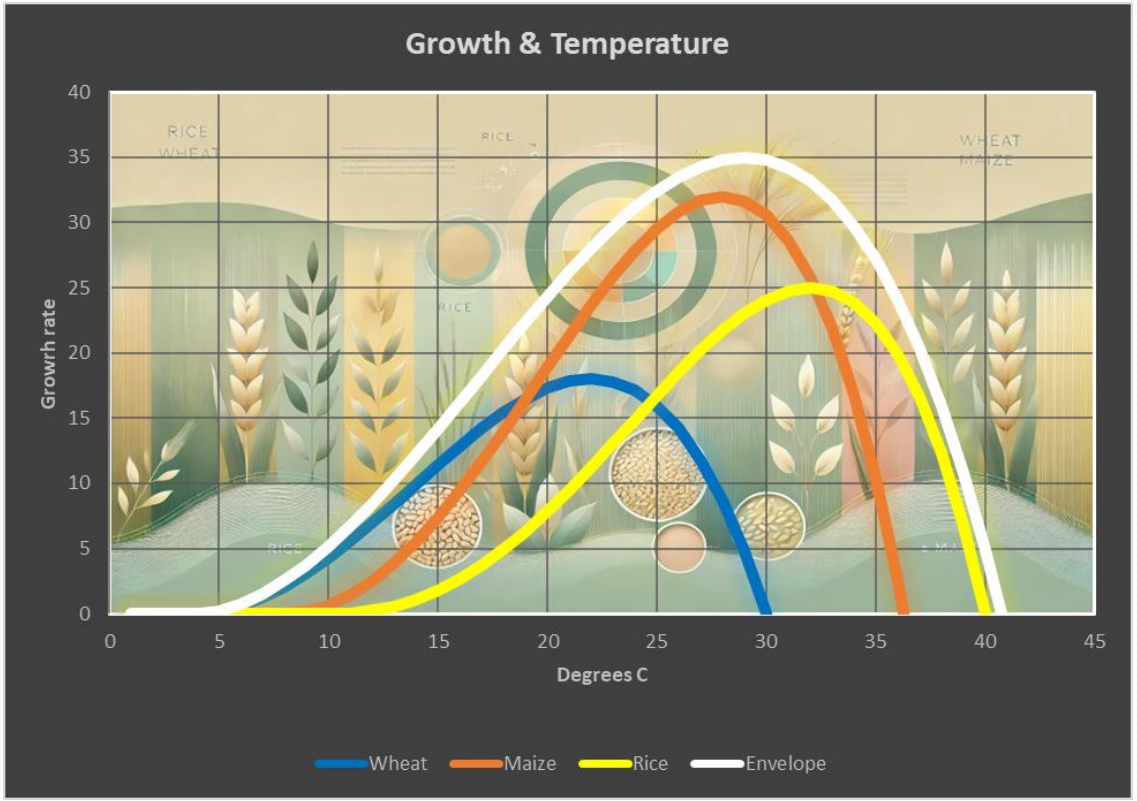
Follows demand, not weather	Global Supply Chain Locavoring is bad
Farmers Adapt	Researchers React
Huge capacity potential	
Maize in DK	

