LUND UNIVERSITY

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FACULTY OF ENGINEERING

Klimaforandringerne og deres ulige konsekvenser

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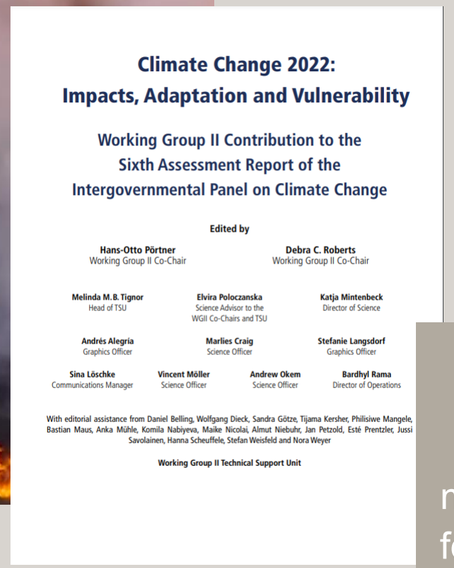
Hovedpointer

1. Konsekvenser for en lang, lang række forhold
2. IPCC AR6: “Every small increase in warming will result in increased risks”
3. Store geografiske uligheder i klimaforandringernes konsekvenser og ansvar

Forskning om klimaforandringernes konsekvenser



Climate Change 2022:
Impacts, Adaptation and Vulnerability

Working Group II Contribution to the
Sixth Assessment Report of the
Intergovernmental Panel on Climate Change

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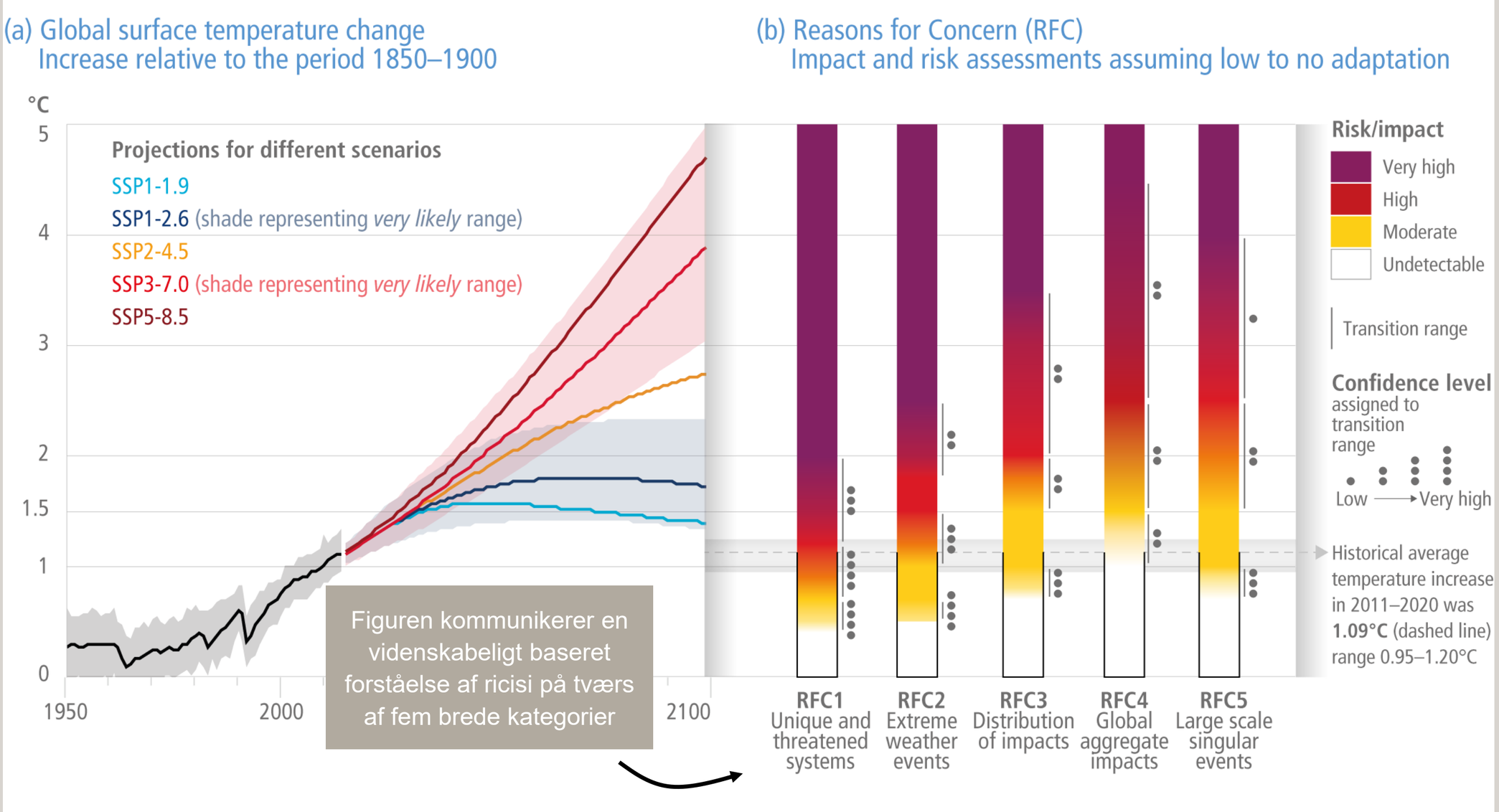
Working Group II Technical Support Unit

