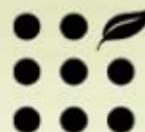


Land Quality, Agricultural Productivity, and Food Security

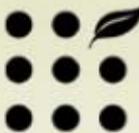
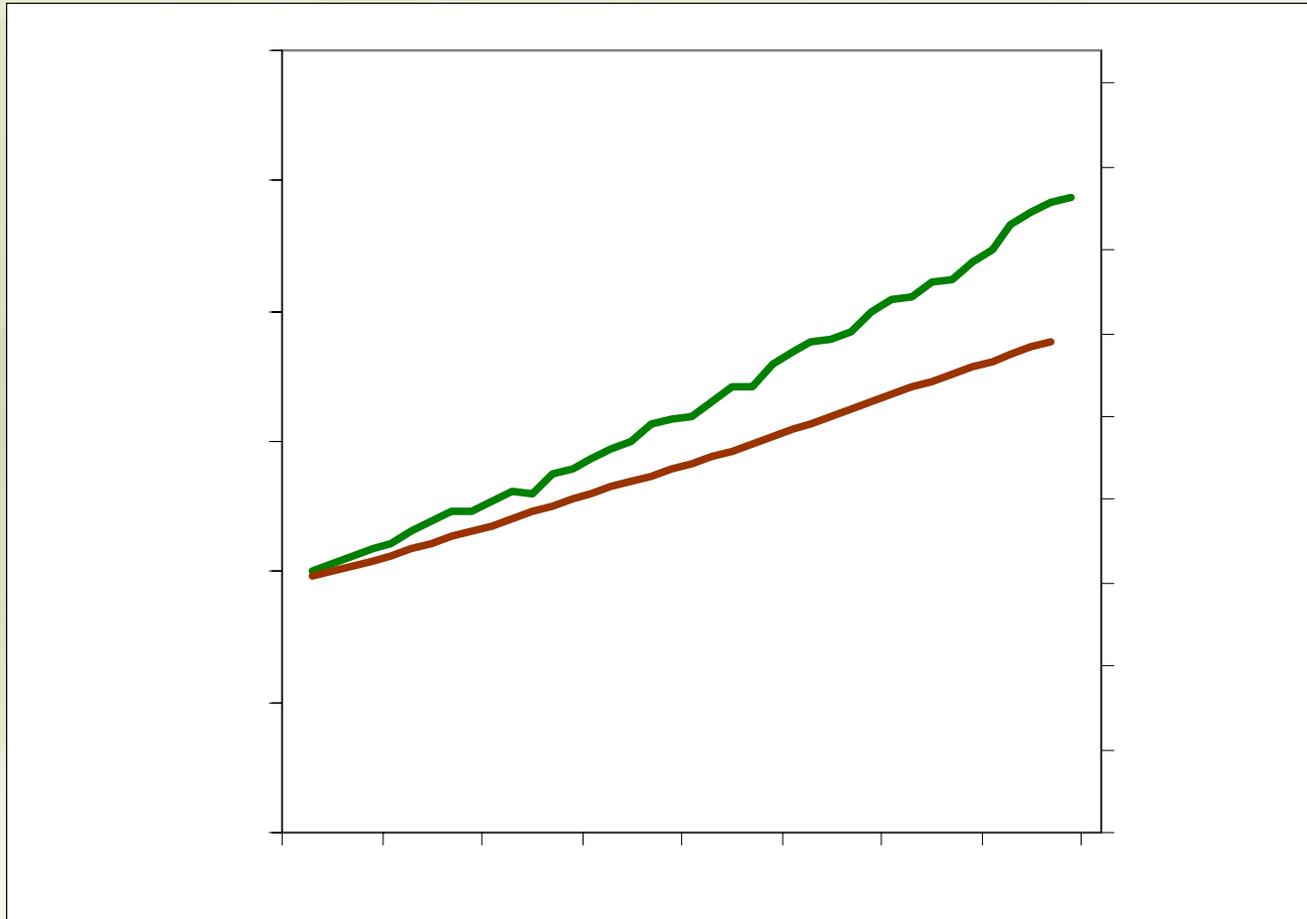
Biophysical Processes and Economic Choices