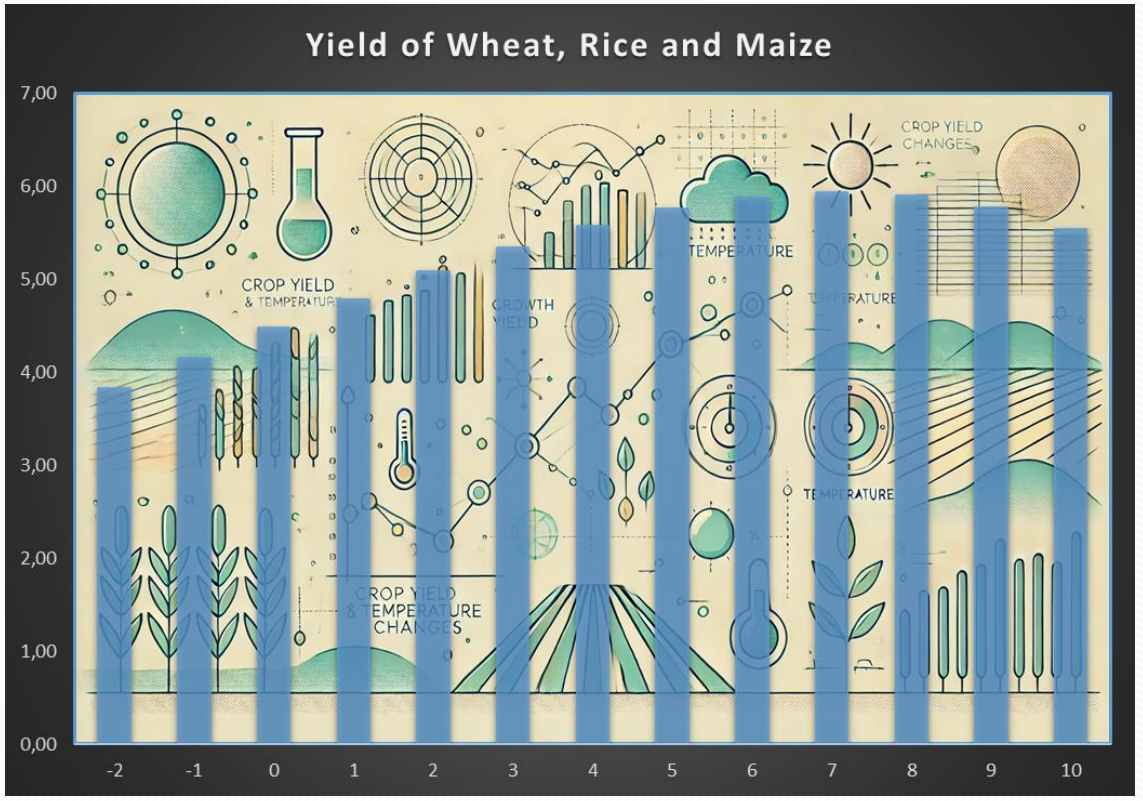
On what principle is it that with nothing but improvement behind us, we are to expect nothing but deterioration before us

Thomas Babington Macauley, mid 1800.



Expected Impacts, temperature





IPCC do not understand adaptation, McKitrick

Expected Impacts, Dry & Wet

Water is the primary production factor for plants

Drought is not increasing according to IPCC

Precipitation is increasing

Not Flooding though

CO2 Coalition

CO2 COALITION

Increased Crop Yield per Unit Area: Rising CO_2 levels have already increased crop production by 15-30% since 1900. Studies show that this effect will continue as CO_2 levels rise.

Improved Nutrient Use Efficiency: Plants can utilize soil nutrients more effectively under elevated CO_2 levels. This is particularly important in areas with nutrient-poor soils.

Increased Water Use Efficiency: Plants lose less water through transpiration at higher CO_2 levels. This means that crops can be grown with less water, which is crucial in areas with water scarcity.

Better Stress Resilience: Rising CO_2 levels can help plants withstand various stress factors, such as drought, ozone pollution, saline soils, and pests.

Diluting Nutrients. May well be right, but the total effect on protein production is still positive

