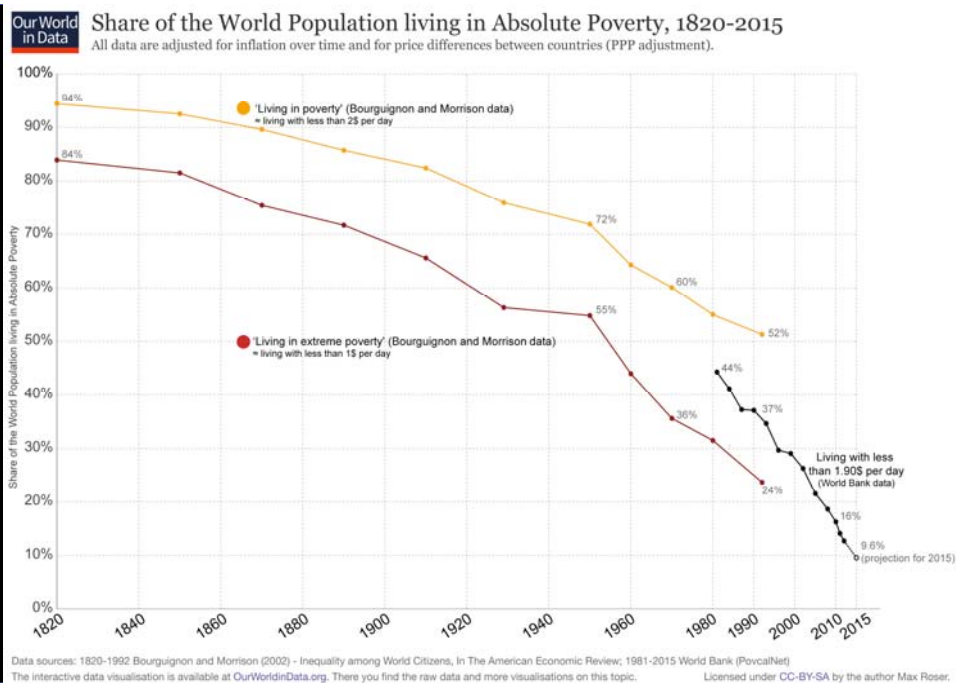


Grains & Ethanol: The Next 10 Years

Kansas State University Risk & Profit Conference
Manhattan, KS
19 August 2021

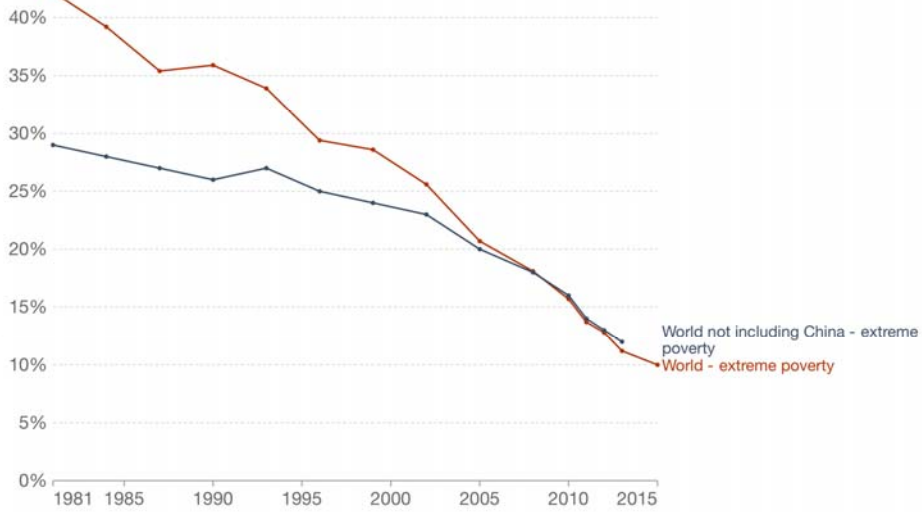
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Share of global population living in extreme poverty including and excluding China, 1981 to 2015

Our World in Data

Living in extreme poverty is defined as living below the international poverty line at 1.90 international-\$ per day.



