Climate change, Crisis or Opportunity?

Prof Guy F Midgley
Stellenbosch University, South Africa

Origins
Adaptation
Slowdown
Dissonance

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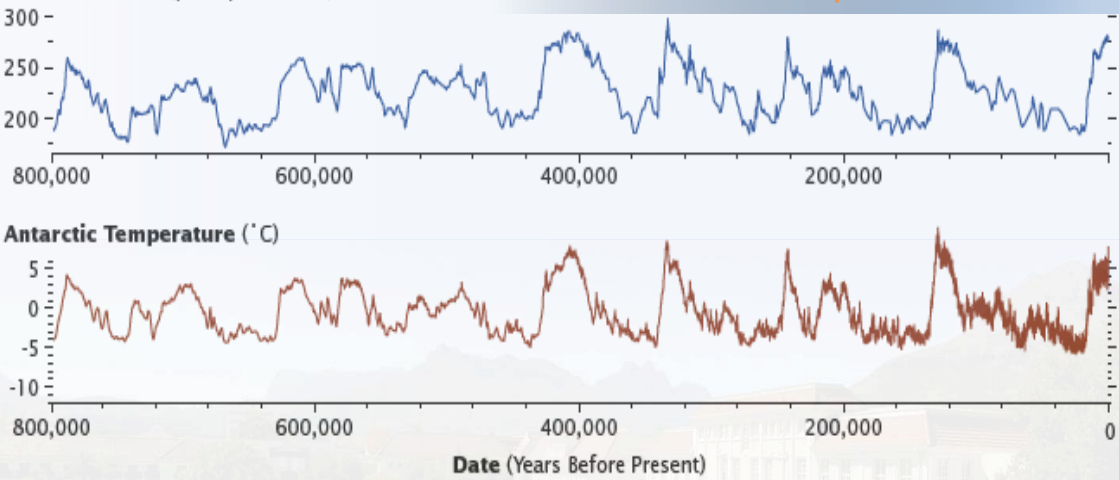
Adaptation
Slowdown
Dissonance

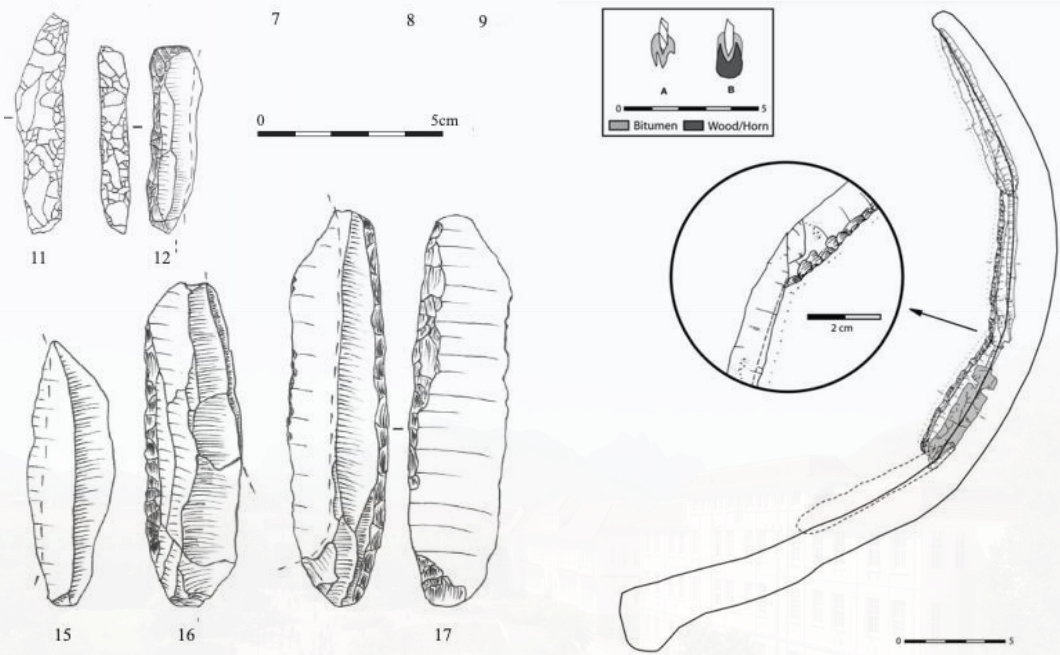
Homo sapiens was born in an Ice Age

https://science.nasa.gov/science-research/earth-science/climate-science/core-questions-an-introduction-to-ice-cores/