3068 sider

Sammenfatter mere end 34.000 forskningsartikler

IPCCs forsøg på at opsummere konsekvenser i én figur

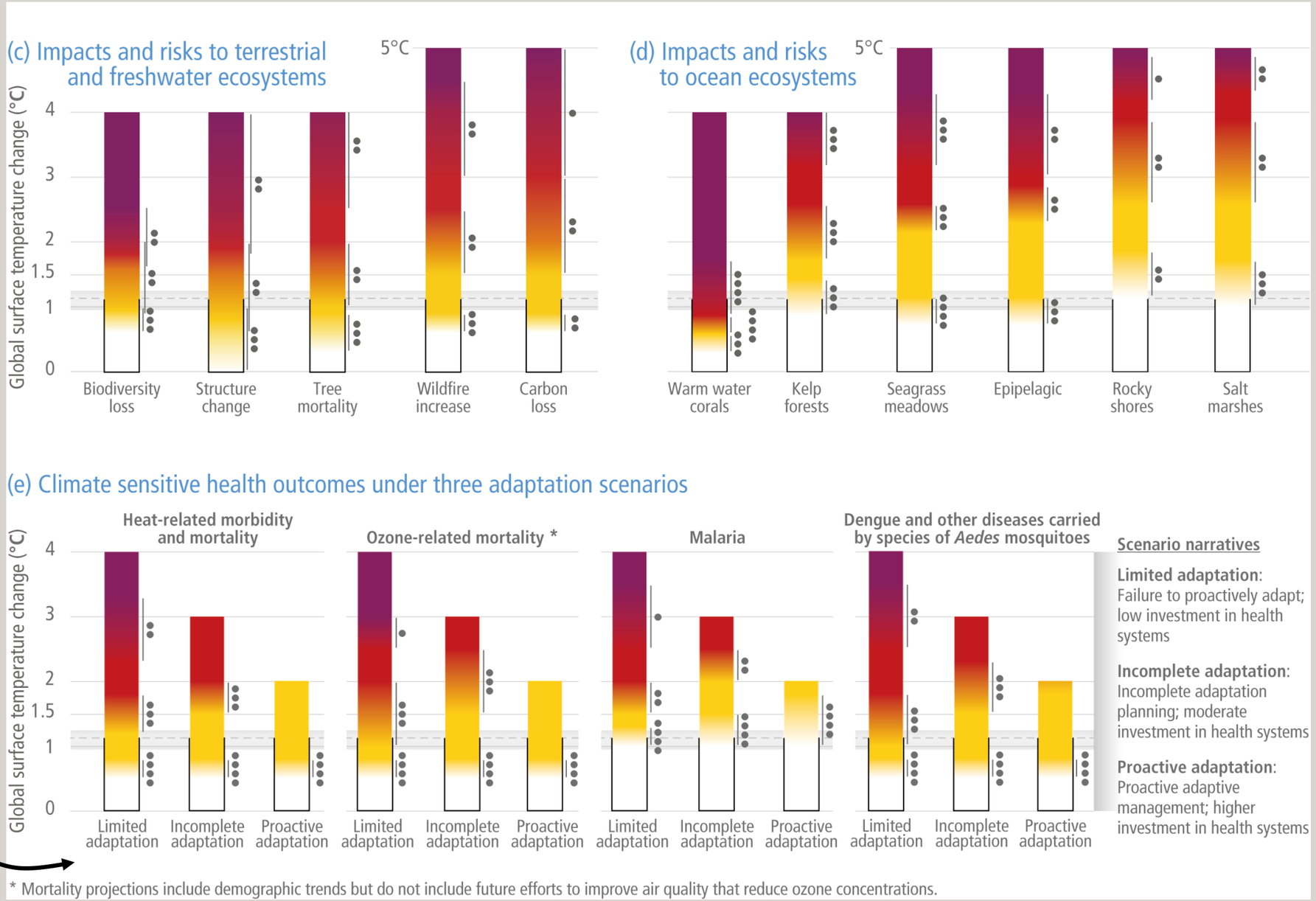
Global and regional risks for increasing levels of global warming



Figuren kommunikerer en videnskabeligt baseret forståelse af ricisi på tværs af fem brede kategorier

Figure SPM.3 in IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-33, doi:10.1017/9781009325844.001.

IPCCs forsøg på at opsummere konsekvenser i én figur



Klima-tilpasning og investeringer i sundhedssystemer afgørende for konsekvenserne

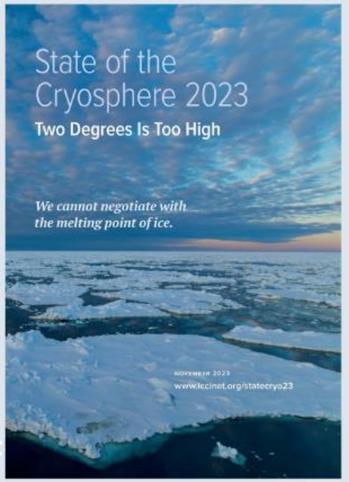
Figure SPM.3 in IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-33, doi:10.1017/9781009325844.001.