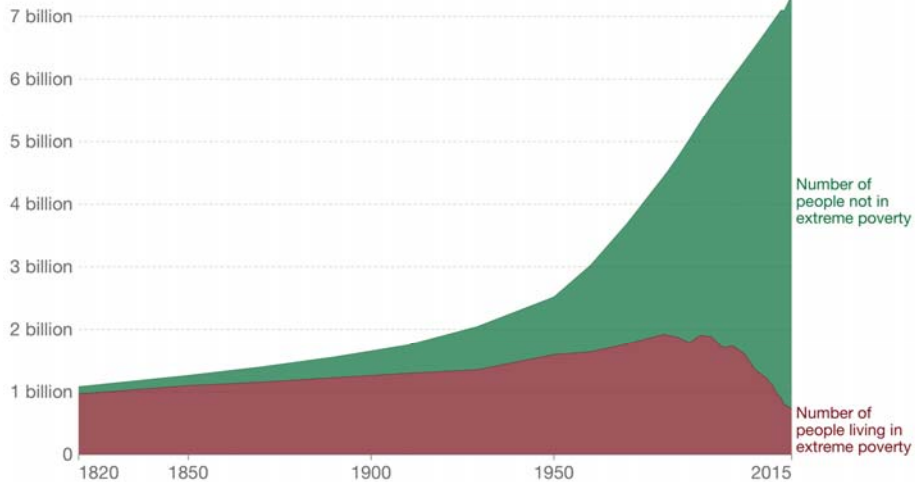
Source: China share of World Poverty - World Bank (WDI) (2017), World Bank

OurWorldInData.org/extreme-poverty/ • CC BY

World population living in extreme poverty, World, 1820 to 2015

Our World in Data

Extreme poverty is defined as living on less than 1.90 international-\$ per day. International-\$ are adjusted for price differences between countries and for price changes over time (inflation).



Source: Ravallion (2016) updated with World Bank (2019)

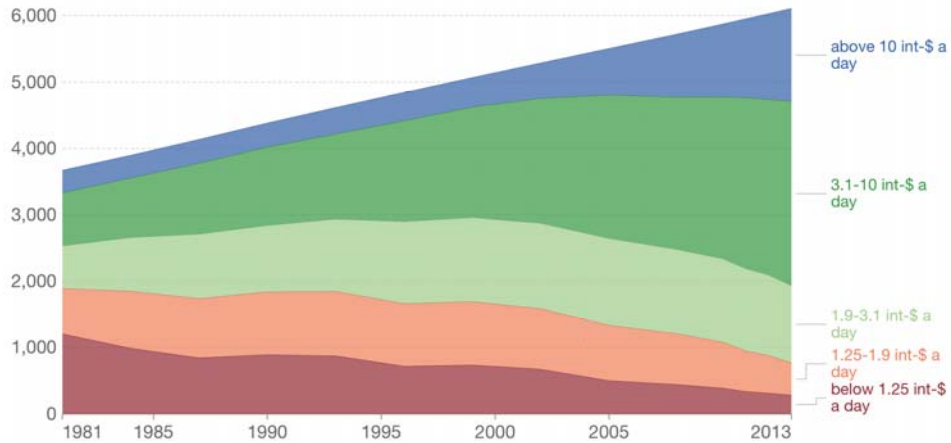
Note: See OurWorldInData.org/extreme-history-methods for the strengths and limitations of this data and how historians arrive at these estimates.