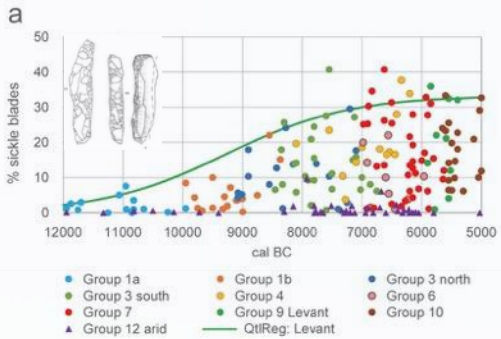
https://www.gpb.org/television/show/nova/season/49/ice-age-footprints

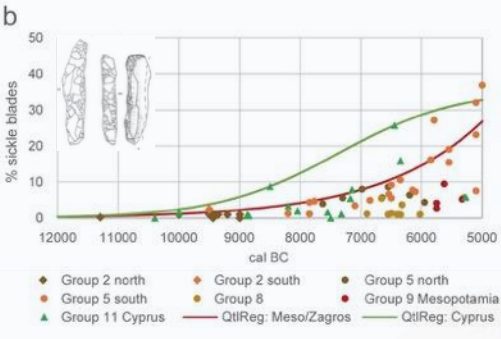
-- -- ----- *Homo sapiens* ----------

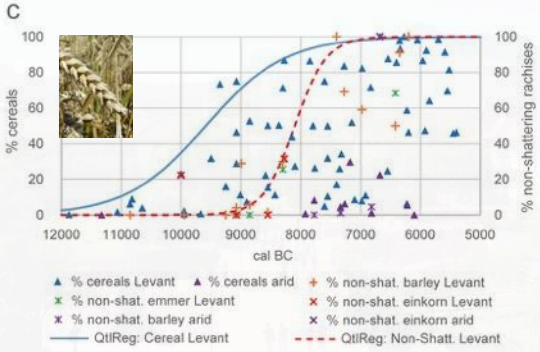


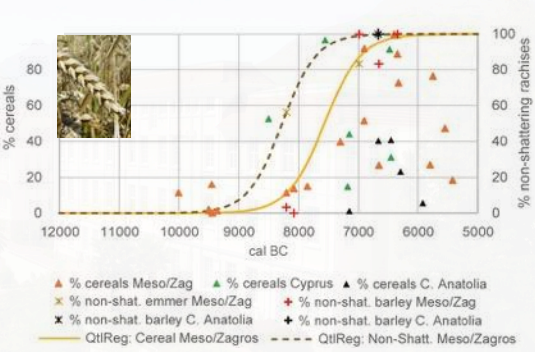


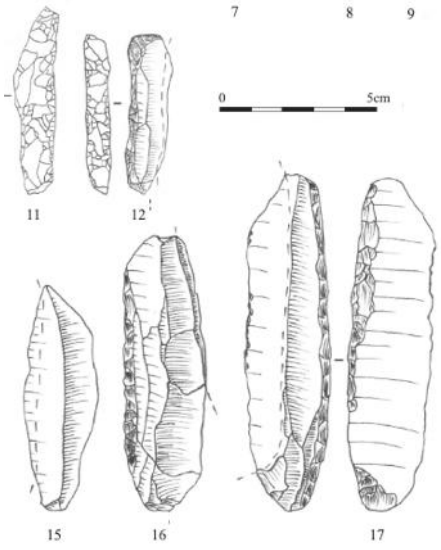
From Borrel and Molist. 2007. Tools and Hafting Systems at Tell Halula (Syria) during the 8th millennium cal. BC Paléorient, vol. 33.2, p. 59-77