Keith Wiebe
USDA Economic Research Service

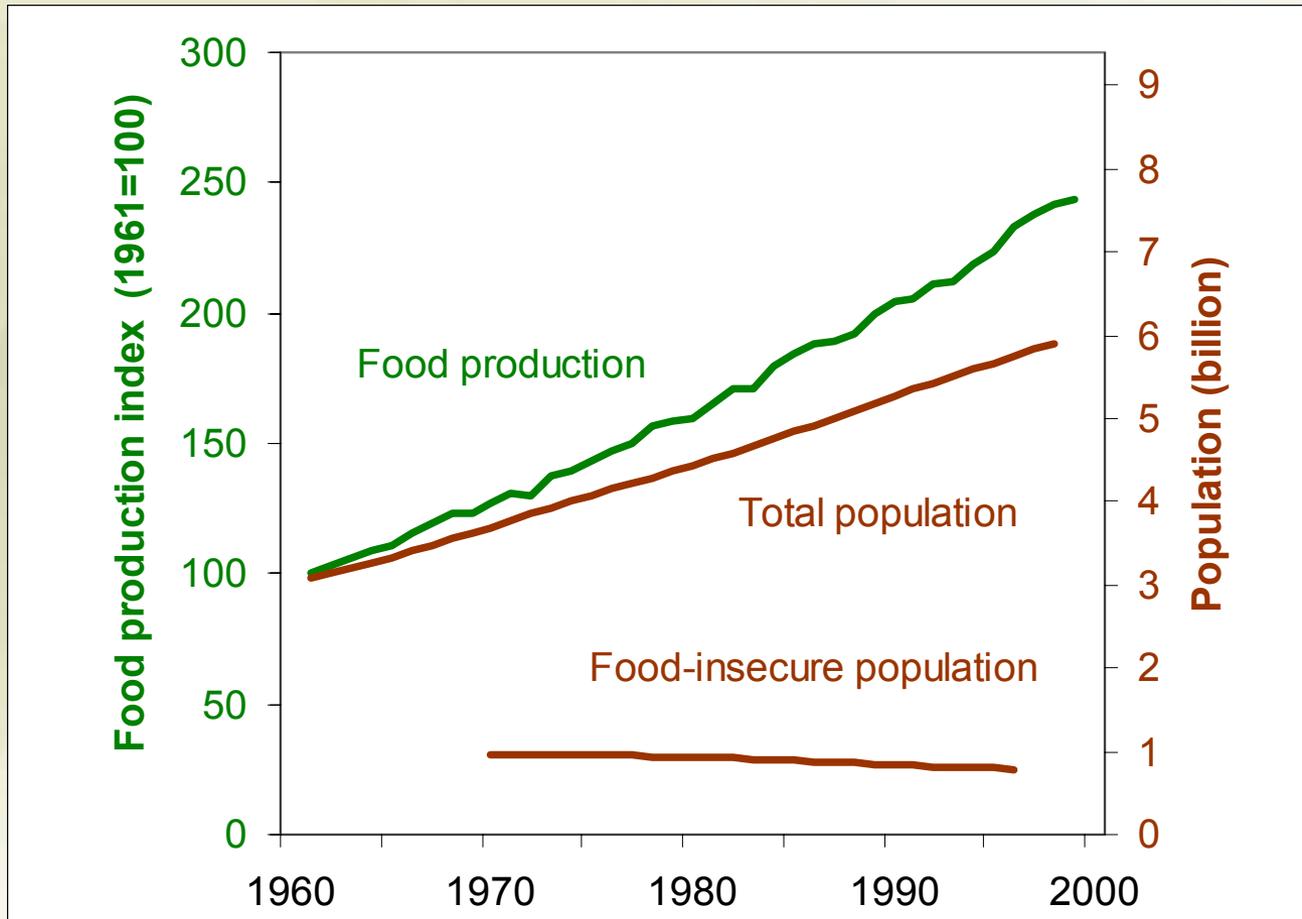
Agricultural Outlook Forum
Arlington, Virginia, 19 February 2004