Eksempler på konsekvenser

State of the Cryosphere 2023

Two Degrees is Too High

READ THE REPORT



Havvandsstigninger på kort sigt

Omkring en milliard mennesker i lavtliggende byer og små østater i risiko for oversvømmelse i midten af dette århundrede på grund af havvandsstigninger

Havvandsstigninger på lang sigt

1,5 grader → 6-9 meter

2 grader → 12-20 meter

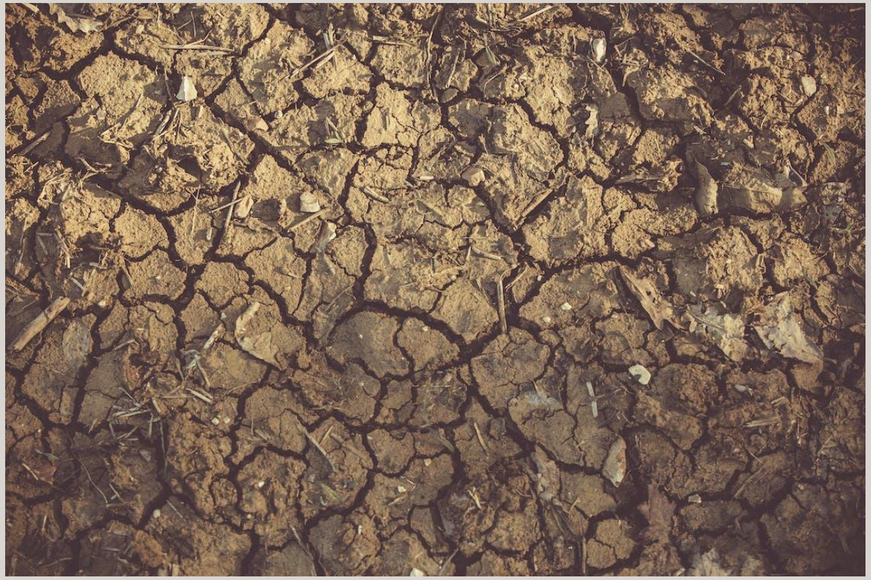
3 grader → enorme stigninger langt hurtigere

Kilde: IPCC (2022); ICCI (2023)

Eksempler på konsekvenser

<u>Hedebølger og sundhed</u>

Store regionale forskelle i varme-relaterede dødfald som følge af hyppigere og voldsommere hedebøæger.



<u>Fødevaresikkerhed og vandmangel</u>

Klimaforandringerne vil i højere og højere grad påvirke muligheden for tilgang til mad og fødevarer særligt I sårbare regioner gennem tørke, oversvømmelse, hedebølger, havvandsstigninger, vandmangel, m.m.

Kilde: IPCC (2022)

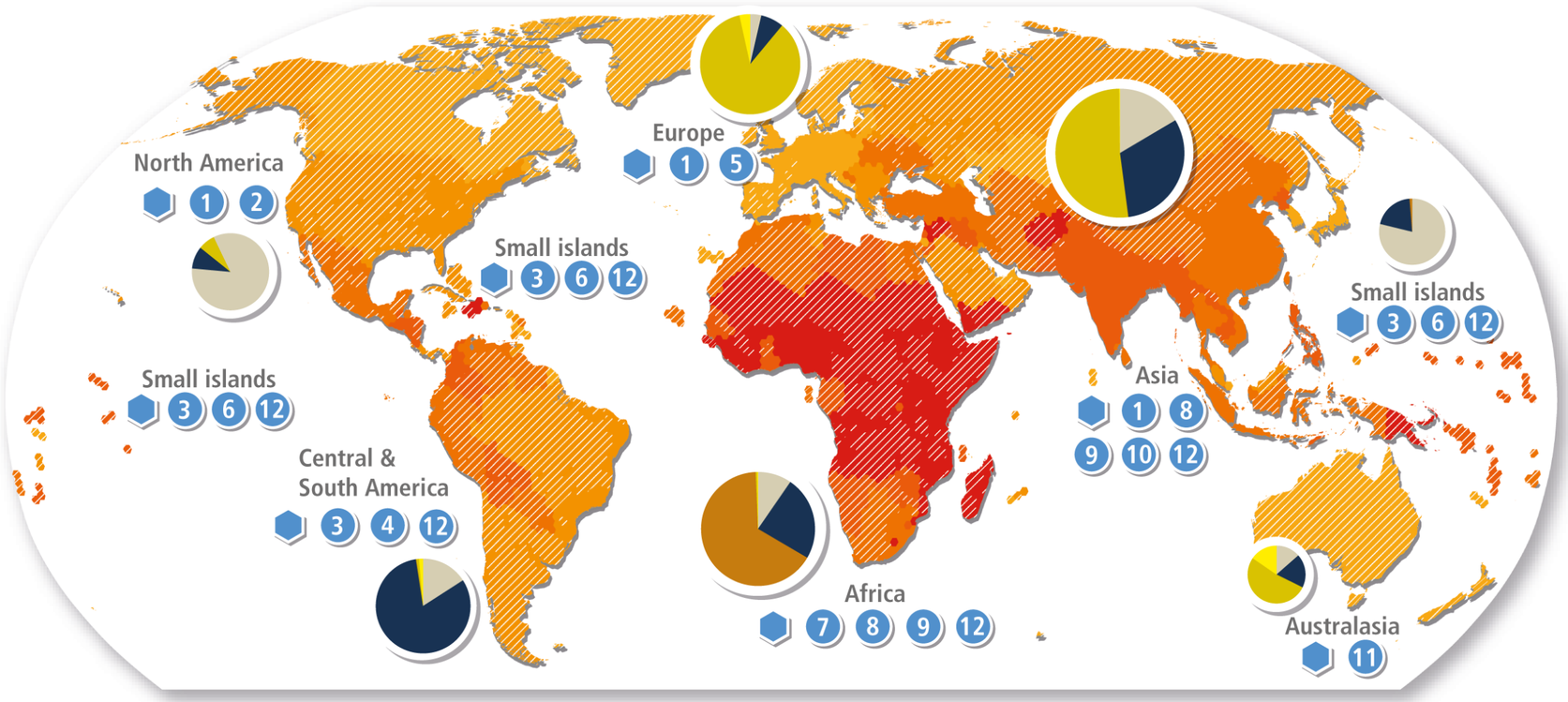
Sammenhænge forstærker konsekvenser

- Flere hændelser forstærker hinanden og øger risici
- Et eksempel fra IPCC AR6 WP2

Observed human vulnerability to climate change is a key risk factor and differs globally

Vulnerability at the national level varies. Vulnerability also greatly differs within countries.
Countries with moderate or low average vulnerability have sub-populations with high vulnerability and vice versa.

