

Global Food System Challenges

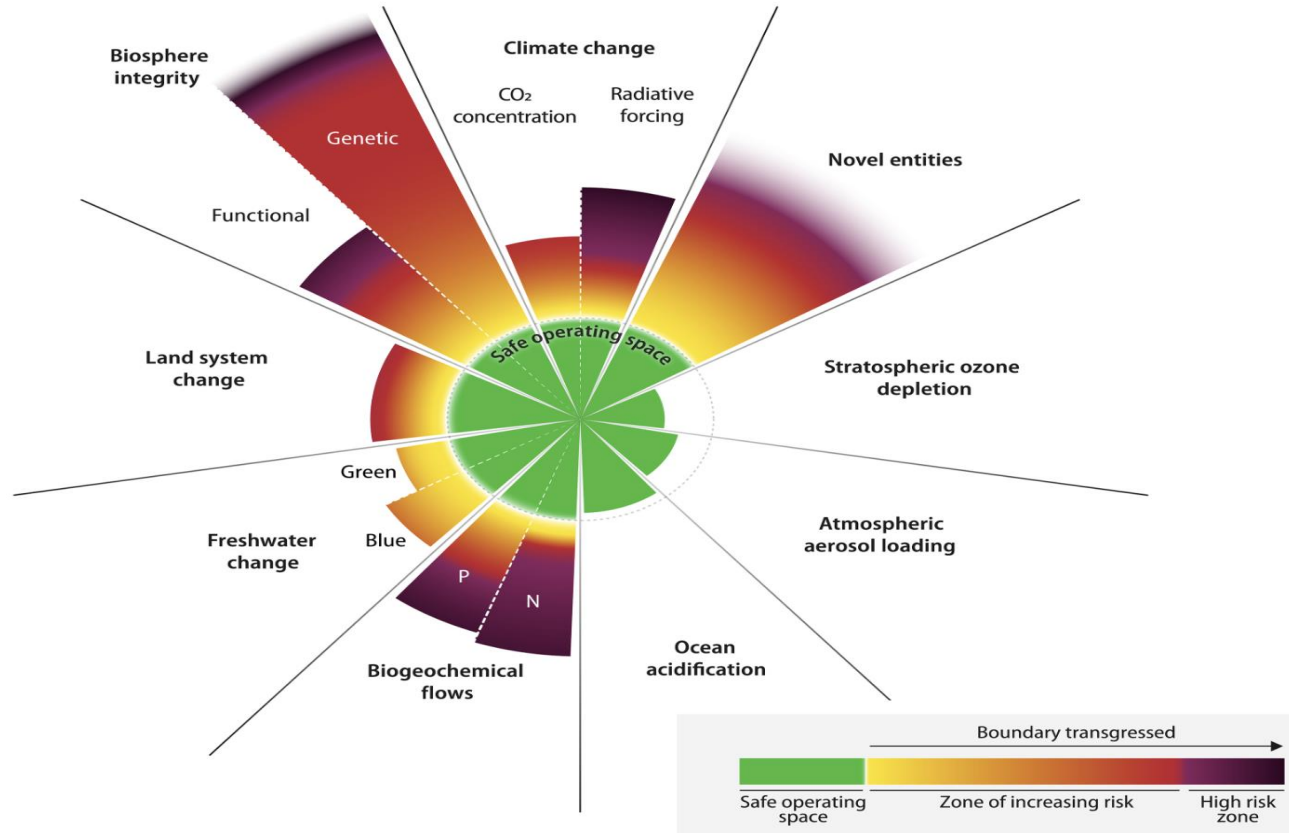


- Enough, healthy, affordable food for everyone
- Climate mitigation and adaptation
- Limitations and protection of natural resources
- Changing ethics and behaviors
- Economics, global vs. local markets

Recently we use our earth 1,7 times of the ecological carrying capacity

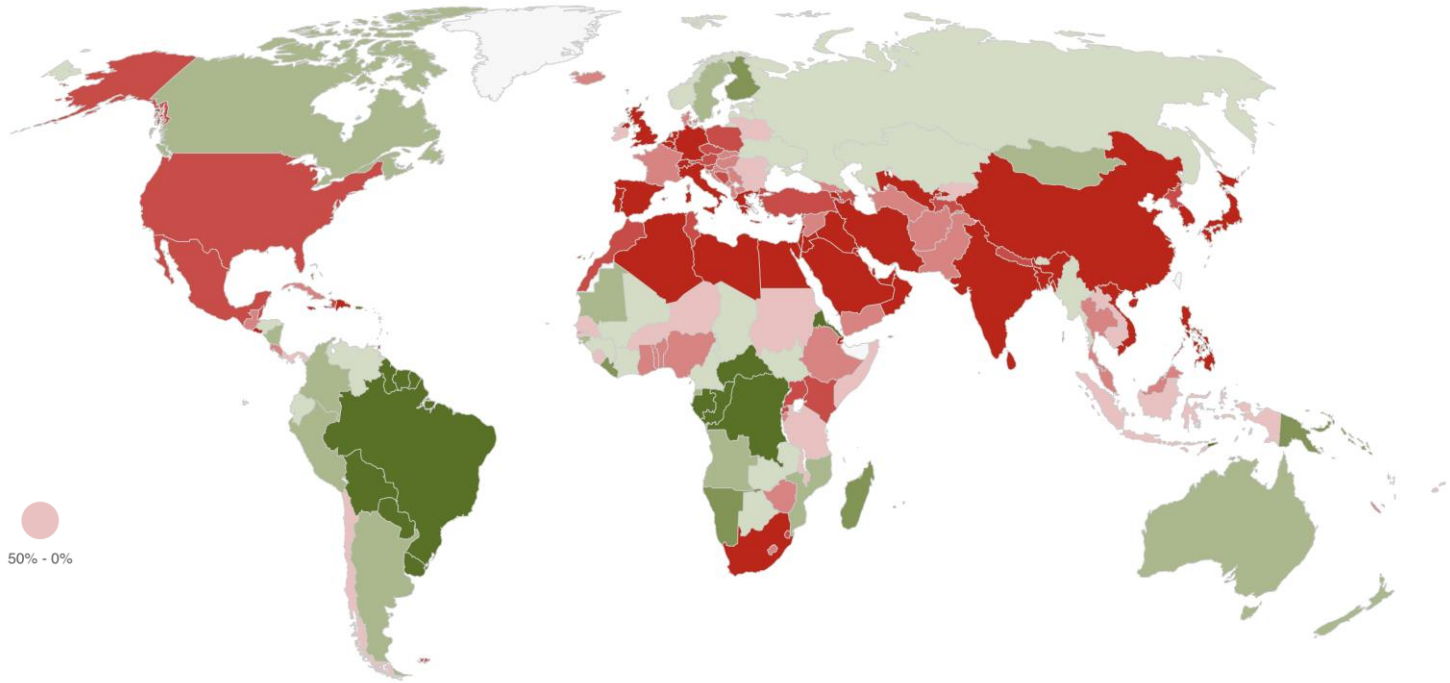
"Organic farming can, must and want contribute to solve these problems!"