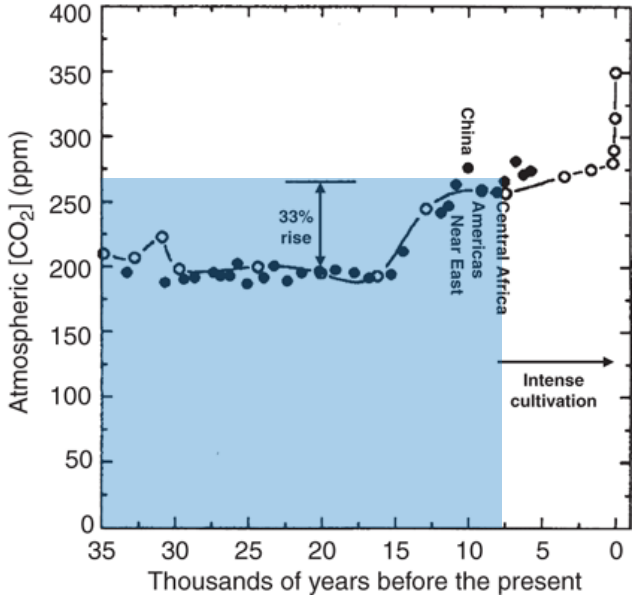

a
% sickle blades
cal BC
Group 1a
Group 1b
Group 3 north
Group 3 south
Group 4
Group 6
Group 7
Group 9 Levant
Group 10
Group 12 arid
QtlReg: Levant


b
% sickle blades
cal BC
Group 2 north
Group 2 south
Group 5 north
Group 5 south
Group 8
Group 9 Mesopotamia
Group 11 Cyprus
QtlReg: Meso/Zagros
QtlReg: Cyprus


c
% cereals
% non-shattering rachises
cal BC
% cereals Levant
% cereals arid
% non-shat. barley Levant
% non-shat. emmer Levant
% non-shat. einkorn Levant
% non-shat. barley arid
% non-shat. einkorn arid
QtlReg: Cereal Levant
QtlReg: Non-Shatt. Levant


% cereals
% non-shattering rachises
cal BC
% cereals Meso/Zag
% cereals Cyprus
% cereals C. Anatolia
% non-shat. emmer Meso/Zag
% non-shat. barley Meso/Zag
% non-shat. barley C. Anatolia
% non-shat. barley C. Anatolia
QtlReg: Cereal Meso/Zagros
QtlReg: Non-Shatt. Meso/Zagros





Sage RF. 1995. Was low atmospheric CO2 during the Pleistocene a limiting factor for the origin of agriculture? Global Change Biology 1: 93–106.

Figure 7. Selected Late Natufian sickle blades:

Figure 7. Selected Late Natufian sickle blades: 1–3. Salibiya, 4–6. Hilazon, 7–9. Fazael, 10–12. NEG. Selected PPNA sickle blades: 13–14. Gilgal I, 15–17. Netiv Hagdud (modified after Belfer-Cohen & Grosman 1997; Nadel 1997; Grosman et al. 1999; Bar-Yosef & Belfer-Cohen 2000; Grosman & Munro 2007; Dag et al. 2010)