Malthus warned that population would outpace food production



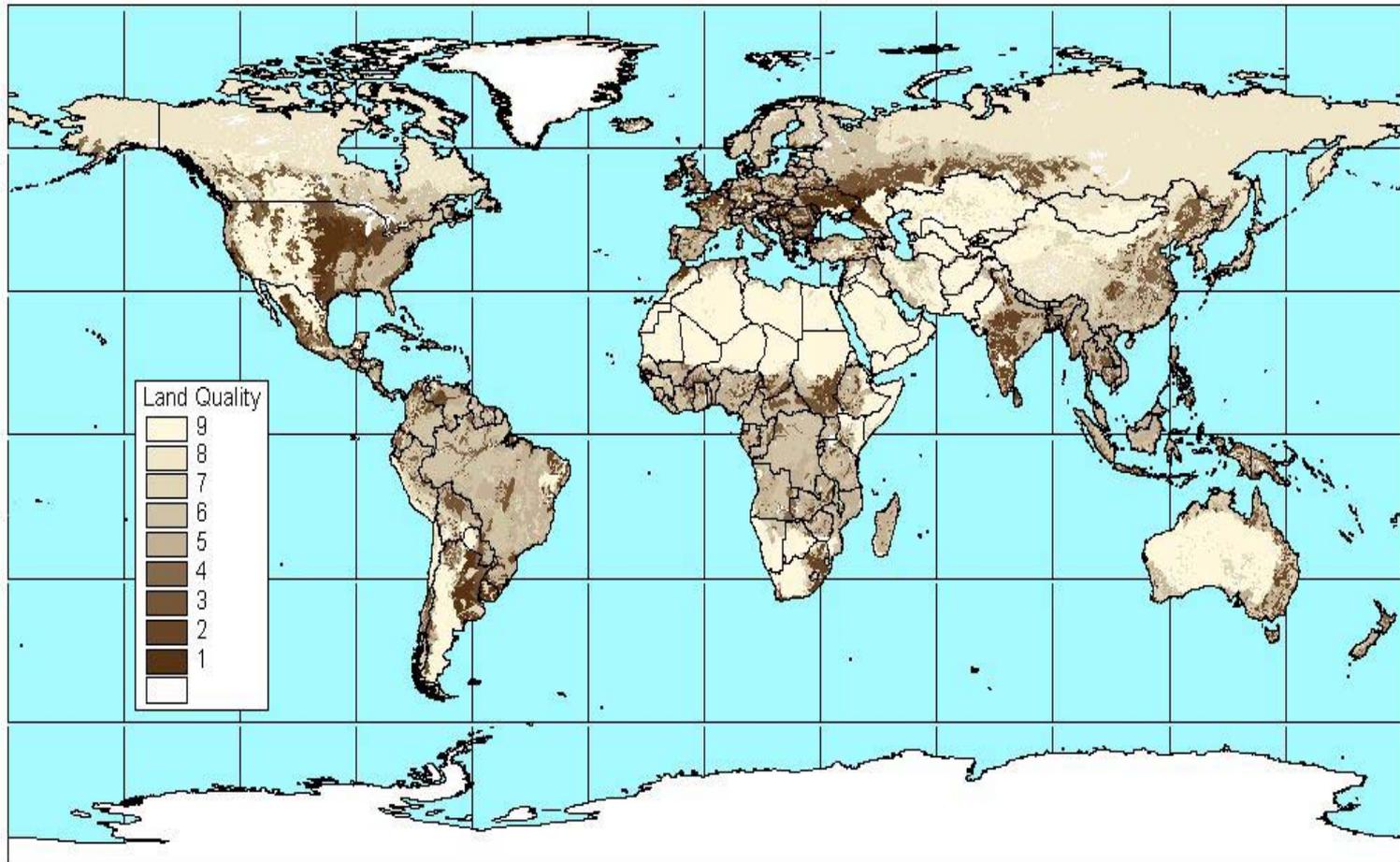
But the data show otherwise--so far



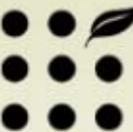