Planetary boundaries 2023: 6 of 9 above 100% (2015: 4 of 9)



Rockström et al. (2023) Earth beyond six of nine planetary boundaries.
SCIENCE ADVANCES, 13 Sep 2023,
Vol 9, Issue 37
[DOI: 10.1126/sciadv.adh2458](https://doi.org/10.1126/sciadv.adh2458)

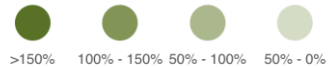
Ecological Footprints 2021



BIOCAPACITY DEBTORS
FOOTPRINT GREATER THAN BIOCAPACITY



BIOCAPACITY CREDITORS
BIOCAPACITY GREATER THAN FOOTPRINT



ECOLOGICAL DEFICIT/RESERVE



TOTAL ECOLOGICAL FOOTPRINT



ECOLOGICAL FOOTPRINT PER PERSON



TOTAL BIOCAPACITY



BIOCAPACITY PER PERSON

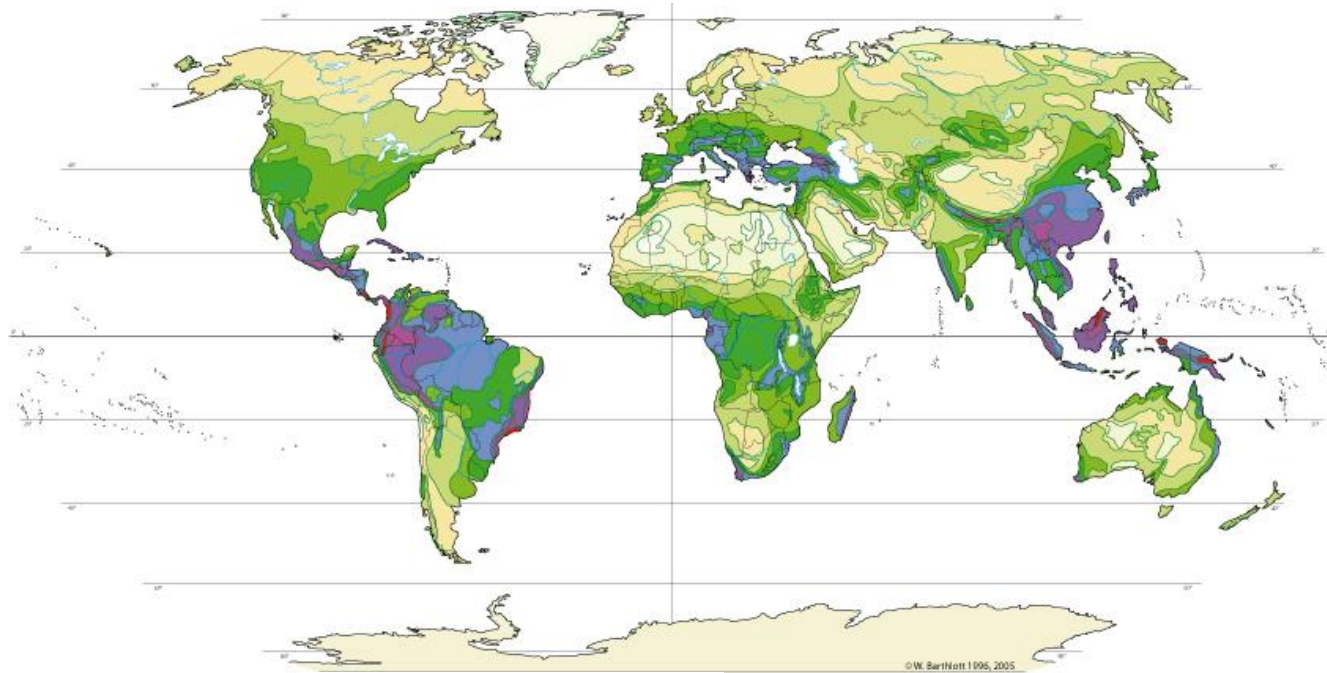
<https://data.footprint.org>

Biodiversity – the diversity of life



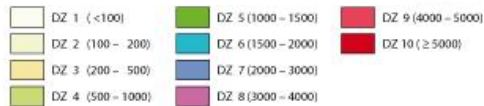
in everyone of these drops are
millions of different species