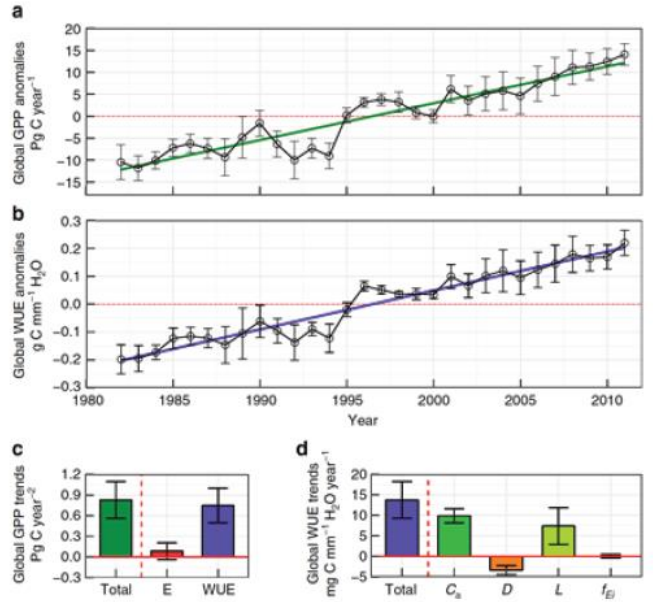


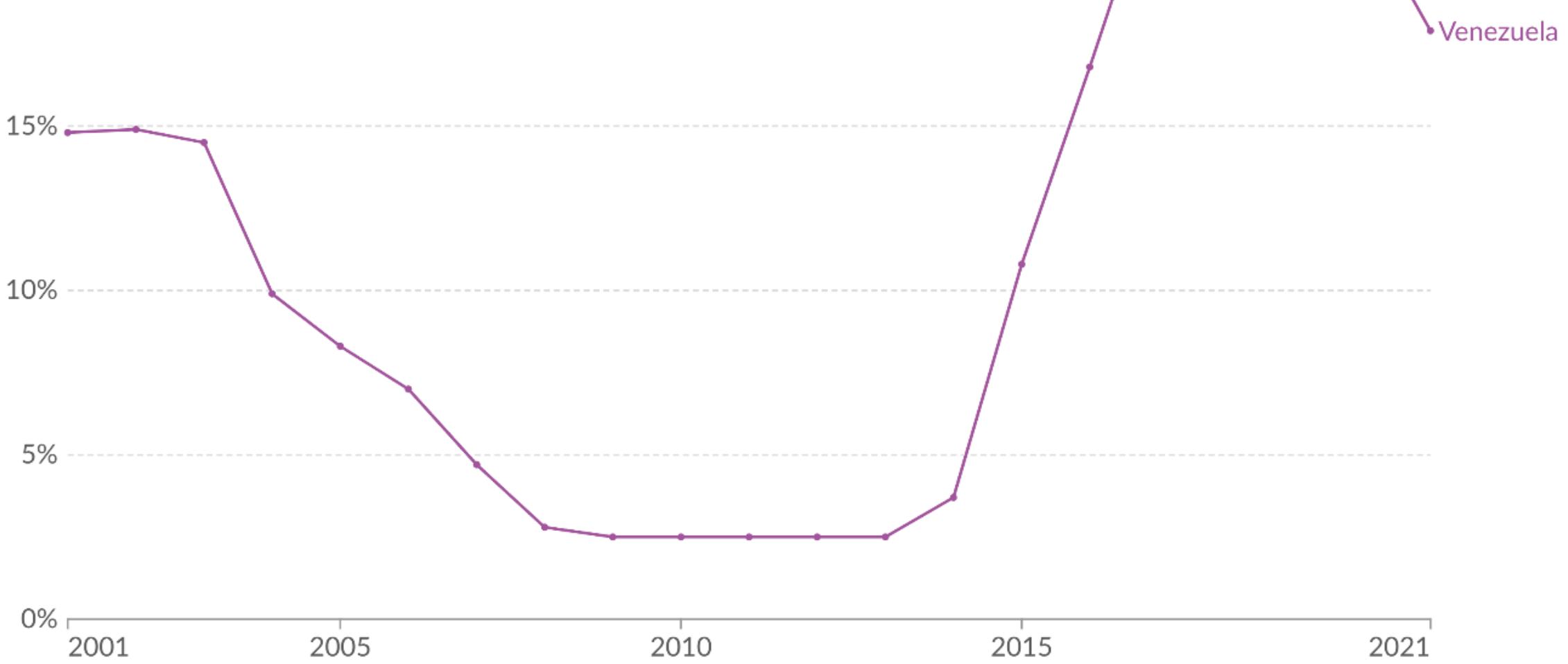
Figure 6. Estimated trends in global gross primary production (GPP) and water use efficiency (WUE) and their drivers over 1982-2011. Annual mean anomalies (with linear trend line) and associated standard deviations of (panel a) global GPP and (panel b) global WUE. (Panel c) Contribution of evapotranspiration (E) and WUE to total global trends in GPP (Total). (Panel d) Contributions of atmospheric CO_2 concentration (Ca), vapor pressure deficit (D), leaf area index (L) and fraction of canopy interception (fEi) to total ecosystem water use to the total increase in global WUE (Total). *Source: Cheng et al. (2017).*

Impact from Biofuels!