OurWorldInData.org/extreme-poverty/ • CC BY

Population in non-rich countries by per capita household income, 1981 to 2013

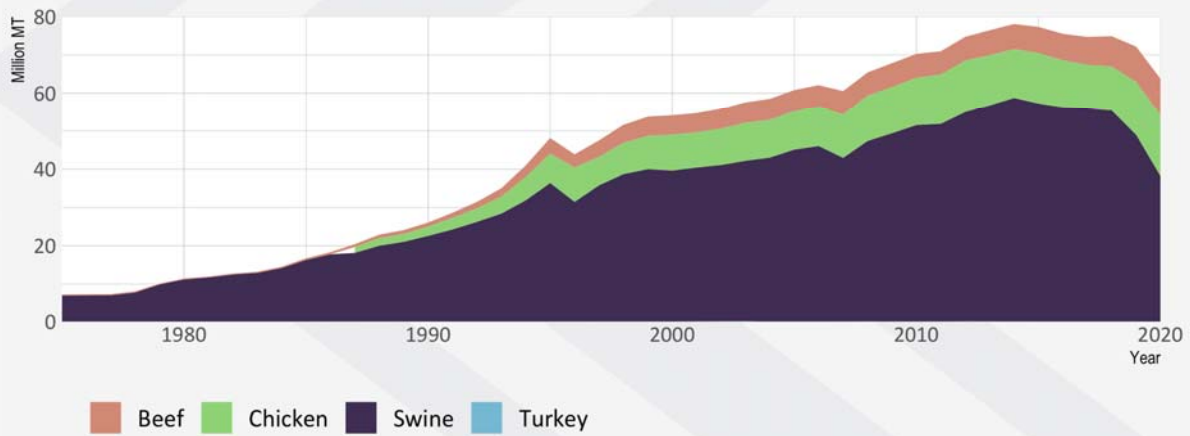
Our World
in Data

Income brackets are in international dollars, so they account for cross-country differences in prices levels, as well as for inflation over time. The group of 'non-rich' countries includes all countries in the world except those listed in the footnote. Figures correspond to numbers of people in millions.



Source: Poverty and consumption groups in developing countries - PovcalNet March2017 OurWorldInData.org/extreme-poverty/ • CC BY
 Note: 'Non-rich' countries are all countries in the world except: Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

Chinese Meat Consumption 1975-present



allmeat-ch-consumption Source:USDA PSD

Animals farmed
China

A 12-storey pig farm: has China found the way to tackle animal disease?

Animals Farmed is supported by



About this content

Michael Standaert and
Francesco De Augustinis

Fri 18 Sep 2020 03:30 EDT

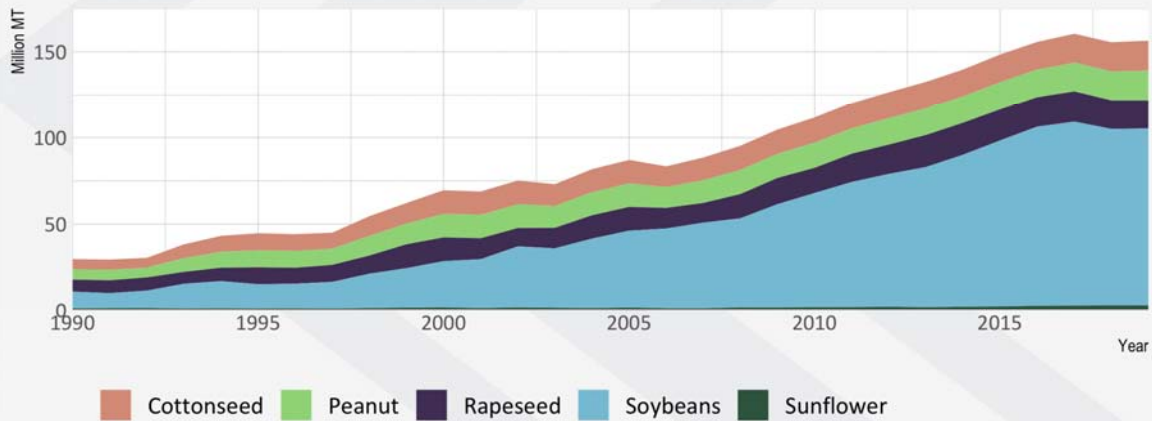


3,473



Yangjiang's high-rise pig buildings at Yaj mountain. Photograph: Reuters

Chinese Oilseed Consumption 1975-present



Land is the Ultimate Resource in Agriculture:

- Chinese Soybean Imports in 2020/21 were 3.6bn bushels, or ~72m acres
 - In 2001, only 600m bu, or ~15m acres
- US Ethanol consumption is 5bn bu,
 - net of DGS, about 3.4bn bu., or ~22m acres (now, 20m...)
 - In 2002, ethanol used 500m bu, or ~2m acres
- ***A total of 77m acres of additional land to meet the #1 and #2 sources of demand.***
- This ignores Chinese meal & feed grain demand, Korea, Mexico, Japan, Brazilian domestic demand, etc.