Biodiversity

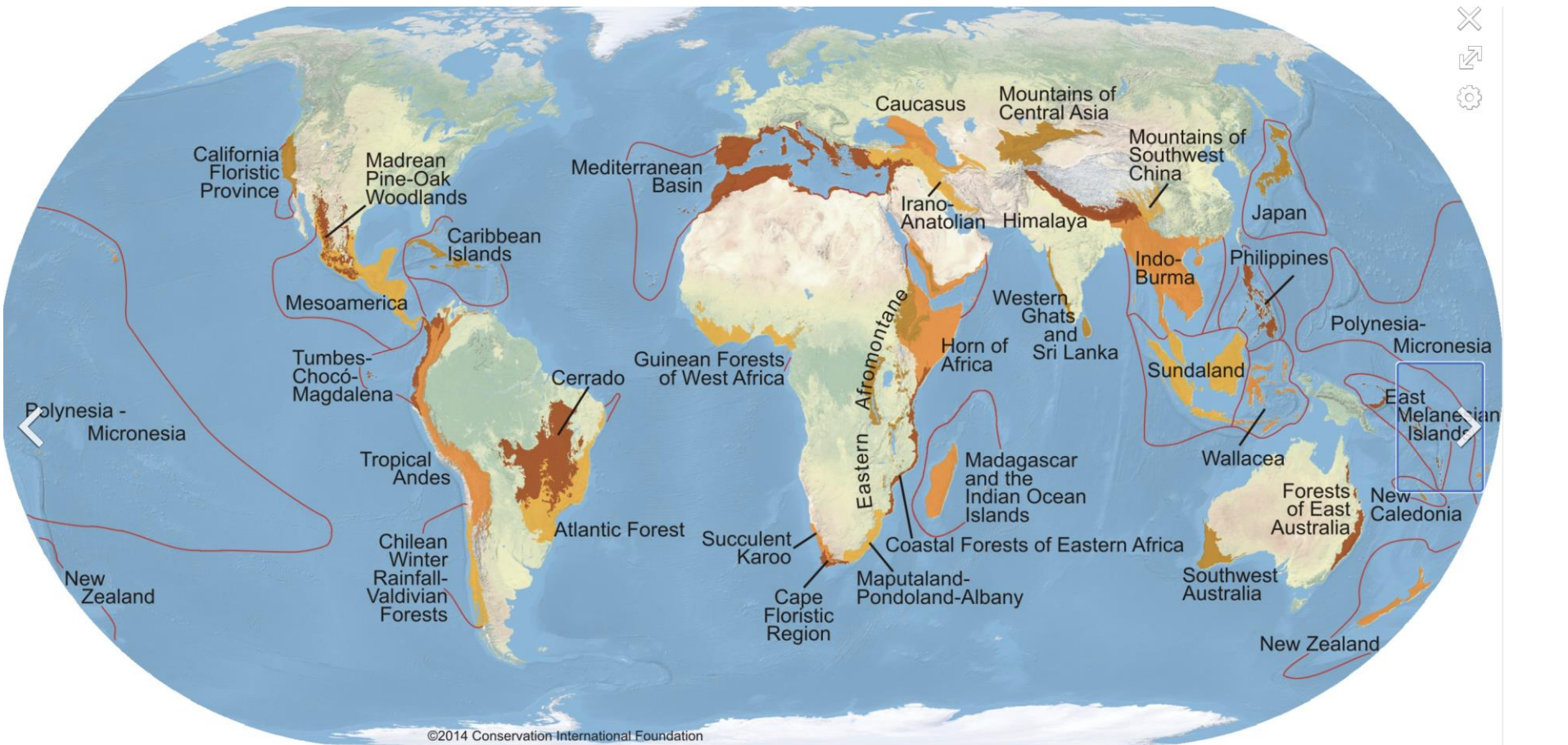


Robinson-Projektion
Standard-Parallelen 38°N und 38°S

Plant species per 10,000 km²



W. Barthlott, G. Ren, H. Kraft, W. Kipke, D. Rathgeber,
S. J. Muller 2005
Verändert nach
W. Barthlott, W. Lauer & A. Plaecke 1995
Neu erstellt für Biodiversität der Pflanzen
Universität Bonn



Conservation International 2014

Prof. Dr. Gerold Rahmann
Thünen-Institute of Organic Farming

Soils:

the 30 cm skin of the earth

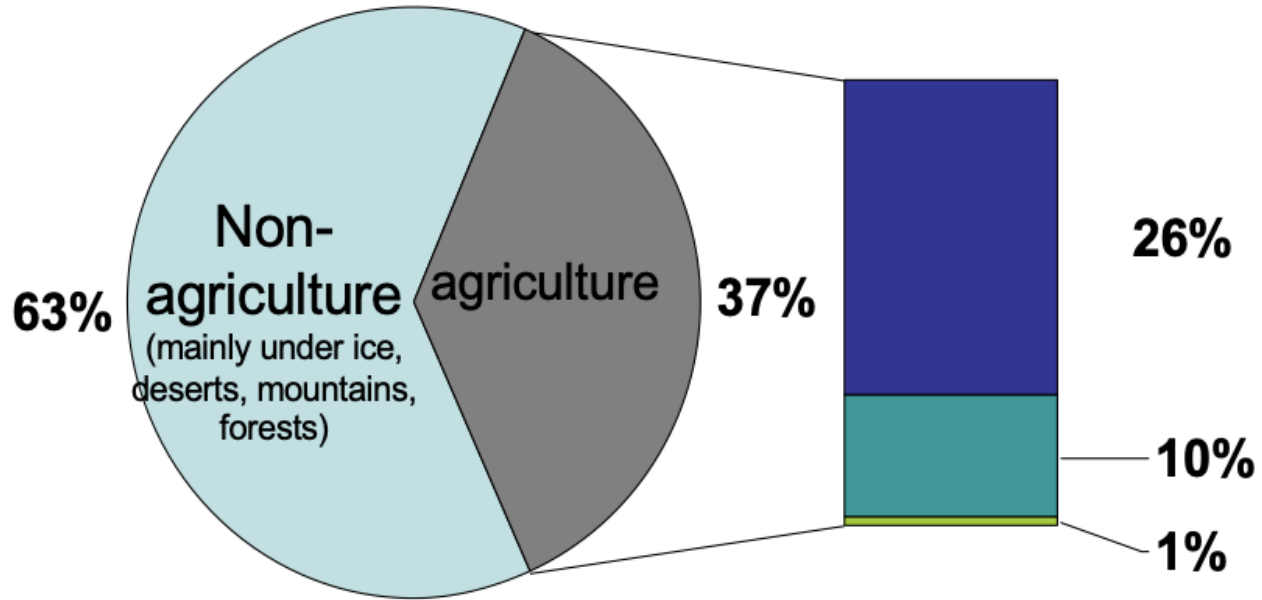
- does nourish of (food/feed) plants
- CO₂ sink (organic matter)
- filter and transitions zone between air and underground
- rich in biodiversity



1 cow = 500 kg LW



World land-use



■ non-agricultural ■ pasture ■ arable land ■ permanent crops

Biodiversity of Agri and Culture



<https://research.rabobank.com/far/en/sectors/regional-food-agri/nexit-would-harm.html>









Western Europe has no natural nature anymore!