Source: FAO data



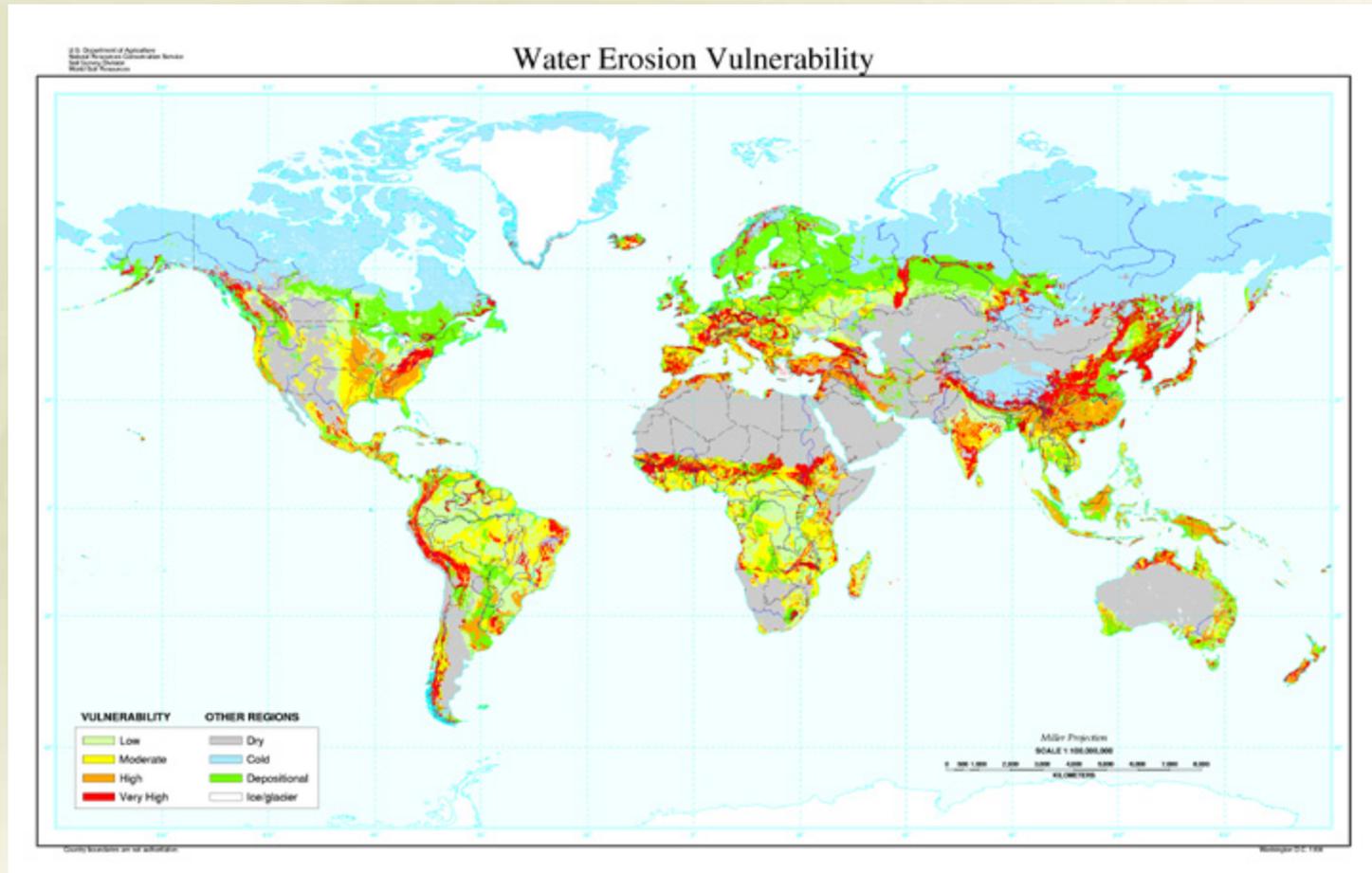
Land quality classes



Source: USDA Natural Resources Conservation Service, World Soil Resources Office