Wheat yield response to atmospheric CO_2 level

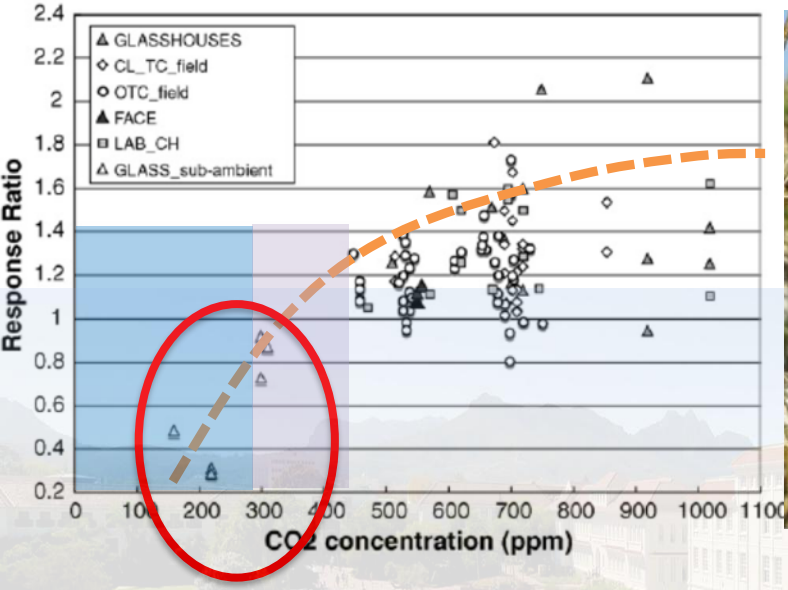


Fig 3 Tubiello et al. / Europ. J. Agronomy 26 (2007) 215–223

Origins

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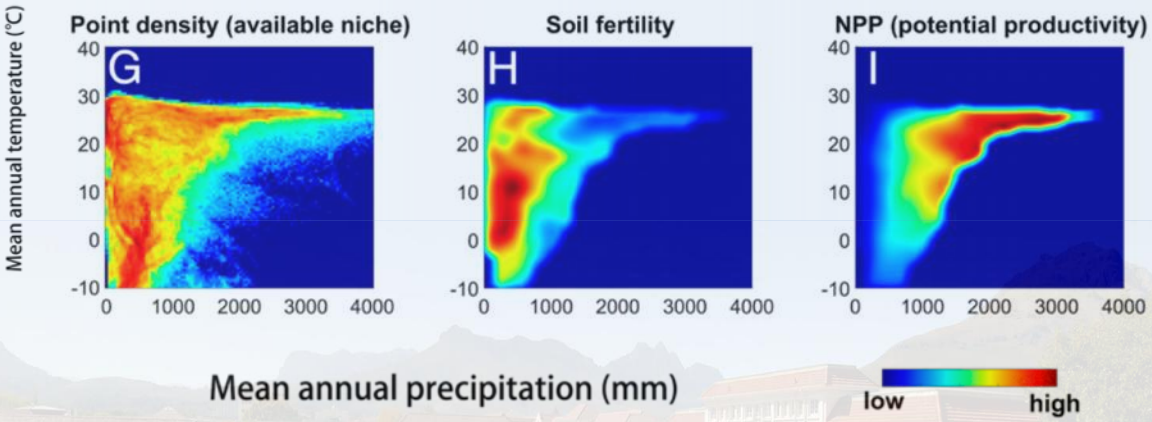
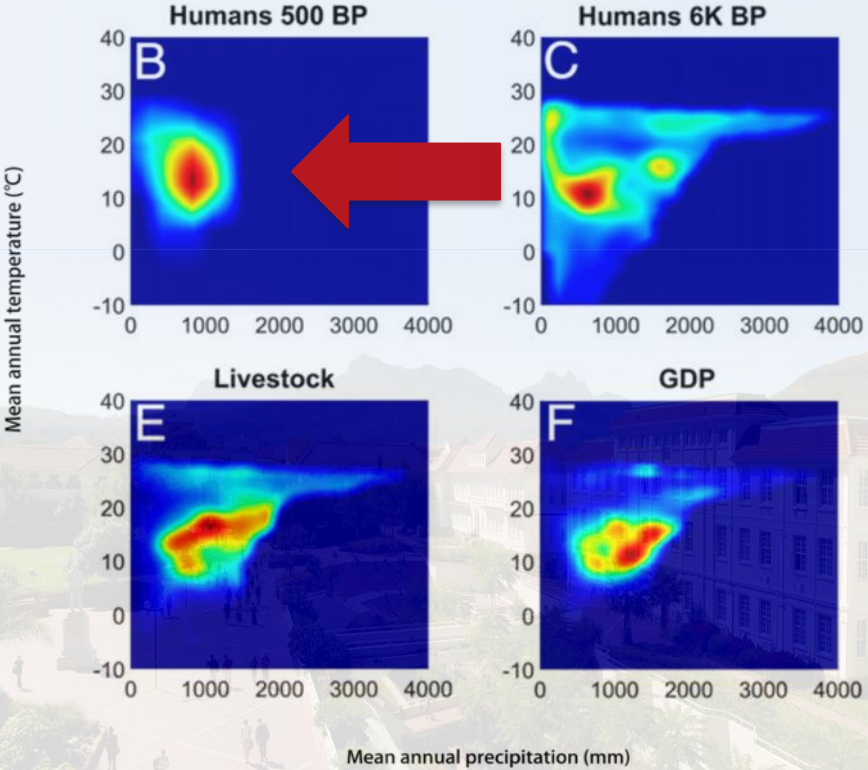
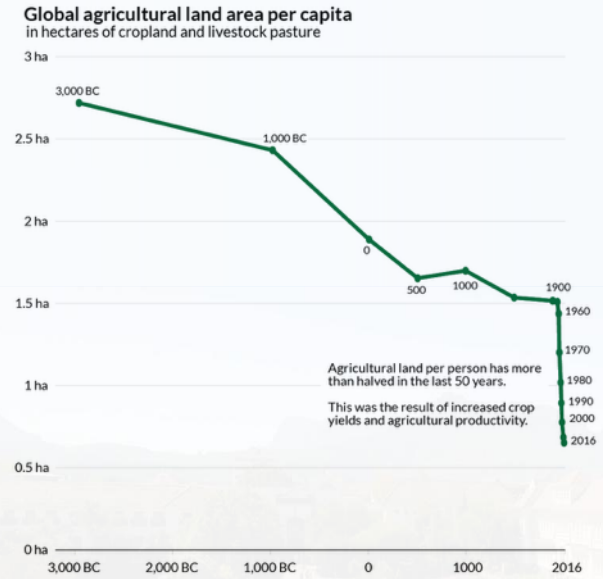
Climatic niche space for *Homo sapiens*