Rainforest



becomes



farmland

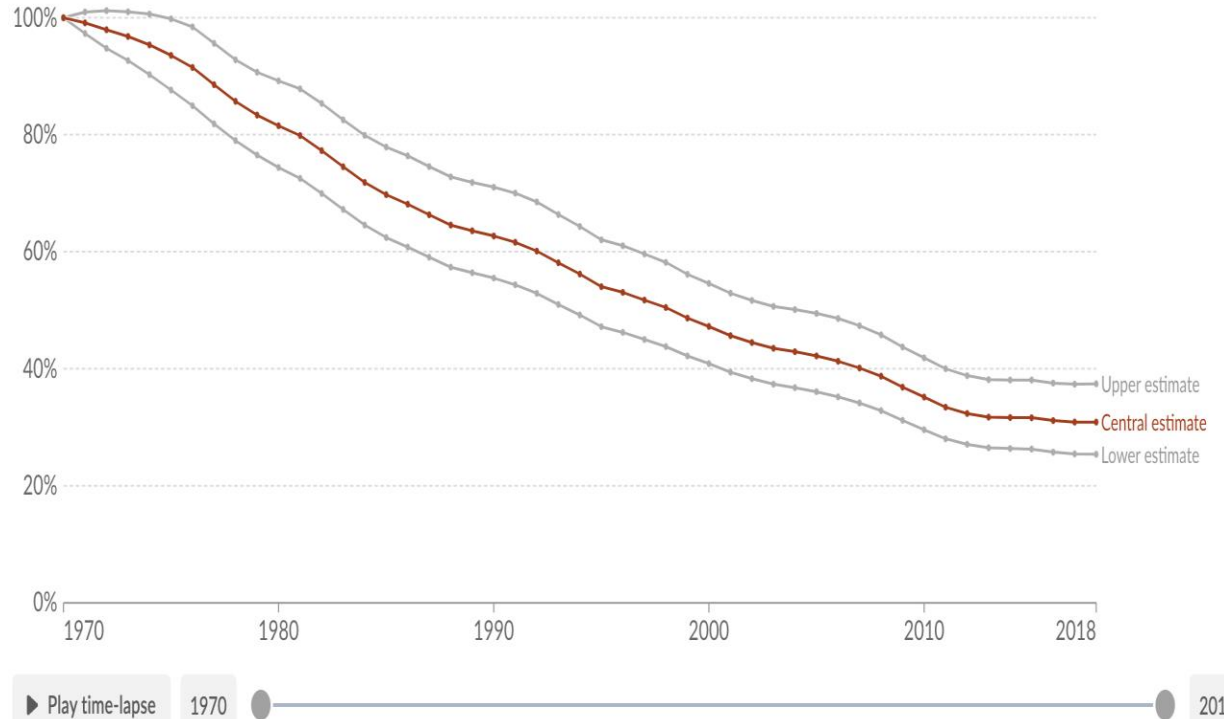
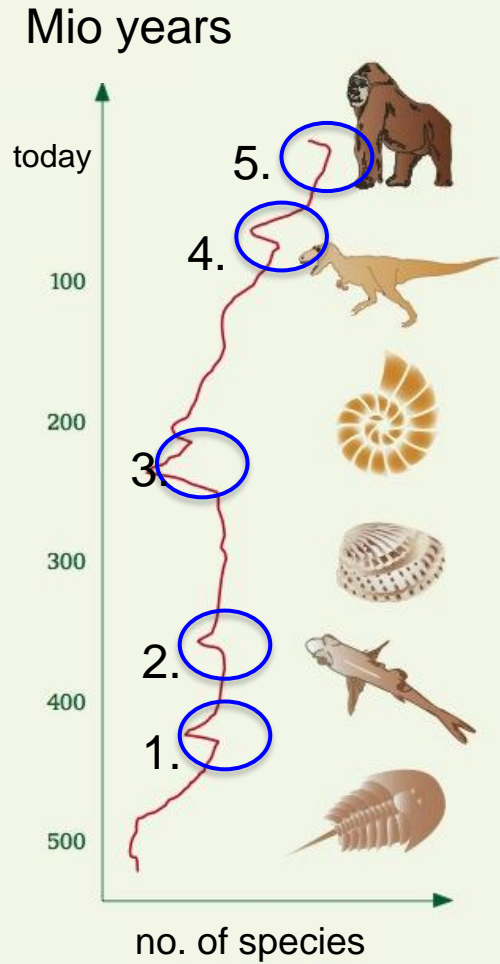