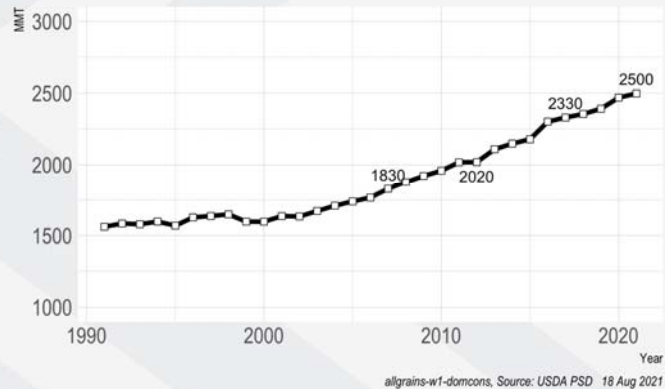
KMG Rule of Business: The owner of the scarcest resource accrues the wealth.

- What is the moat of your industry?
- Crops
- Cow Calf
- Dairy



Sources of Future Demand Growth

- Food demand
 - Rich world
 - Developing world
- Fuel demand
 - US
 - International



Global Population Growth is Slowing

- Wealth & education does that
- Very difficult to increase
- COVID might further slow...
- Not 10bn by 2050
- Food demand is just as much about better than more...
 - Wealth*population has been growing faster

What about meat substitutes?



What about meat substitutes?

- Cultured Meat
 - Feed conversion ratio roughly of chicken
 - Not yet made from non-medical grade ingredients
- Plant-based
 - Impossible burger
 - Where is the growth?

To the extent that the world can continue its post WWII trend...



- Trade
- Peace
- Growth
- The coming decades **are** the decades of agriculture

What about Ethanol?

- Ethanol consumes ~1/3 of US corn. (30m ac)
- ~1/2 Brazil's sugar (10m acres)



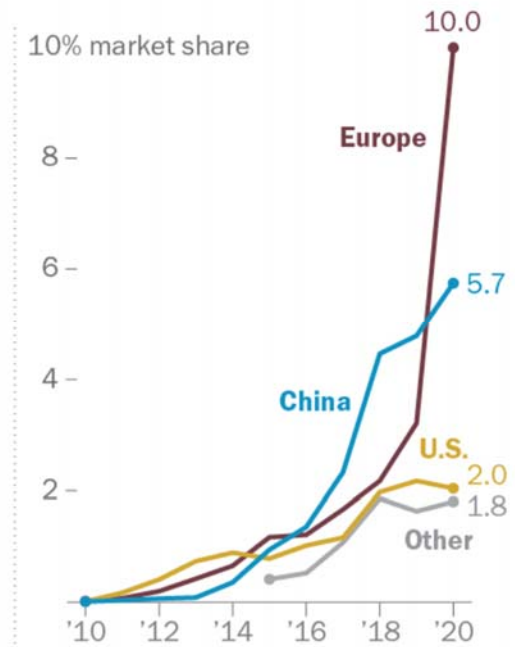
What are the threats?

- Electric vehicles
- Regulatory change/RFS in the US
- Global regulatory changes



Electric Vehicles

- EV/HEVs are 2% of sales
- 0.5% of US fleet
- 7% of US adults own one

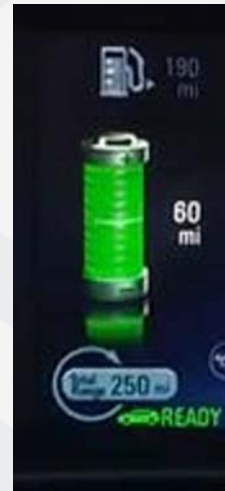


Fathers & Sons...



We will continue to see PH/EV share grow.

- There are some benefits
- CAFÉ levels cannot be set by EO
- America is BIG
- Battery chemistry is still young
- Batteries are expensive.



What is the path forward?

- RFS will be reopened.
- How to proceed?

E85 vs 87: 2.27 vs 2.77 or 19%

E85 vs 93: 2.27 vs 3.37 or 33%



Internationally...

- Advances made in biofuel and crop production have quieted opposition to mandates.
- The political future in most of the world is no worse or even better than the US.
- Carbon regulation is a double-edged sword.
- US is largest producer and consumer of Ethanol.

Summary

- The 21st century will be a century of agriculture
- Sustainability
- Technology
- Demand

Questions?

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