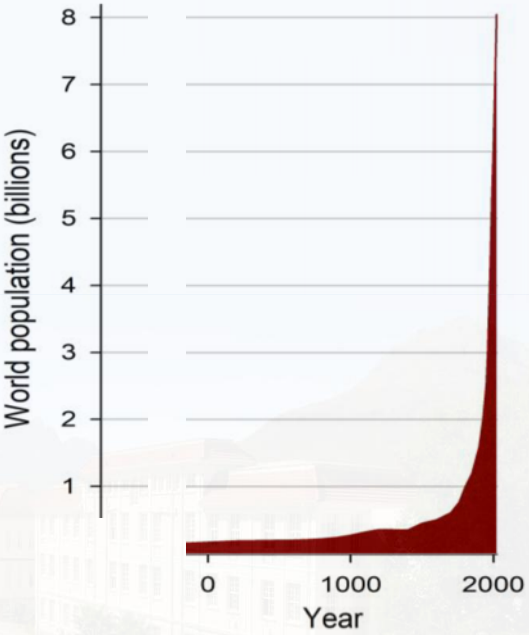


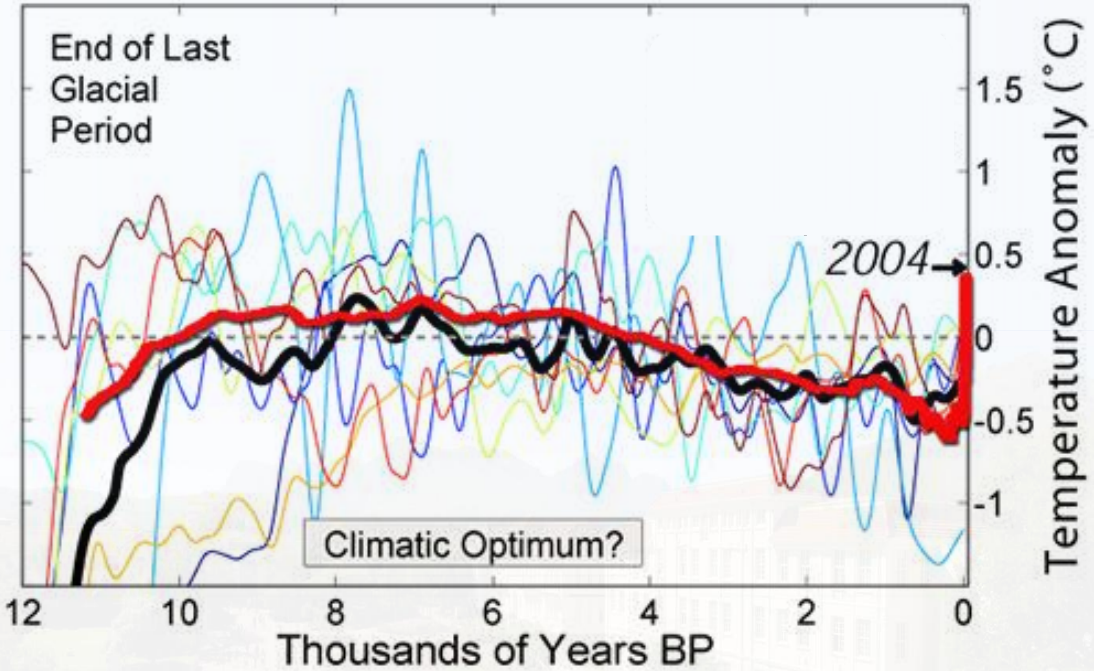
Xu, C., Kohler, T.A., Lenton, T.M., Svenning, J.C. and Scheffer, M., 2020. Future of the human climate niche. *Proceedings of the National Academy of Sciences*, *117*(21), pp.11350-11355.