Renewable palm oil trees in Indonesia for EU fuel

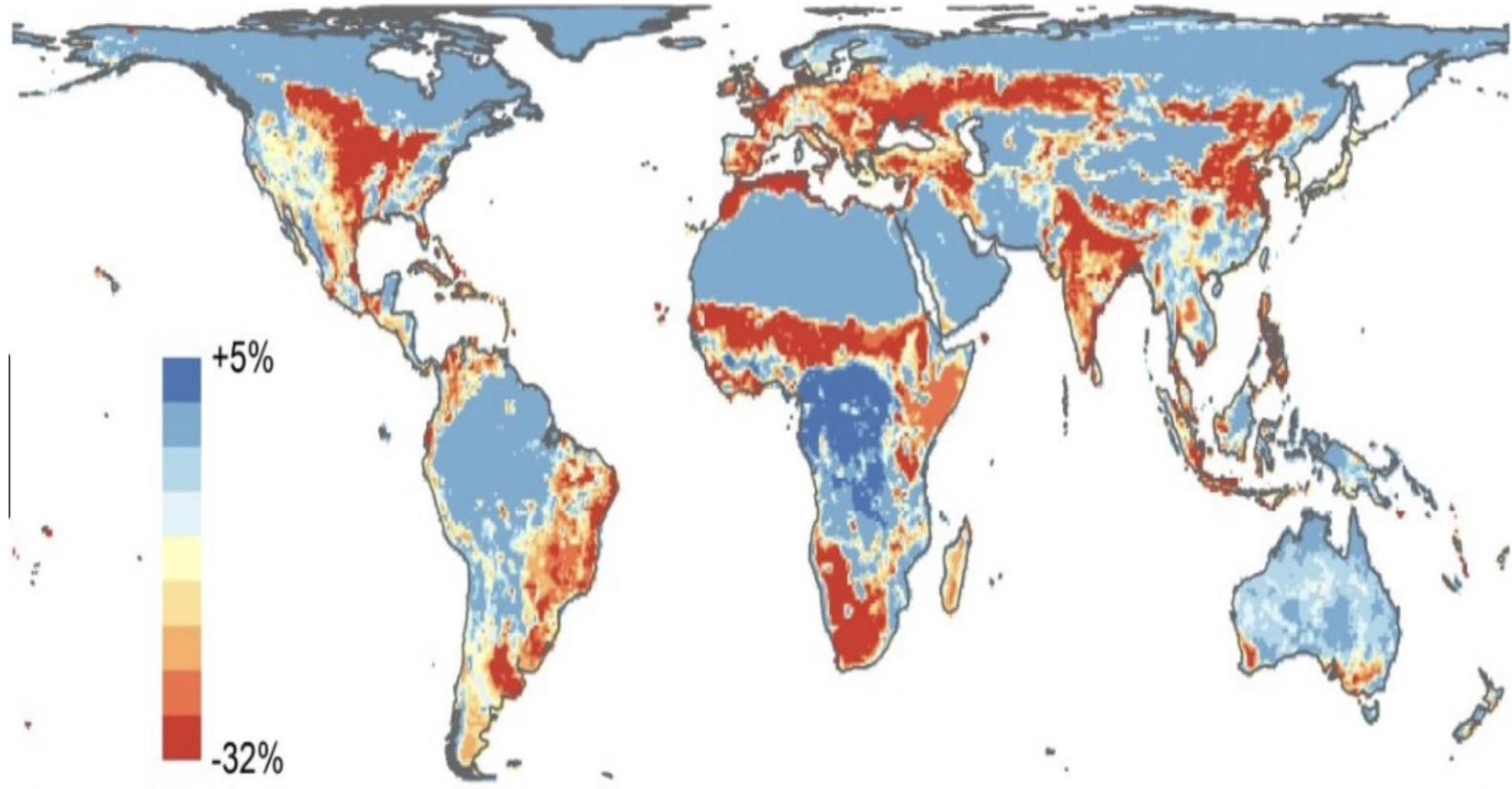


Living Plant Index (1970 – 2018)

WWF 2022



Biodiversity development since 1970





Farmers do not like all biodiversity success stories



Pesticides are used against biodiversity



	Pesticide use kg/ha	
	1990	2021
World	1.2	2.3
Europe	1.4	1.8
Germany	2.5	4.1
Netherlands	10.2	10.9
Denmark	2.2	1.3

FAOstat 2023



No Pesticide use is better for biodiversity: go organic

Biodiversity in the Organic regulation 848/2018

KAPITEL II: MÅL OG PRINCIPPER FOR ØKOLOGISK PRODUKTION

- **Artikel 4: Mål**

De generelle mål med økologisk produktion er

c) bidrag til en høj grad af biodiversitet

i) bidrag til en høj grad af biodiversitet, navnlig ved at anvende forskelligartet plantegenetisk materiale såsom økologisk, heterogent materiale samt økologiske sorter, der er egnet til økologisk produktion

- **Artikel 5: Generelle principper**

Økologisk produktion er et bæredygtigt forvaltningssystem, der bygger på følgende generelle principper:

b) bevarelse af naturlige landskabselementer såsom naturarvslokaliteter

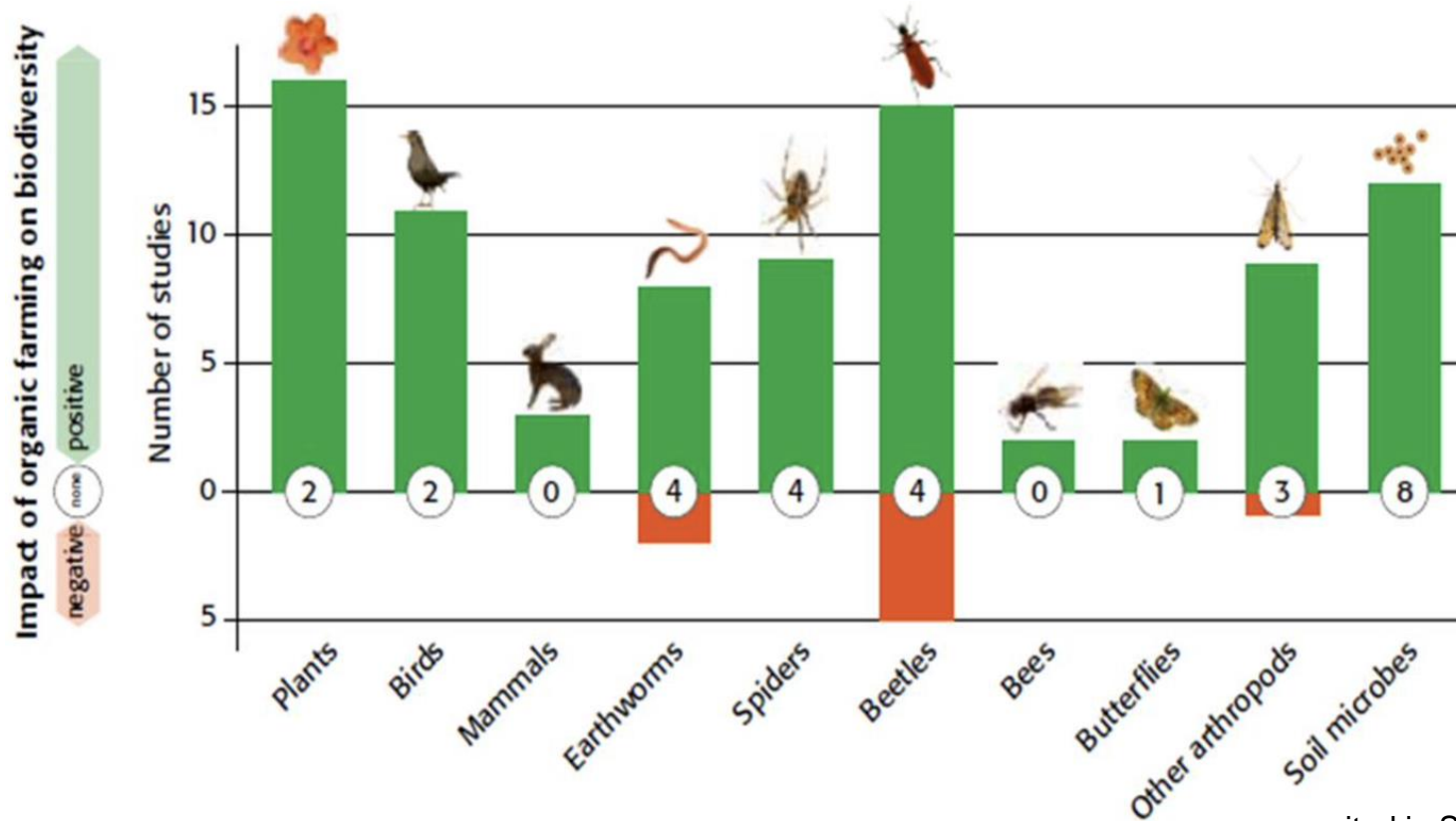
Organic Farming !?