The great biofuels scandal

2013-12-17, The Telegraph

Last week, the EU missed an opportunity to end the most wasteful green programme of our time – one which costs billions of pounds annually and causes at least 30 million people to go hungry every year. By failing to agree a cap on the use of biofuels, the Council of Ministers has given tacit support for a technology that is bad for both taxpayer and environment. Legislation will now be delayed until 2015. The biofuel story is a perfect example of good intentions leading to terrible outcomes. Moreover, it is a lesson on how powerful, pseudo-green vested interests can sustain a bad policy. Hopefully, it will also be a story of how reason can prevail in the divisive climate debate.



Data source: Food and Agriculture Organization of the United Nations (2023)
Note: Countries and regions with rates below 2.5% are coded as "2.5%" in the FAO dataset.
OurWorldinData.org/hunger-and-undernourishment | CC BY

Swedish famine of 1867–1869

Very cold in 1867

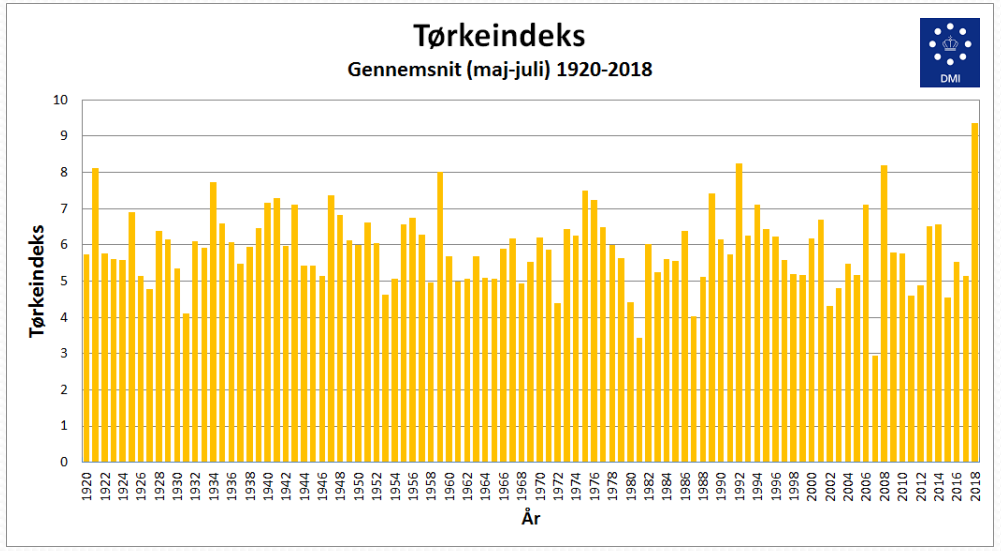
- 80-100.000 dead
- Emigration to US skyrocketed

1867

2018

The Drought i DK 2018

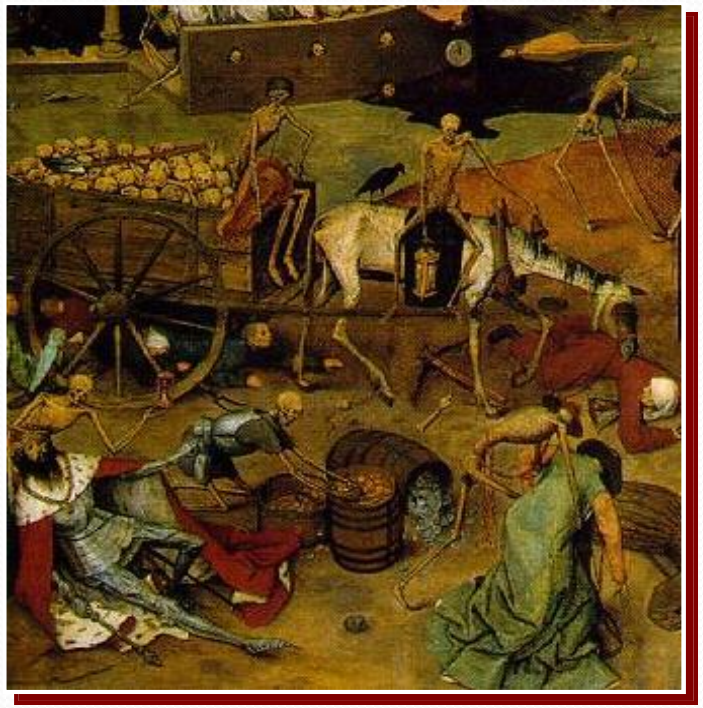
- 23 % less grain
- Economic Loss
- Nobody died