3,3 – 3,6 milliarder mennesker lever i områder som er særligt sårbare (IPCC, 2022)



Relative vulnerability

- Very high
- High
- Medium
- Low
- Very low

Population density

- High
- Low

Pie charts

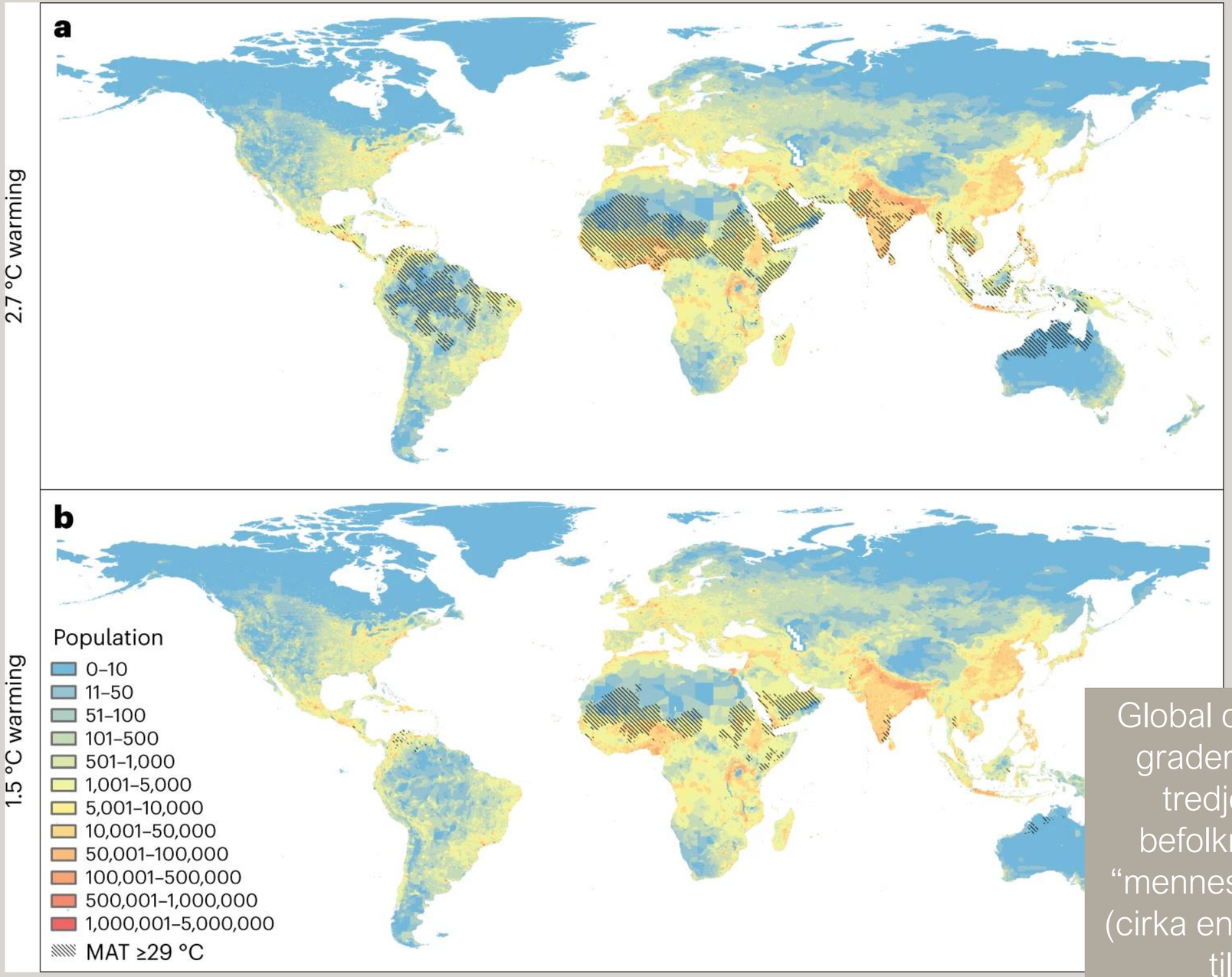
Flood · Storm · Drought · Heat · Wild Fires

The size of the pie charts show average mortality per hazard event per region between 2010 and 2020.
The slices of pie charts show the distribution of deaths from a particular hazard.