Der wirkliche Hofbesitzer wird versuchen, mit seinem Land sorgsam umzugehen und es nicht auszubeuten. Er möchte das „Herz“ seines Landes, die Fruchtbarkeit, verbessern und erhalten. Er wird durch Beobachten der Natur lernen, daß Getreide-Monokultur oder das Halten einer einzigen Tierart auf ein und demselben Stück Land nicht der natürlichen Ordnung der Dinge entspricht. Zur größtmöglichen Ausdehnung natürlicher Formen und um deren Überleben zu sichern, wird er Tiere und Pflanzen auf seinem Besitze aufzuehen. Er wird die gegenseitige Beeinflussung unter ihnen verstehen und fördern. Er wird sogar einige Stücke Wildnis auf seinem Lande lassen, wo wilde Lebensformen sich entfalten können. Wo er anbaut, denkt er immer an die Bedürfnisse des Bodens, immer den Nutzen jeder Pflanze und jedes Tieres für den Boden abwägend. Über alledem wird er erkennen, daß er den Kreislauf des Lebens beeinflusst (ein Teil dessen er selbst ist). Er macht es auf eigene Verantwortung, denn er kann ein Eingreifen in das natürliche Gleichgewicht nicht vermeiden.



(Seymour, 1972)

Biodiversity impacts of organic farming cover wide range of species and ecosystems



cited in Sanders & Heß 2019

EU Organic farming target

EU: 25% till 2030,
because of Biodiversity advantages

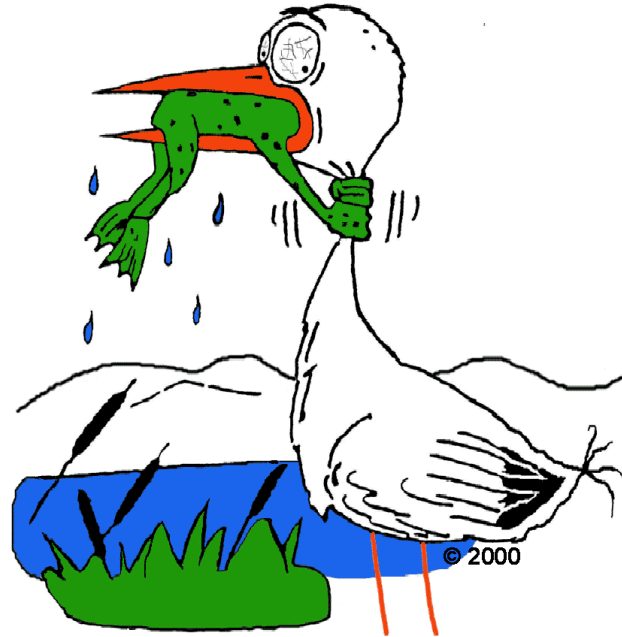
(Green Deal, Farm to Fork plan 2019)

Is there hope? ...

... never give up !!!

What

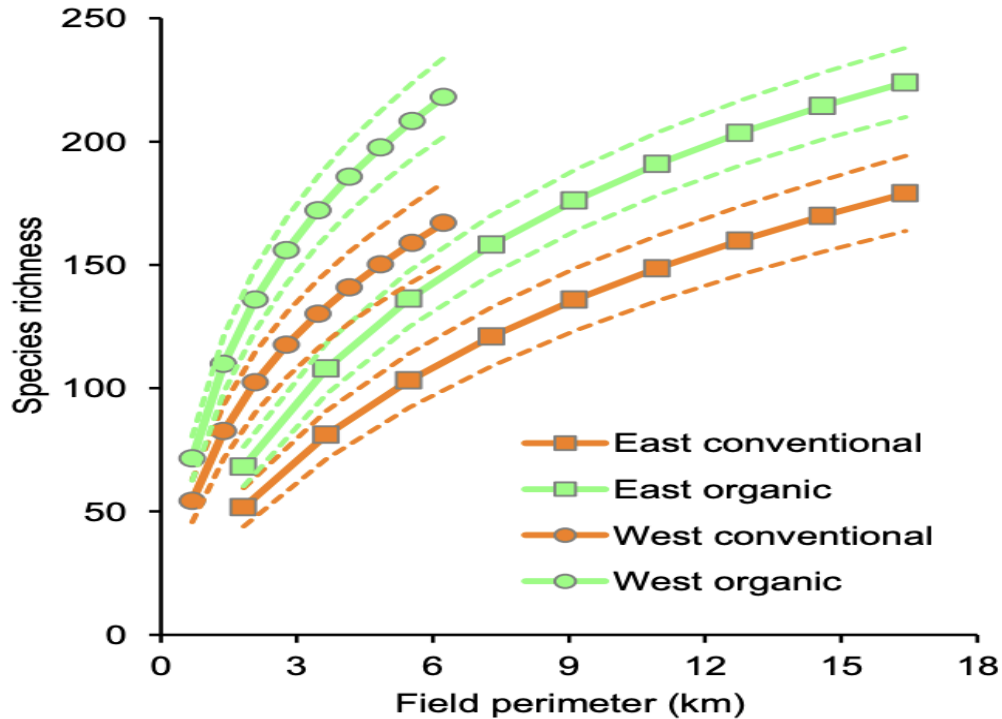
do



to

???????