Ecological niche shift & social transformation for *Homo sapiens*

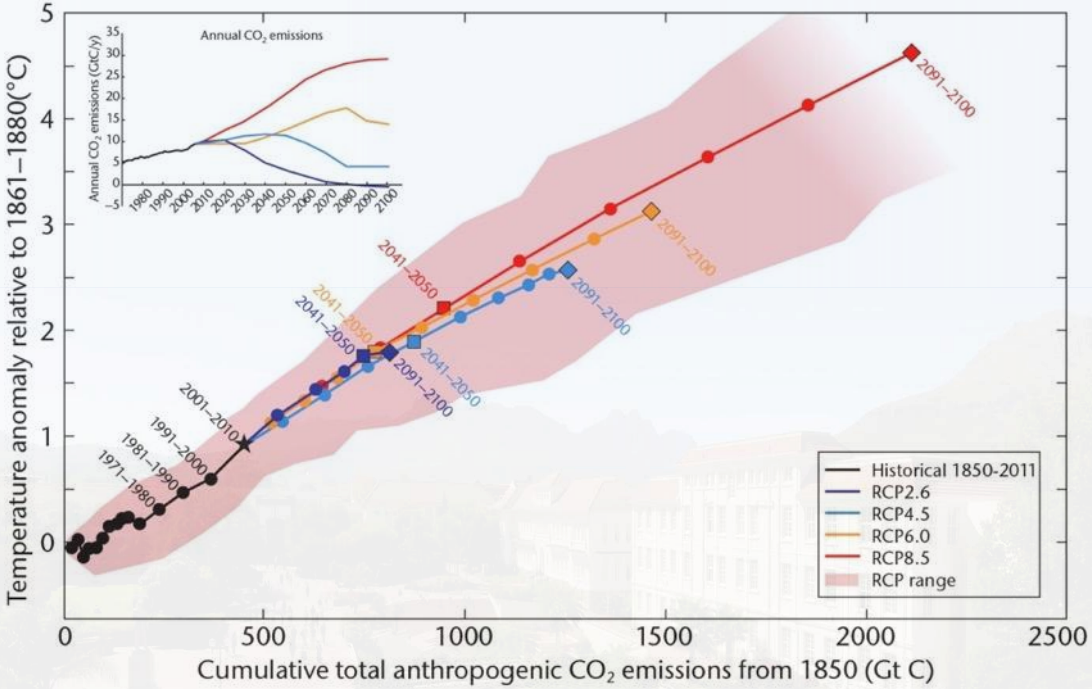



Global agricultural land area per capita
in hectares of cropland and livestock pasture
3 ha
2.5 ha
2 ha
1.5 ha
1 ha
0.5 ha
0 ha
3,000 BC
1,000 BC
0
500
1000
1900
1960
1970
1980
1990
2000
2016
Agricultural land per person has more than halved in the last 50 years.
This was the result of increased crop yields and agricultural productivity.
3,000 BC
2,000 BC
1,000 BC
0
1000
2016
Data source: calculated from the History Database of the Global Environment (HYDE) and UN Population Division.


World population (billions)
8
7
6
5
4
3
2
1
0
1000
2000
Year



Marcott, S.A., Shakun, J.D., Clark, P.U. and Mix, A.C., 2013. A reconstruction of regional and global temperature for the past 11,300 years. science, 339(6124), pp.1198-1201.