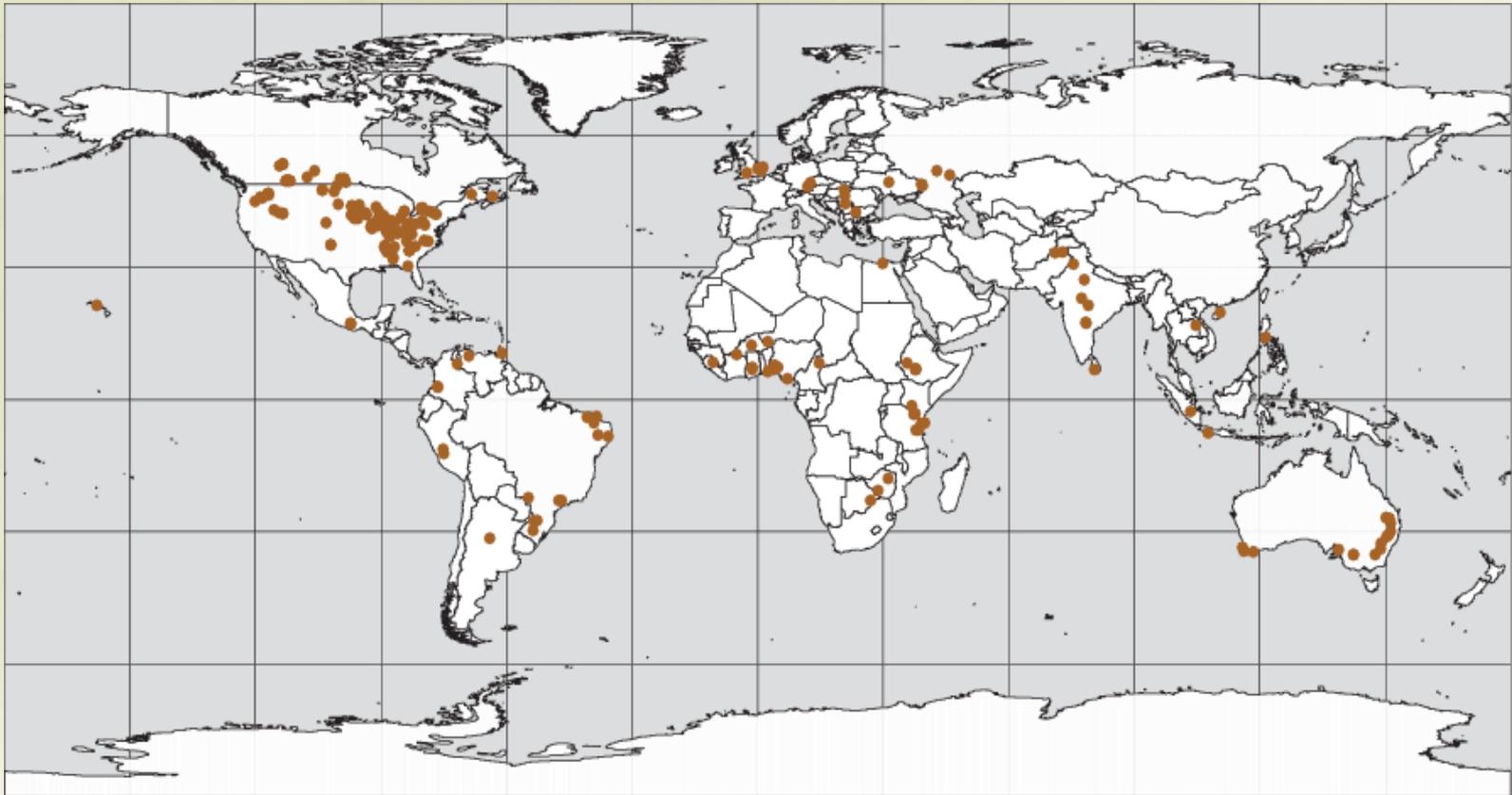
Vulnerability to erosion by water



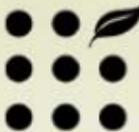
Source: USDA Natural Resources Conservation Service, World Soil Resources Office