Make fields smaller



Batáry et al. 2017





Wide crop rotations and winter stubble fields



Give wild and rare seeds a chance

- only 200 from total 300.000 plant species are used für food
- 3 crop species (maize, rice, wheat) contribute by 60% to human food

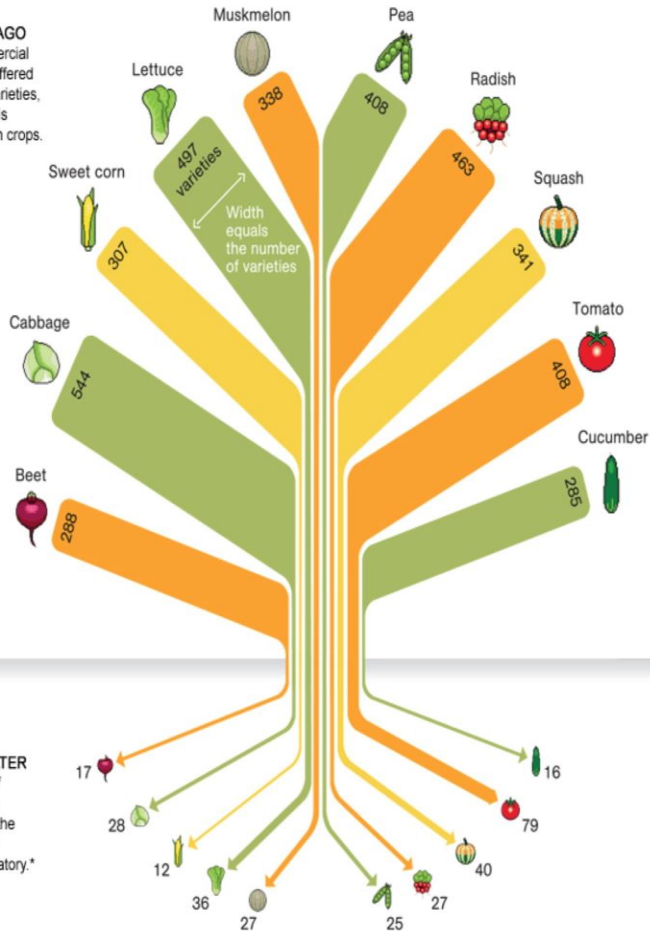


Make esthetic and colorfull farming



Painting by Gottfried Hoyer

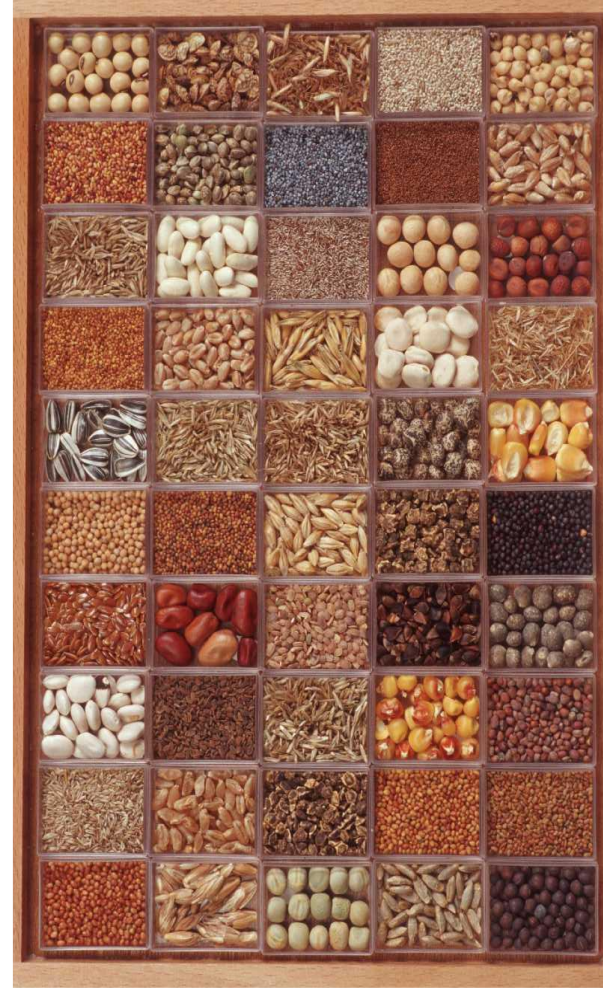
A CENTURY AGO
 In 1903 commercial seed houses offered hundreds of varieties, as shown in this sampling of ten crops.



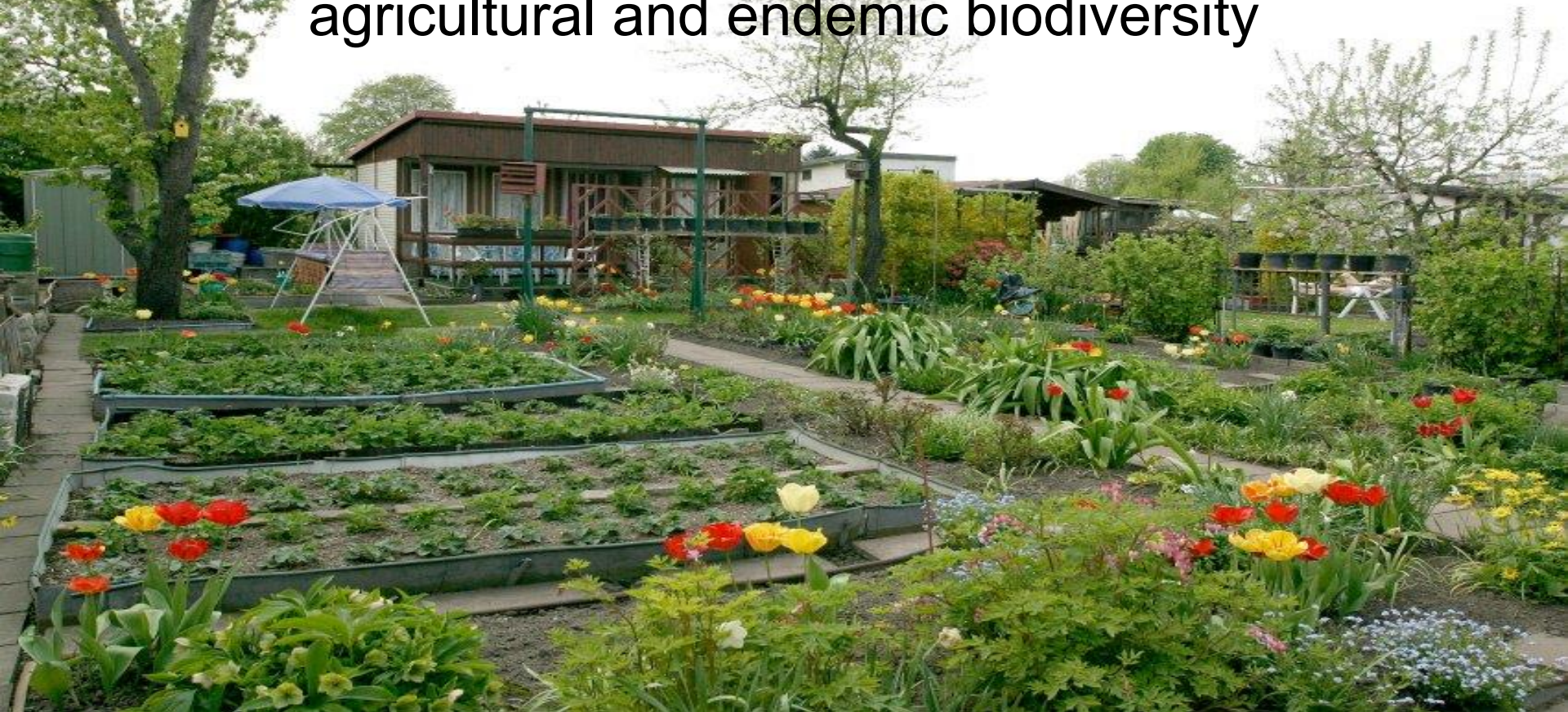
80 YEARS LATER
 By 1983 few of those varieties were found in the National Seed Storage Laboratory.*