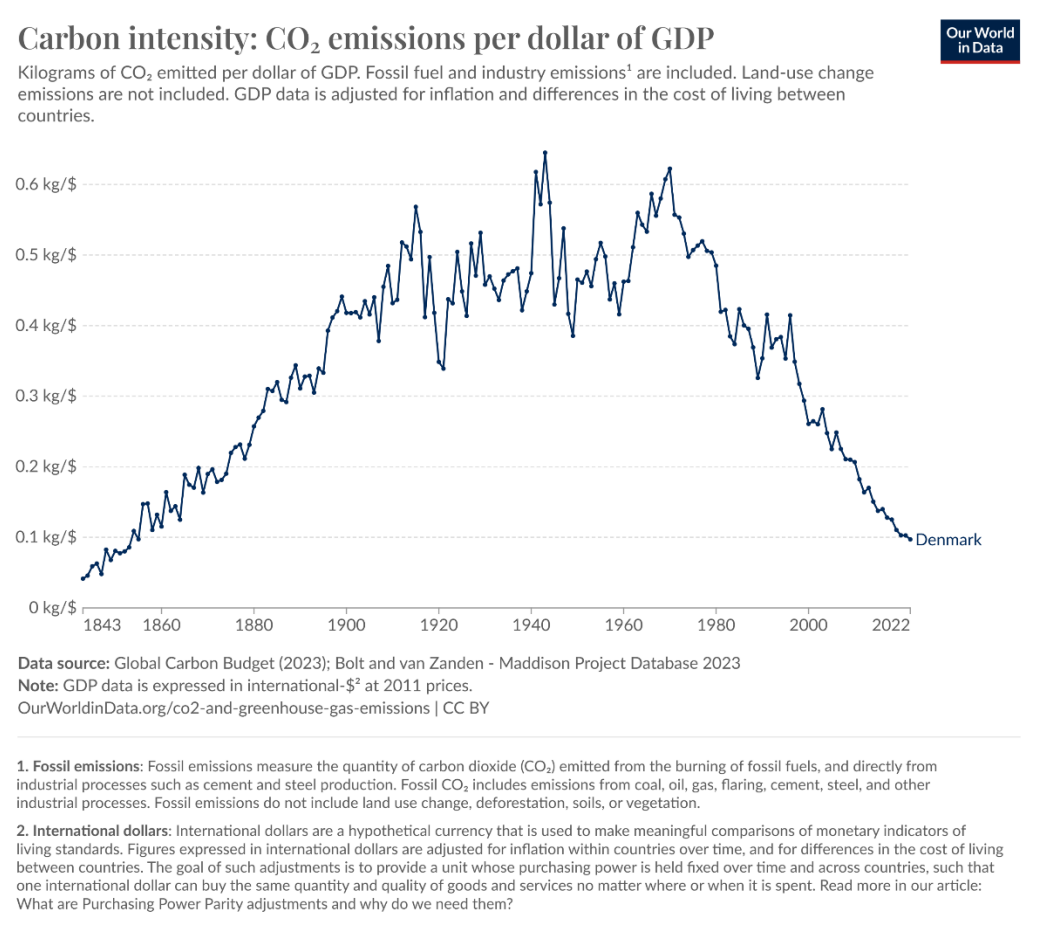
A Reservation Before the Conclusion

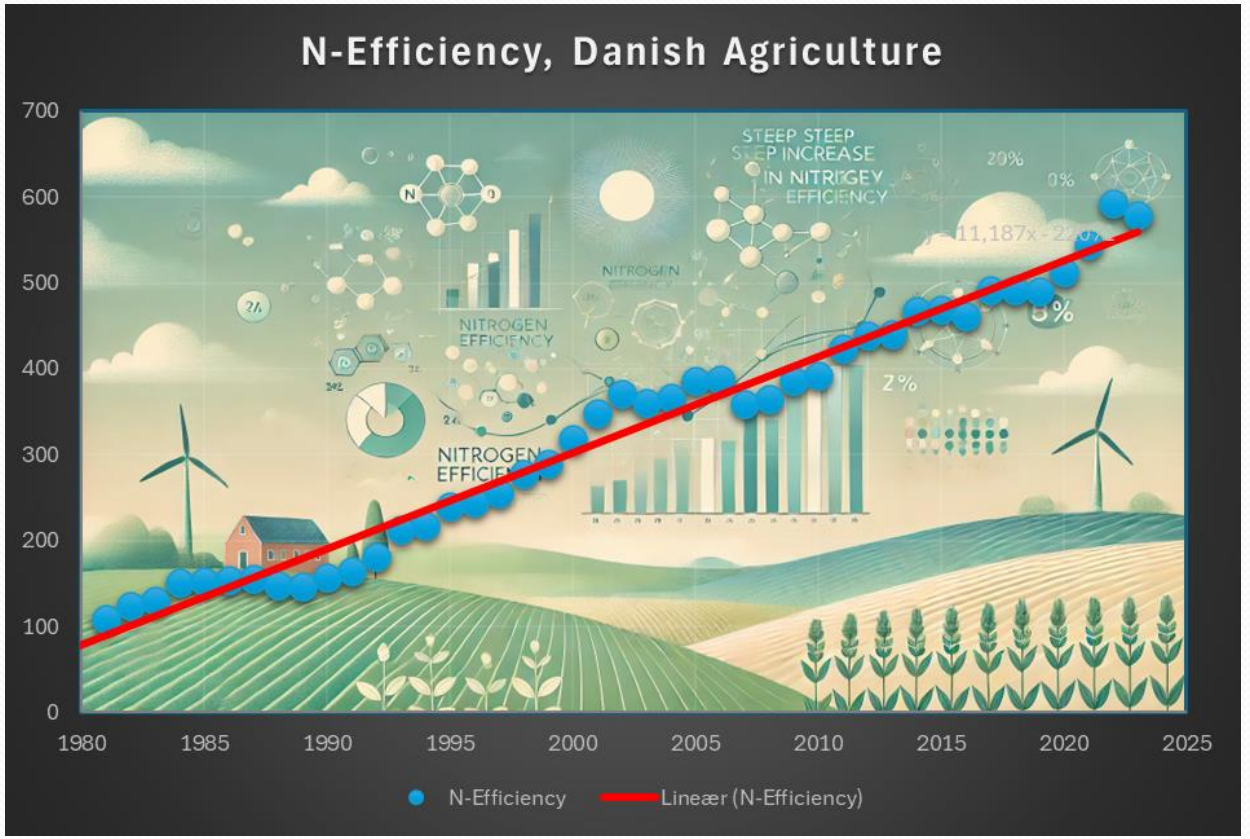
GEGEN DUMMHEIT KEMPFEN GÖTTER SELBST VERGEBEN:
JOHANN CHRISTIAN FRIEDRICH VON SCHILLER

PERFECTION IS NOT NECESSARY



Food Future:
Affordable Food for All with a Low Impact





Decoupling is the way to go

Future Food Production Technologies

- Ocean Farming
- Precision Agriculture
- Animal Cell Culture
- Food Production in Space
- Food Towers