Examples of vulnerable local groups across different contexts include the following:

1. **Indigenous Peoples of the Arctic** | health inequality, limited access to subsistence resources and culture | CCP 6.2.3, CCP 6.3.1
2. **Urban ethnic minorities** | structural inequality, marginalisation, exclusion from planning processes | 14.5.9, 14.5.5, 6.3.6
3. **Smallholder coffee producers** | limited market access & stability, single crop dependency, limited institutional support | 5.4.2
4. **Indigenous Peoples in the Amazon** | land degradation, deforestation, poverty, lack of support | 8.2.1, Box 8.6
5. **Older people, especially those poor & socially isolated** | health issues, disability, limited access to support | 8.2.1, 13.7.1, 6.2.3, 7.1.7
6. **Island communities** | limited land, population growth and coastal ecosystem degradation | 15.3.2
7. **Children in rural low-income communities** | food insecurity, sensitivity to undernutrition and disease | 5.12.3
8. **People uprooted by conflict in the Near East and Sahel** | prolonged temporary status, limited mobility | Box 8.1, Box 8.4
9. **Women & non-binary** | limited access to & control over resources, e.g. water, land, credit | Box 9.1, CCB-GENDER, 4.8.3, 5.4.2, 10.3.3
10. **Migrants** | informal status, limited access to health services & shelter, exclusion from decision-making processes | 6.3.6, Box 10.2
11. **Aboriginal and Torres Strait Islander Peoples** | poverty, food & housing insecurity, dislocation from community | 11.4.1
12. **People living in informal settlements** | poverty, limited basic services & often located in areas with high exposure to climate hazards | 6.2.3, Box 9.1, 9.9, 10.4.6, 12.3.2, 12.3.5, 15.3.4

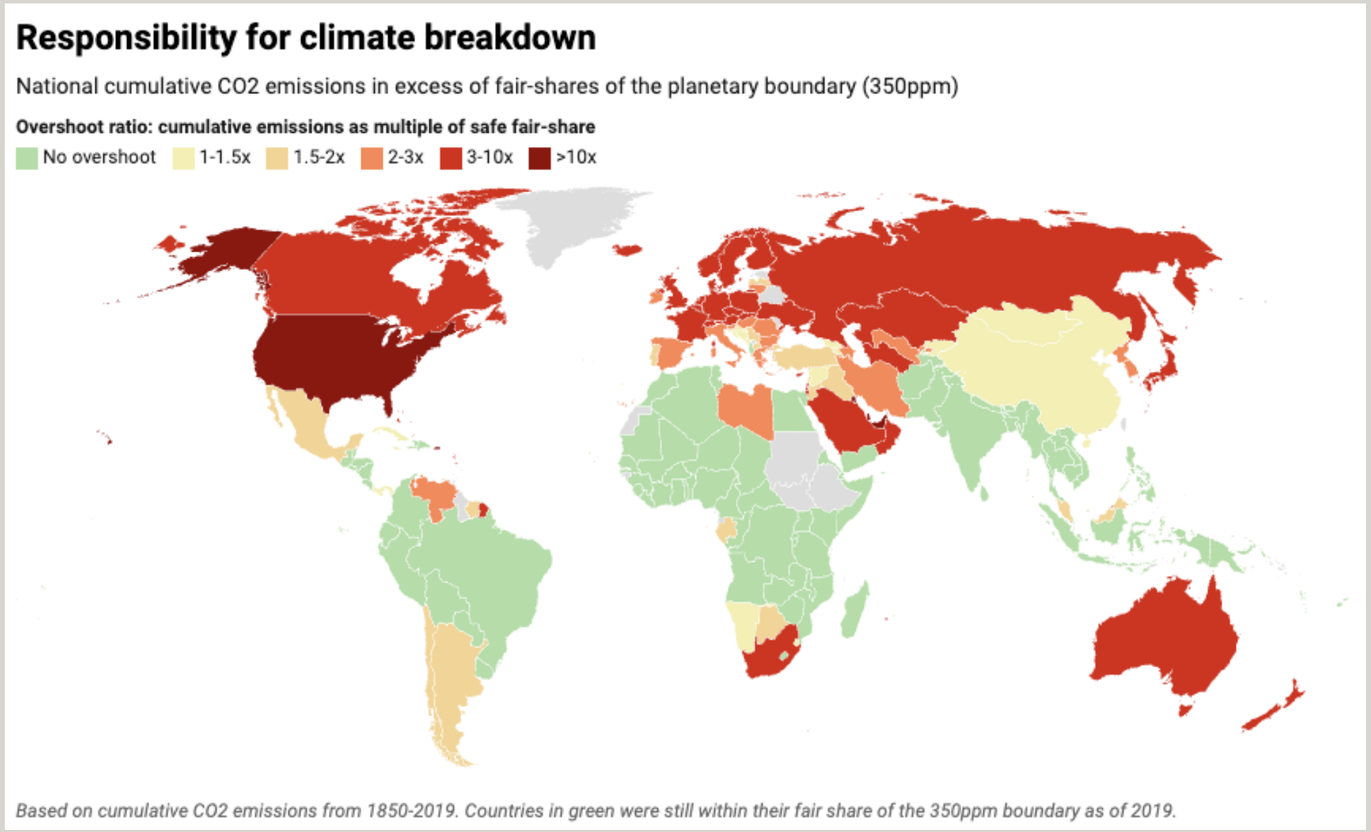
Figure 8.6 in Birkmann, J., E. Liwenga, R. Pandey, E. Boyd, R. Djalante, F. Gemenne, W. Leal Filho, P.F. Pinho, L. Stringer, and D. Wrathall, 2022: Poverty, Livelihoods and Sustainable Development. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 1171–1274, doi:10.1017/9781009325844.010.