Annual CO_2 emissions
Annual CO_2 emissions (GtC/y)
Temperature anomaly relative to 1861–1880(°C)
Cumulative total anthropogenic CO_2 emissions from 1850 (Gt C)
2001–2010
1991–2000
1981–1990
1971–1980
2041–2050
2091–2100
Historical 1850-2011
RCP2.6
RCP4.5
RCP6.0
RCP8.5
RCP range

Main Objectives	Climate risks and opportunities
1. To collect and share blueberry information.	Global information sharing network
4. To provide representatives of Blueberry producing nations a consultative forum for better mutual understanding of items of common interest.	Developing climate adaptation and mitigation policy, e.g. carbon border adjustments (CBAM), soil and water management
6. To promote a better understanding of common interests of producers, marketers, affiliated business, social and governmental organizations throughout the world.	Integrated and holistic IBO engagement from national to international level
8. To encourage world-wide free trade of Blueberries and associated by products, and to dissociate itself with the artificial protection of markets.	Trade x climate policy development positioning and influence
9. To assist countries in regulations that can inhibit growth of the Industry e.g. artificial competition barriers and pesticides registration.	Trade x climate and food safety policy development positioning and influence

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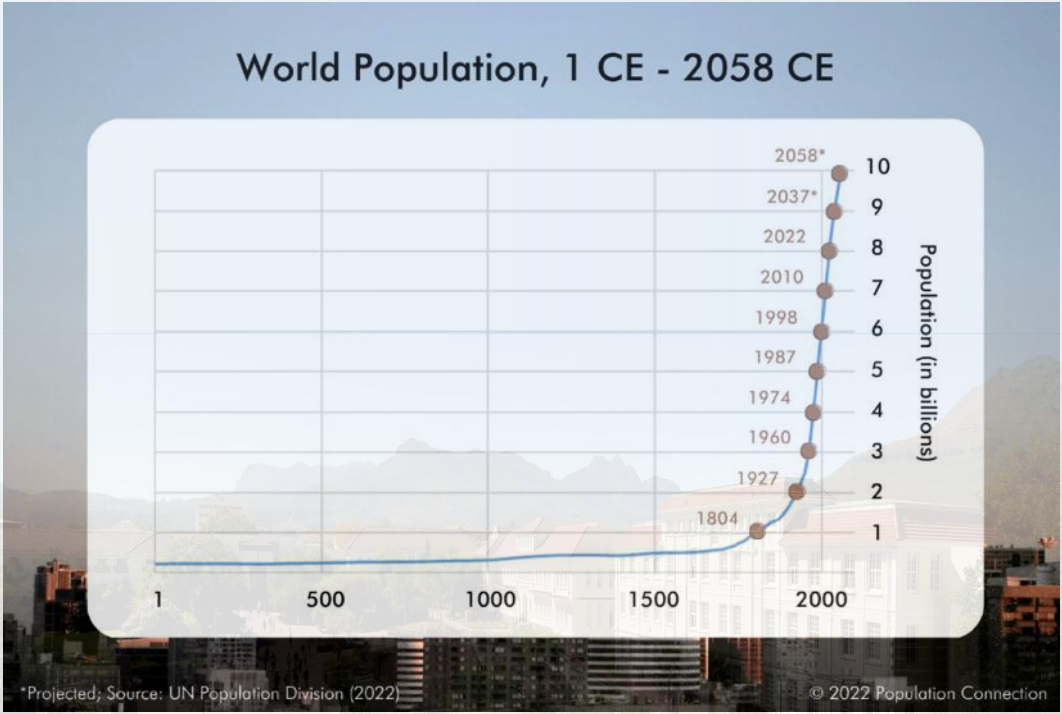
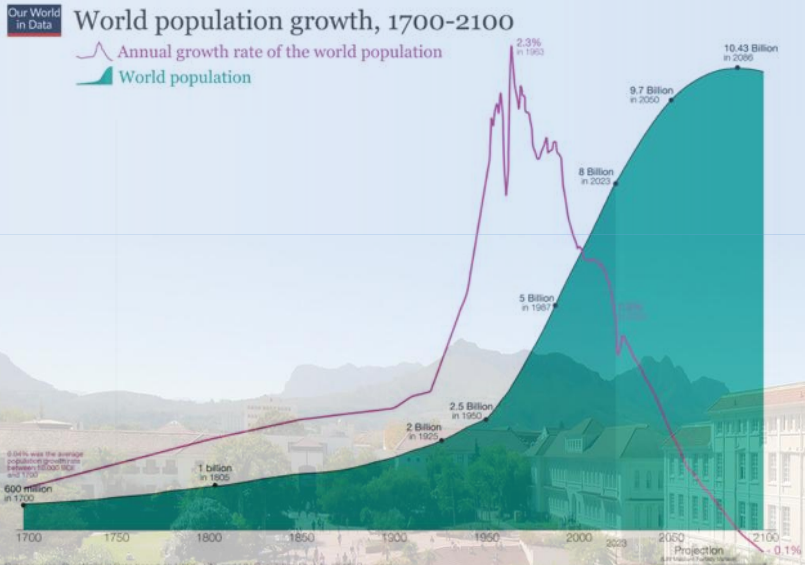