Potential of the Oceans for Food production

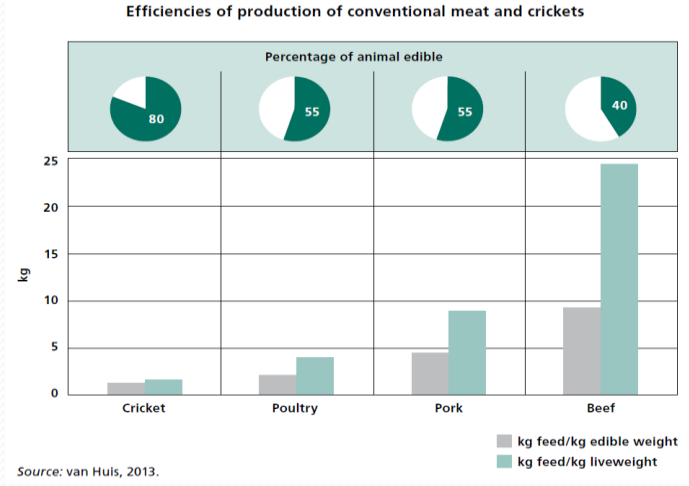
- In practical terms: Unlimited Space
- Unlimited Water
  - Water is major limiting factor on land
- Ample supply of nutrients
  - Artificial upwelling
- Small variations in salinity & temperature
- Ocean Currents – Rivers of the Sea

The Insect Eating Craze

Fish & Insects have more or less the same Food Conversion

Fish are much more in Demand and valuable

What do you prefer?