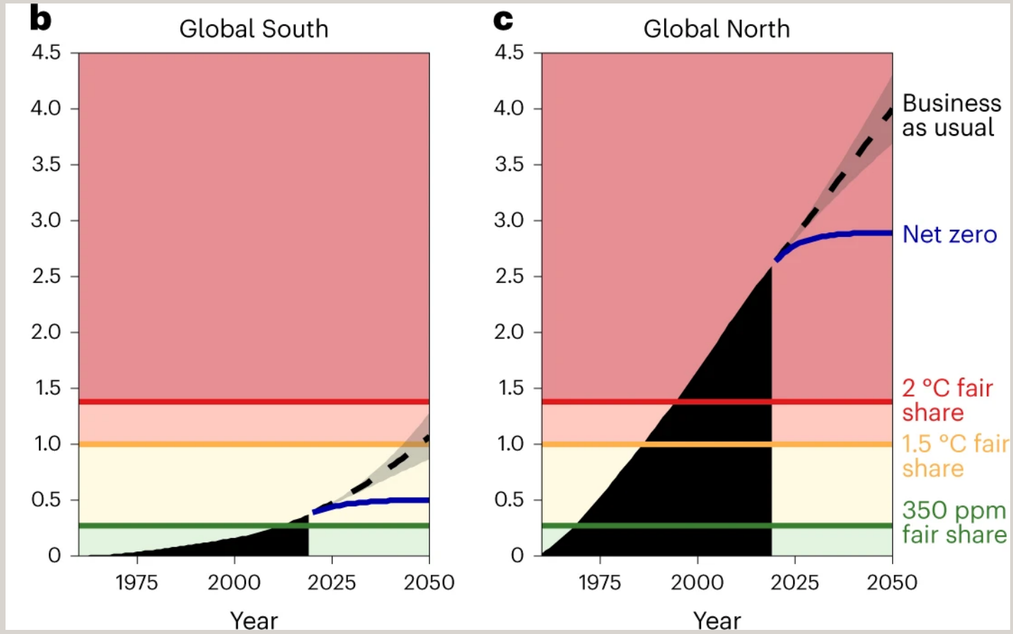


Global opvarmning på 2,7 grader kan efterlade en tredjedel af verdens befolkning udenfor den "menneskelige klimaniche" (cirka en femdobling relativt til 1,5 grader)

Lenton, T.M., Xu, C., Abrams, J.F. et al. Quantifying the human cost of global warming. Nat Sustain (2023).

