



Global
Food Security



Sustainable, healthy food for all

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“sustainable intensification”

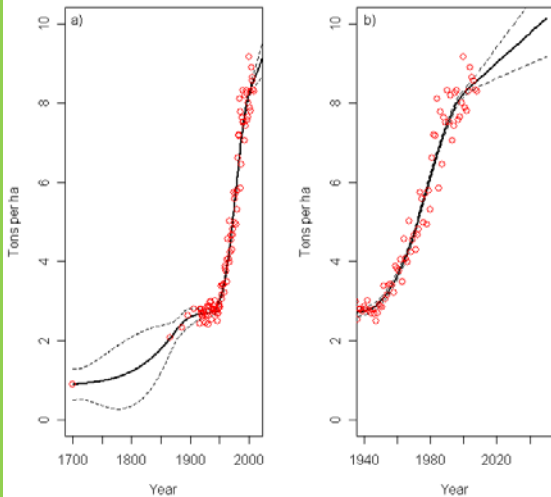


Fig 1. Time series data on wheat yields per ha for an area in Scotland, dating back to 1700. The data are the red points, with a “smoother” (a spline curve, with smoothness fitted using cross-validation) shown in black, with the standard error of the fit being shown by dotted lines). (a) shows the whole time series, (b) shows from 1940 onwards, with the smoother projected forwards to 2050. Since about 1985, the rate of annual increase in yield has declined.

- Productivity growth important given demand
 - What sort of productivity?
 - Economic growth a public good
- But trade-off with “sustainability”
 - Implies a trade-off between production now vs production tomorrow
- Trade-off implies optimisation not maximisation
 - But who decides? /Implements



Issues around metrics of SI



- limits and thresholds

- Malthus, local, planetary boundaries, bio

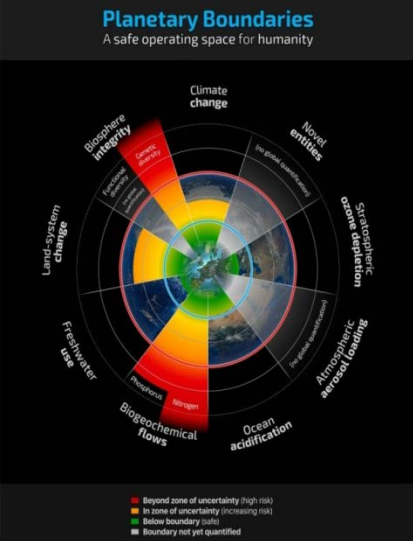
- Non-li

- .../precaution

- ... availability

Perverse outcomes: Borlaug vs Jevons; land sparing vs sharing

Is perfect the enemy of the good or is imperfect a recipe for unintended outcomes?





Issues (2)