Preserve Food diversity

- only 200 from total 300.000 plant species are used für food
- 3 crop species (maize, rice, wheat) contribute by 60% to human food



Consider backyard (hobby) farming for rich agricultural and endemic biodiversity



Consumer – Producer networks (e.g. CSAs) are innovative



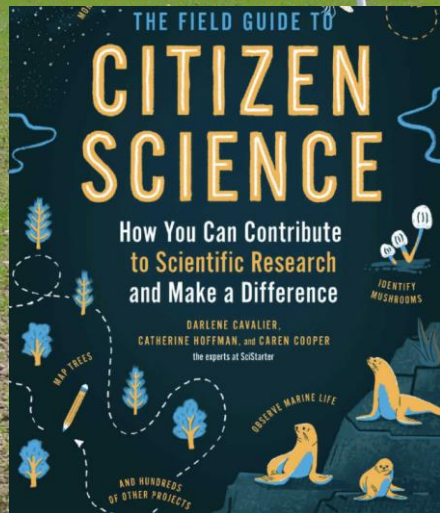


Show and explain your work: simple and proud

Not only grassland and cropland are your farm:
also biotopes needs your appreciation and care

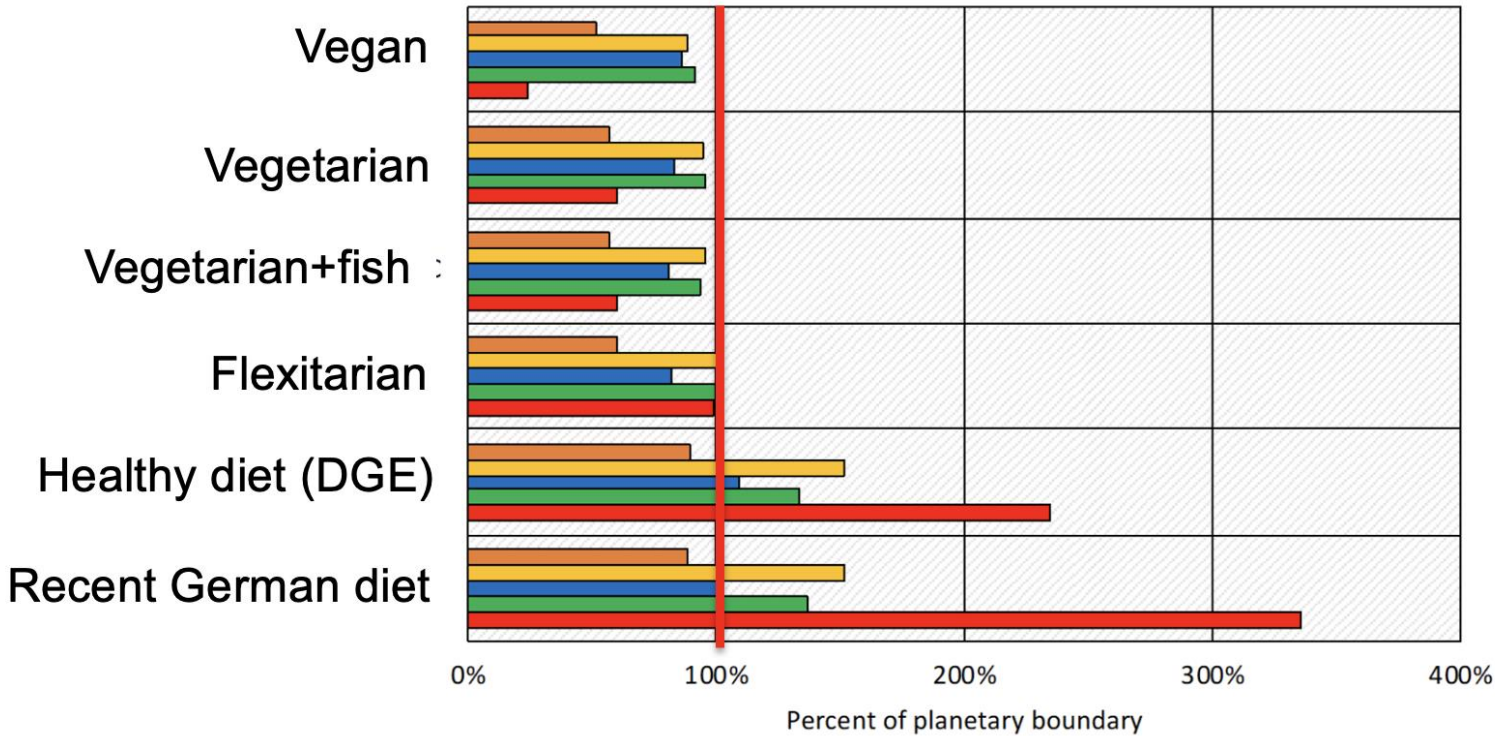


Check your biodiversity



Planetary Healthy Diets for 10 billion people (EAT-Lancet Commission)

Phosphorus Nitrogen Freshwater Cropland GHG emissions



Springmann M et al. (2018) The EAT Lancet Commission. Options for keeping the food system within environmental limits. Nature 562, 519–525.

A photograph of a sunset sky with three birds flying in a shape that resembles a smile. The sky transitions from a deep blue at the top to a warm orange and pink near the horizon. The foreground shows dark silhouettes of trees and a body of water.

Thanks