Historisk ansvar for konsekvenserne

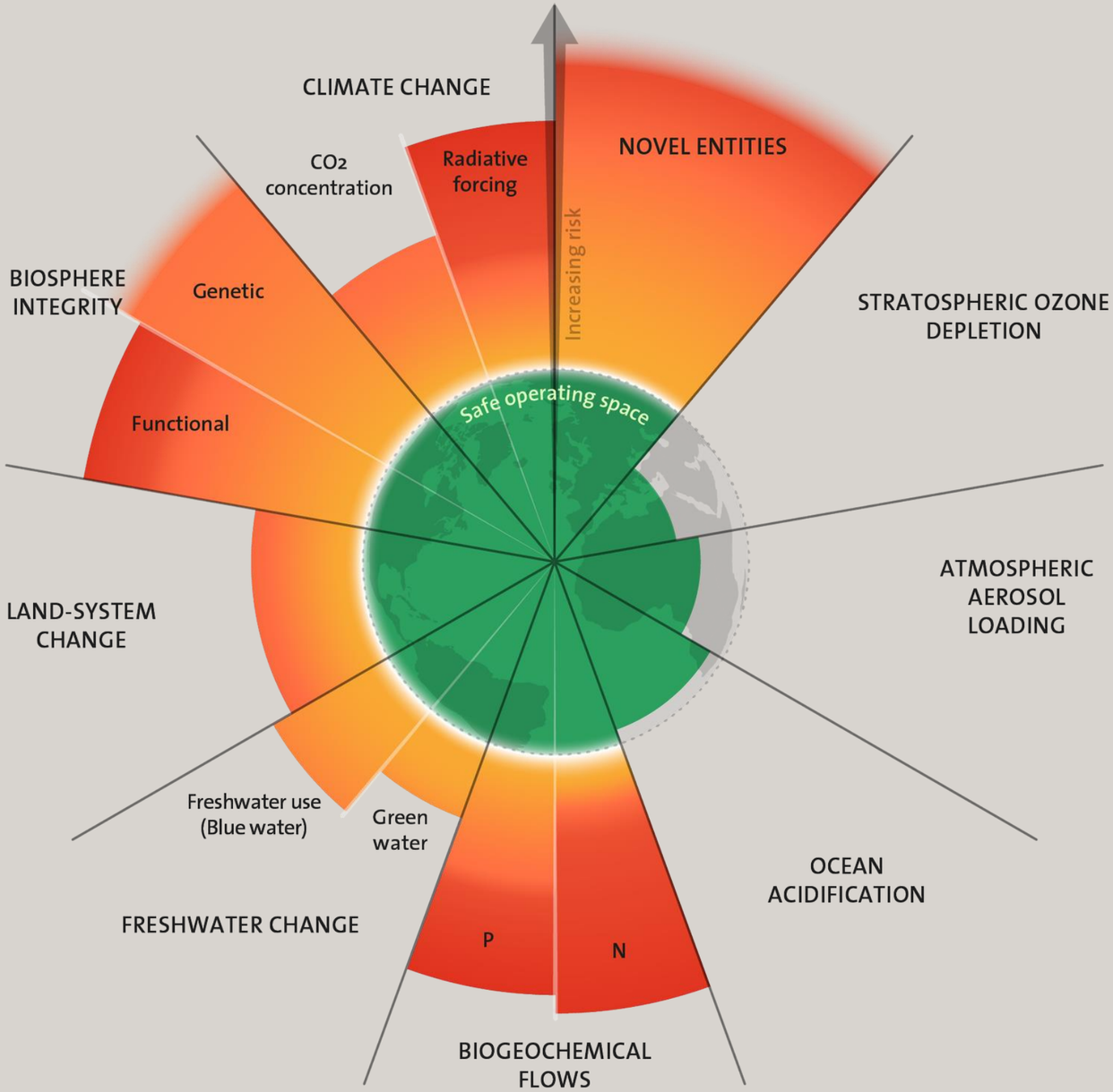




Fanning, A.L., Hickel, J. Compensation for atmospheric appropriation. Nat Sustain (2023)

Sammenhænge til andre problemer

1. Klimaforandringer relaterer til, drives af og forstærker andre miljøproblemer
2. En samlet ramme til at måle problemerne er de såkaldte planetære grænser



Source: Azote for Stockholm Resilience Centre, based on analysis in Richardson et al 2023

DK 2015

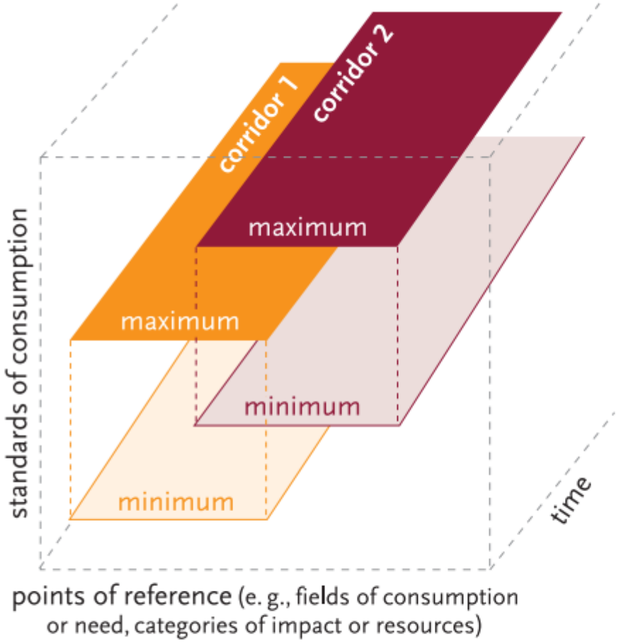
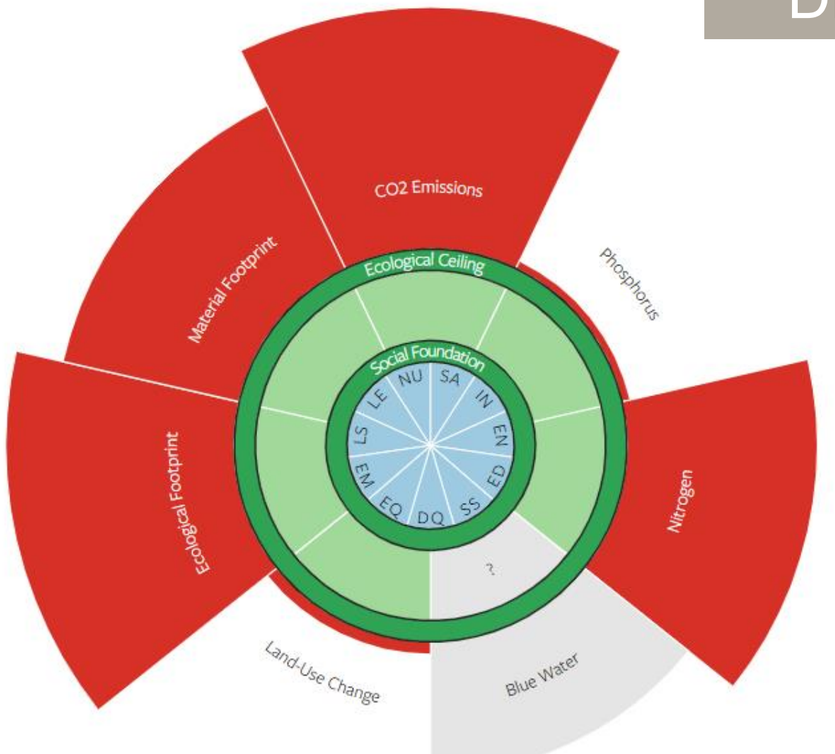


FIGURE 3: Corridors of sustainable consumption are defined by minimal and maximal standards of consumption. Their number and the degree of overlap depends on how many points of reference (fields of consumption, environmental and social impact categories, etc.) will prove to be reasonable and on how much these will be disjoint. The corridors will have to be readjusted peri

GAIA 23/S1 (2014): 184–192 | doi: 10.14512/gaia.23.S1.6



Det er afgørende at vurdere tiltag mod klimaforandringer i relation til deres konsekvenser for andre planetære grænser

Di Giulio, Antonietta; Fuchs, Doris. Sustainable Consumption Corridors: Concept, Objections, and Responses. GAIA 23/S1(2014): 184 –192