8 Precision Agriculture Trends in 2025

Precision Agriculture

- Satellite Technology
  - 701x
  - SENSEFARMING
- Internet Of Things
  - AGRILA
  - esi eco-smart irrigation
- Artificial Intelligence
  - SWAY AI
  - mojow
- Variable Rate Technology
  - LEAPBOX
  - GeoPard Agriculture
- Agricultural Robotics
  - TRABTYX
  - AuRosRobotics
- Drones
  - AnTPod
  - X-ENDER
- Big Data & Analytics
  - palmear
  - VAIS
- Emission Reduction Technology
  - SMART CLOUD FARMING
  - Downforce TECHNOLOGIES

589

Startups & emerging companies analyzed

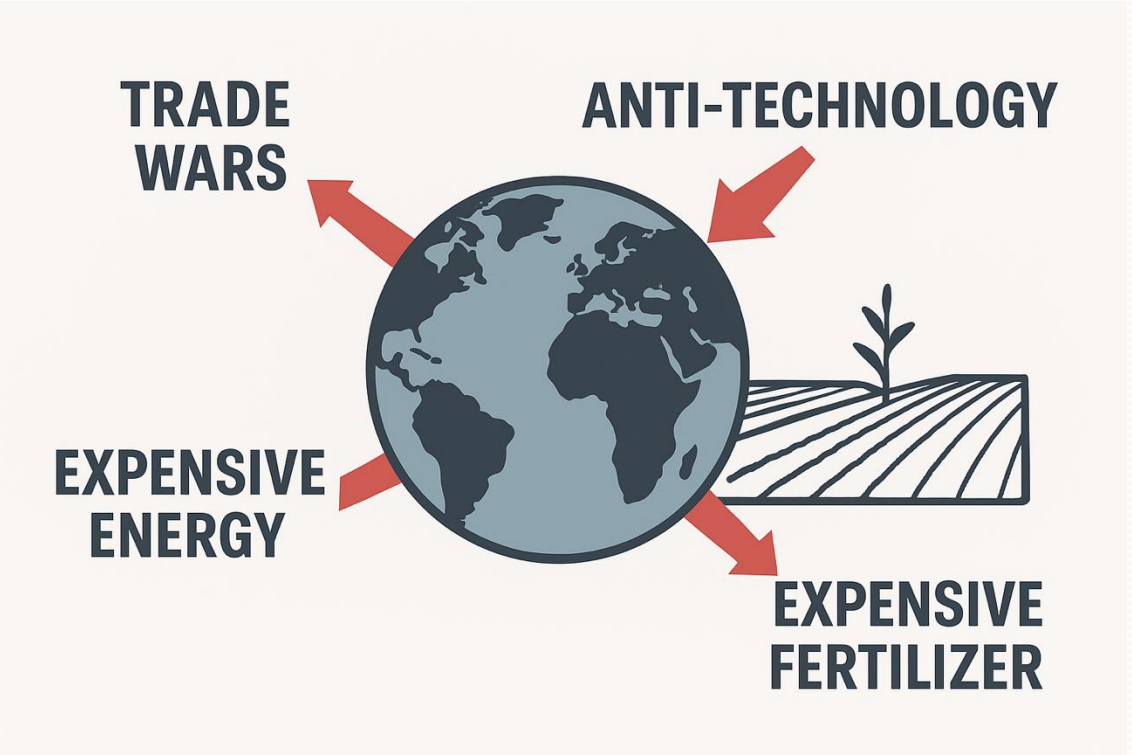
Pigs in Space


Fish & Beef Filets ad Infinitum


Nuclear Powered Food Towers

Discussion: Real Threats for Food Production

- Expensive Energy & Fertilizers
- Anti-GMO….
- Trade restrictions



A Sane World Will Never Run out of Food

Unlimited production capacity on land & and in the sea

Climate Change will be a minor factor

Can move production to other places

Increase price a bit

CO_2 is beneficial

All impacts of farming will steadily decrease


The Lady Gets
the Last Word

Wine, Dine and Enjoy Life