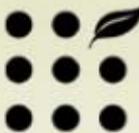
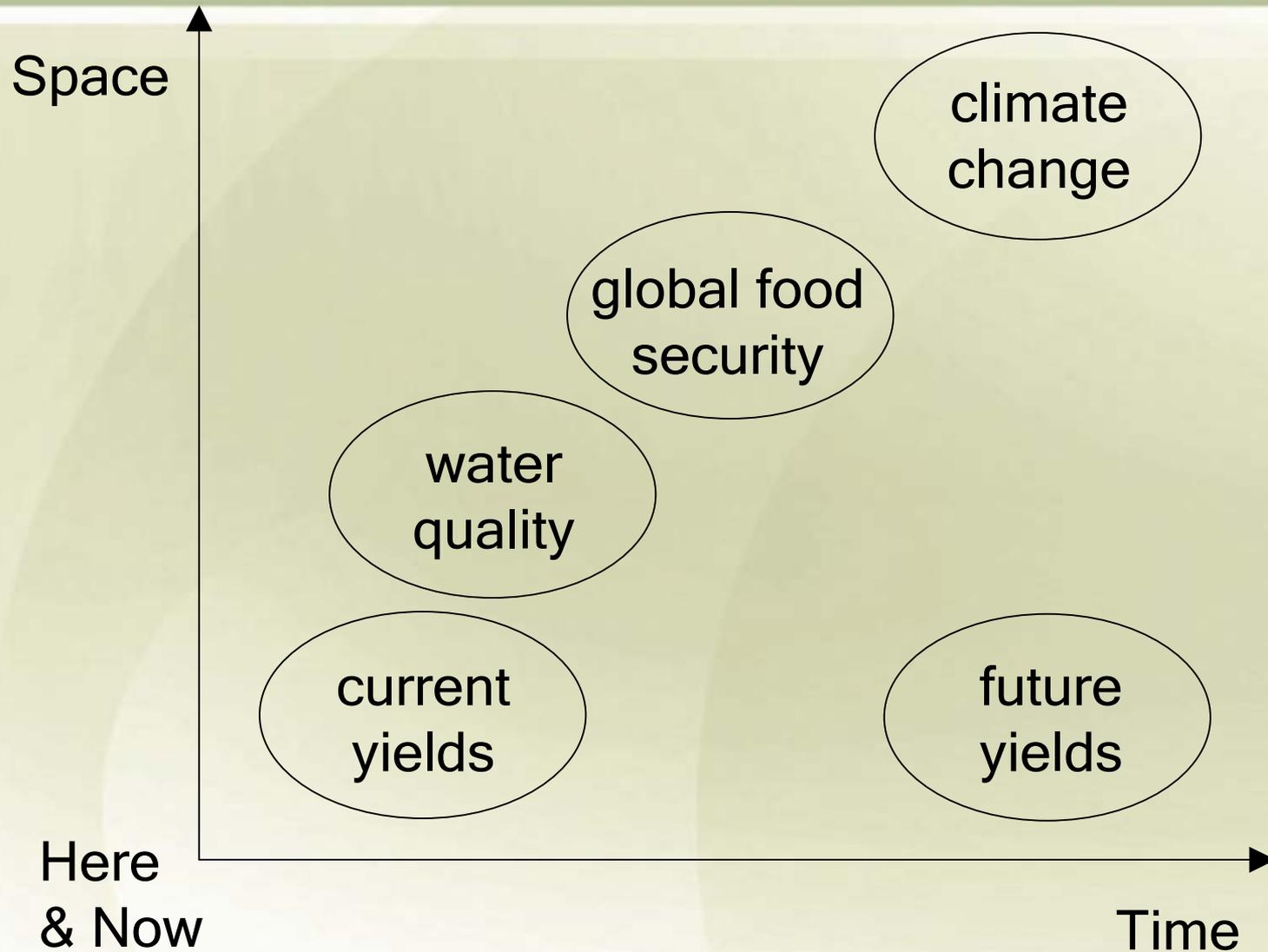
Erosion-productivity study sites