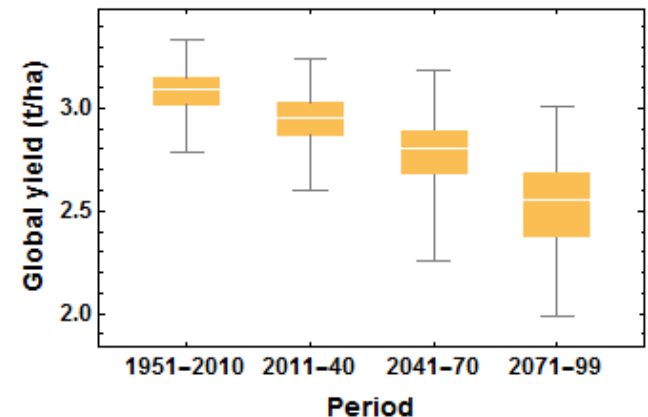
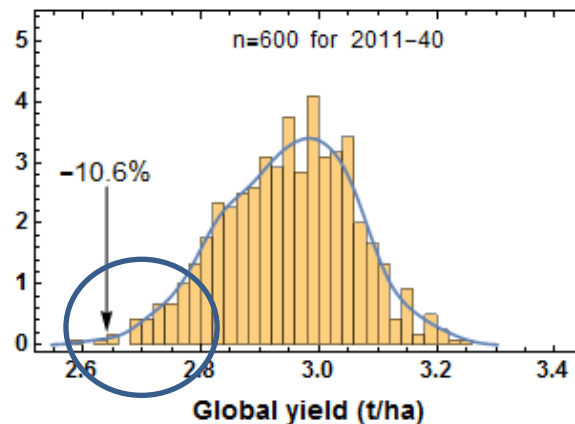
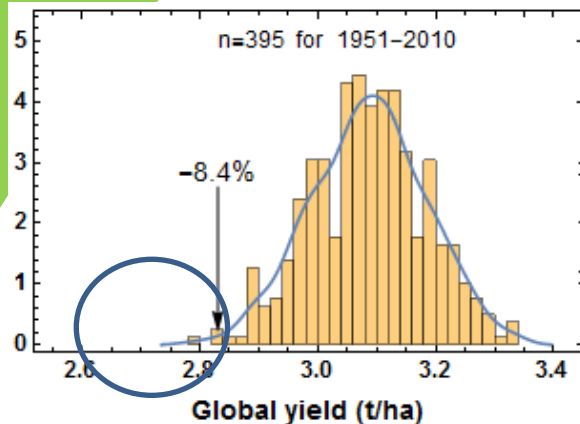
- Spatial scale
 - Farm/landscape/region/country/global
- Temporal scale
 - Annual = BAU
 - Long-term=license to ignore



Climate change vs weather



- Changes in climate and changes in weather not necessarily the same



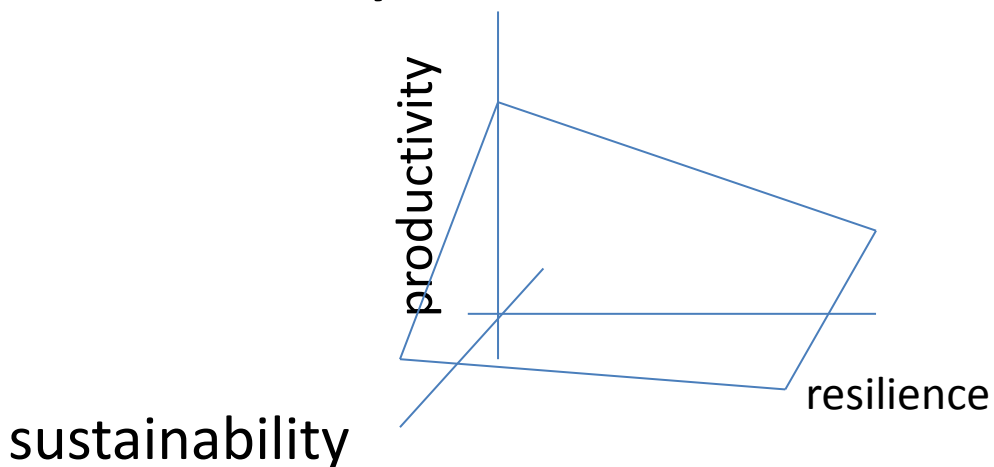
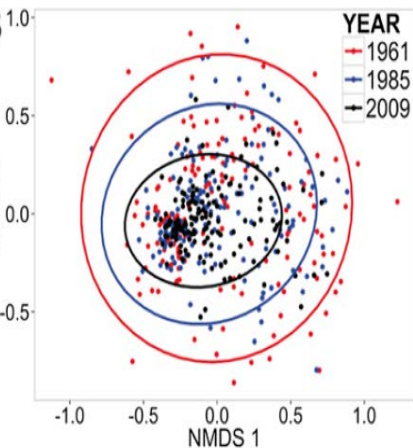
(courtesy Joshua Elliott/Chicago not for quoting)



Sustainability and resilience



- Productivity drives uniformity
- In a changing world BOTH sustainability and resilience important
- Three way trade off:





Thank you!

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