Hovedpointer

1. Konsekvenser på tværs af økosystemer, domæner, regioner, etc.
    a. Tilpasning er vigtigt men kan ikke fjerne konsekvenserne
2. Temperaturstigning altafgørende for konsekvenser: “Every small increase in warming will result in increased risks”
3. Store geografiske uligheder i klimaforandringernes konsekvenser og ansvar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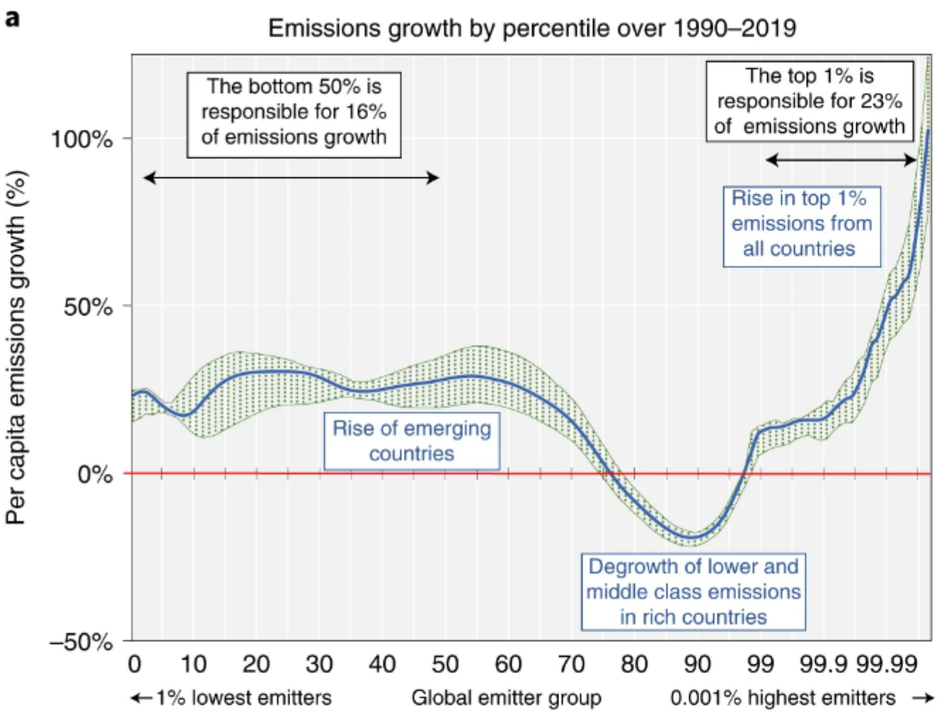
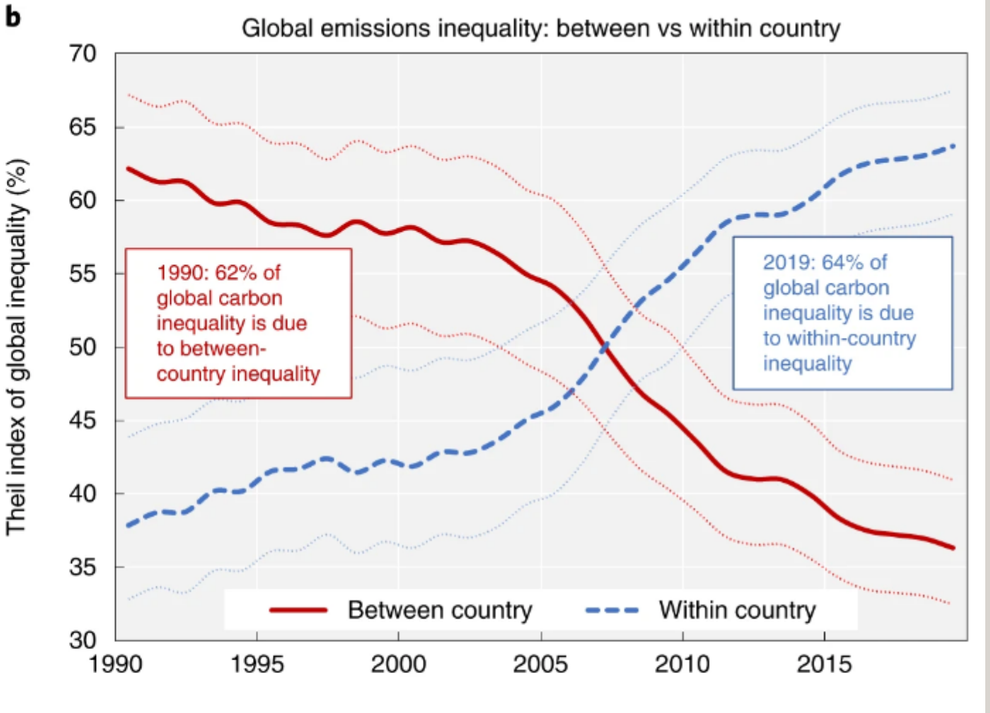
APPENDIX

Global udvikling over tid





Personal carbon footprints include emissions from domestic consumption, public and private investments, as well as imports and exports of carbon embedded in goods and services traded with the rest of the world. Modelled estimates are based on the systematic combination of tax data, household surveys and input-output tables. Benchmark scenario. Emissions are split equally within households. **a**, Growth in emissions by global emitter group over 1990–2019. Dotted area represents upper and lower bounds from our range of extreme scenarios. **b**, Global emissions inequality between vs within countries. Dotted lines represent scenarios with $\alpha = 0.4$ and $\alpha = 0.8$. Source and series: Author, see Methods and Supplementary Information sections 5–7.

Chancel, L. Global carbon inequality over 1990–2019. Nat Sustain (2022). https://doi.org/10.1038/s41893-022-00955-z