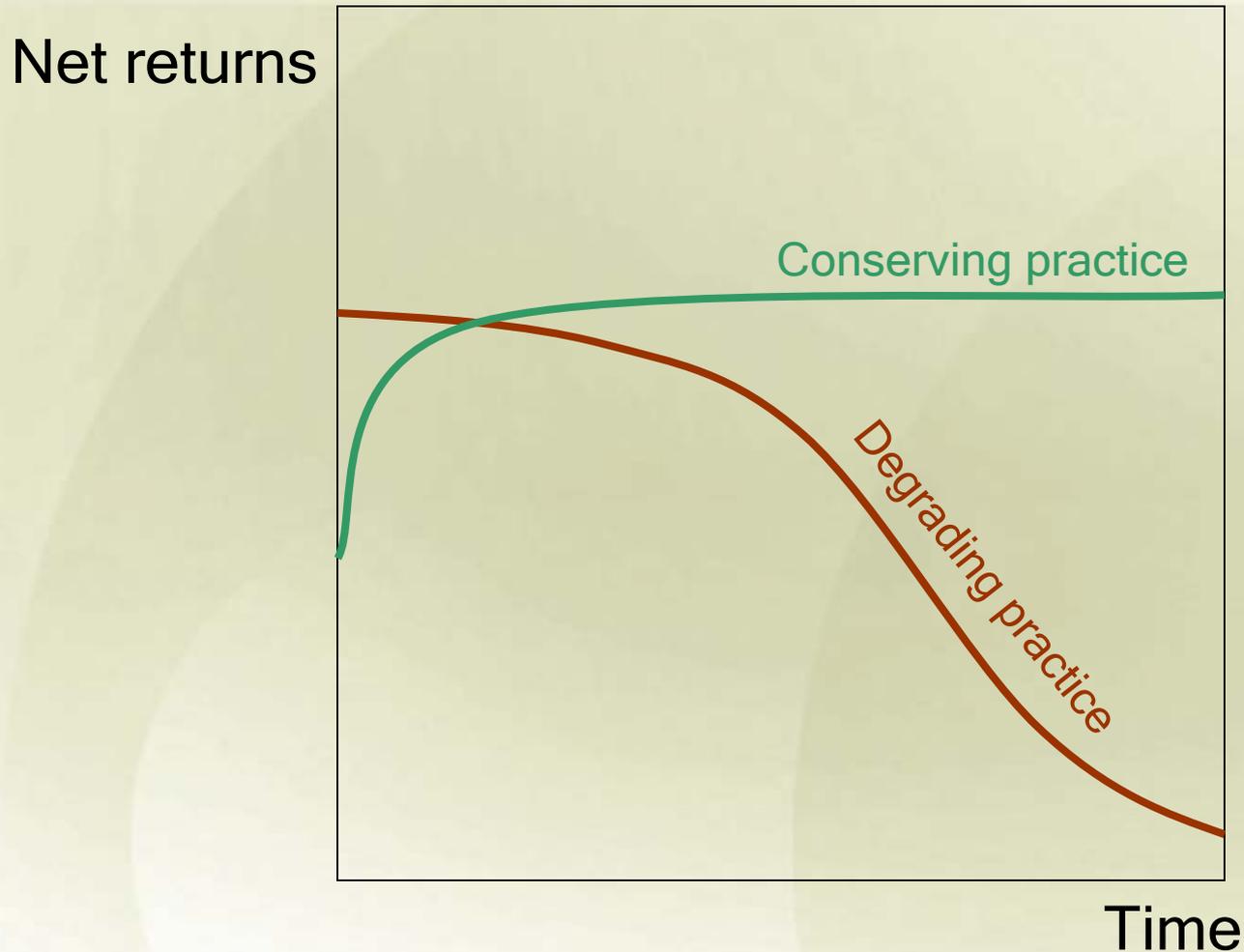
Source: Den Biggelaar et al.