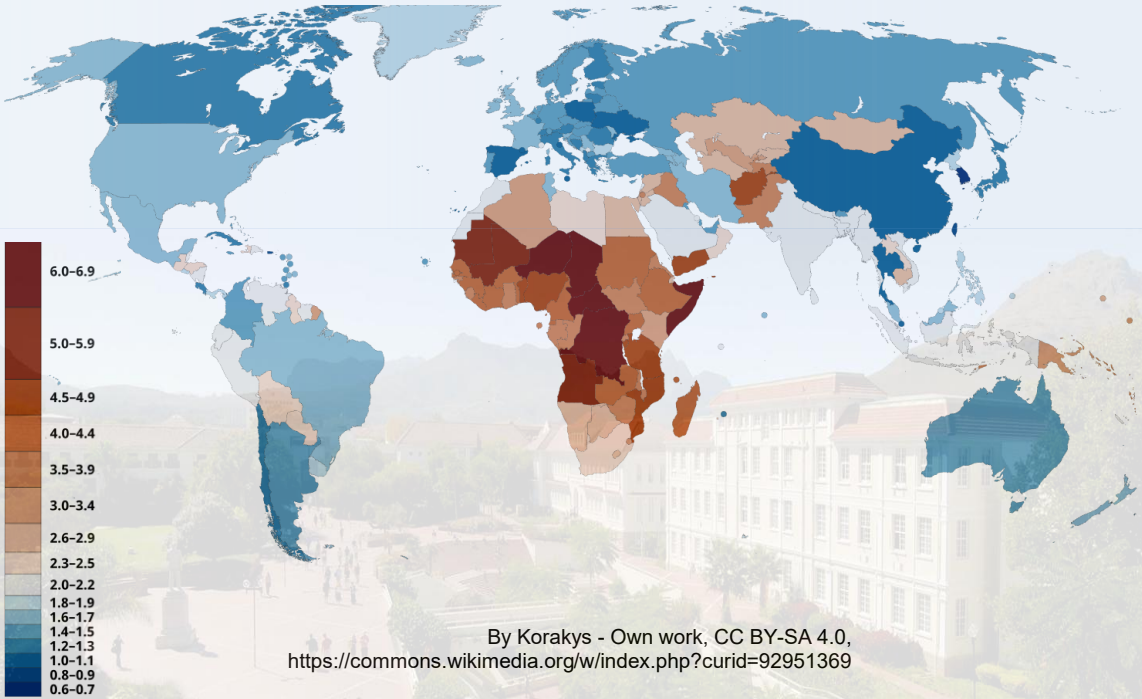
https://populationeducation.org/why-its-important-to-understand-exponential-growth-in-the-modern-world/



Slowdown

The End *of the* Great Acceleration—*and* Why It's Good *for the* Planet, *the* Economy, *and* Our Lives

Danny Dorling



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Strategic Dissonance

An existential state in which strategic positioning is misaligned with social and physical realities

Stellenbosch
UNIVERSITY
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UNIVERSITEIT

forward together
sonke siya phambili
saam vorentoe