Distance affects incentives and decisions



Net returns to alternative practices



Source: Pagiola



Yields at different rates of land degradation

Yields

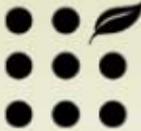


zero losses

0.3 %/year

potential losses

Time



Yields at different rates of land degradation

Yields



} 0.1 %/year
} 0.3 %/year

Time



Yields at different rates of land degradation

Yields



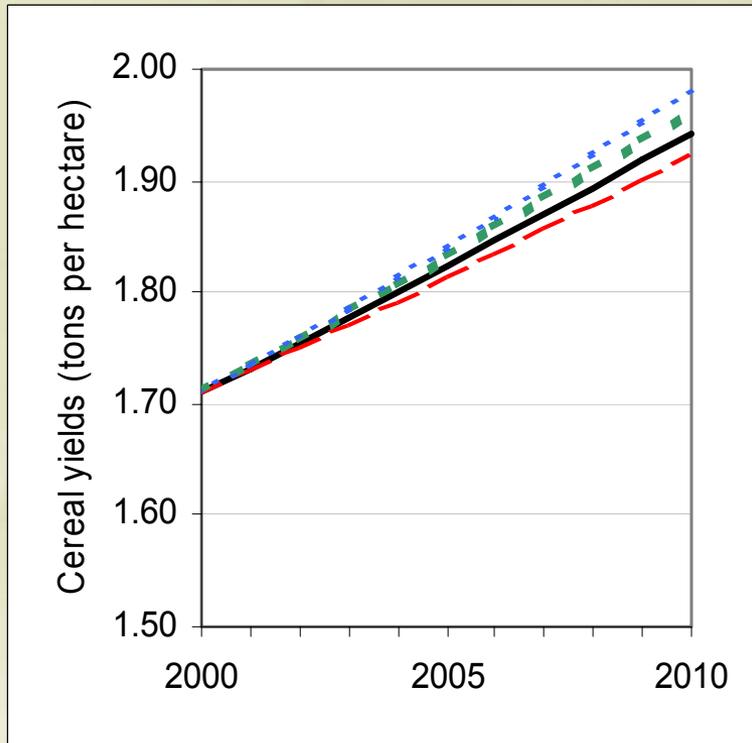
} 0.1 %/year
} 0.3 %/year

Time

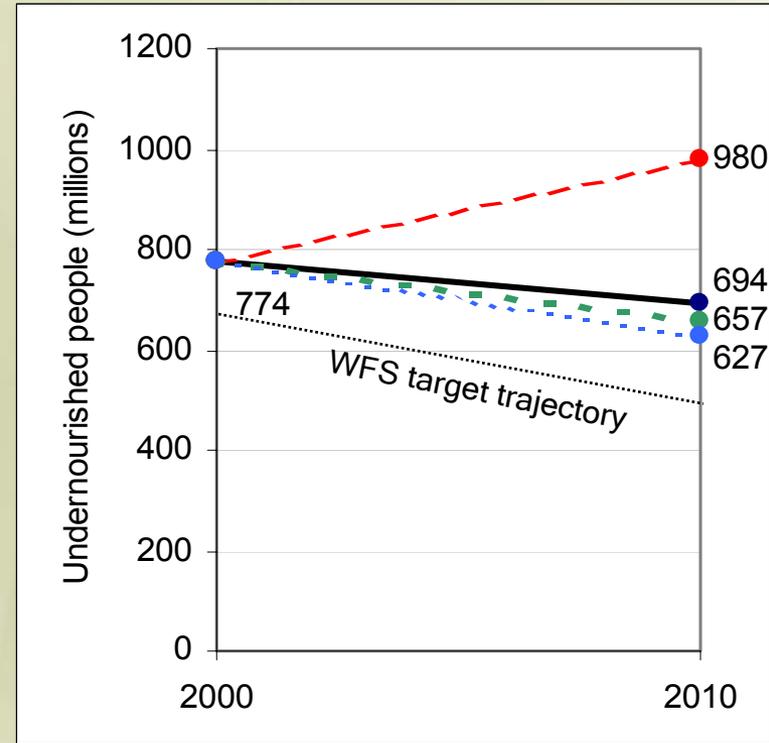


Impacts on low-income developing countries under alternative scenarios

Cereal yields



Undernourished people



Source: Economic Research Service, USDA

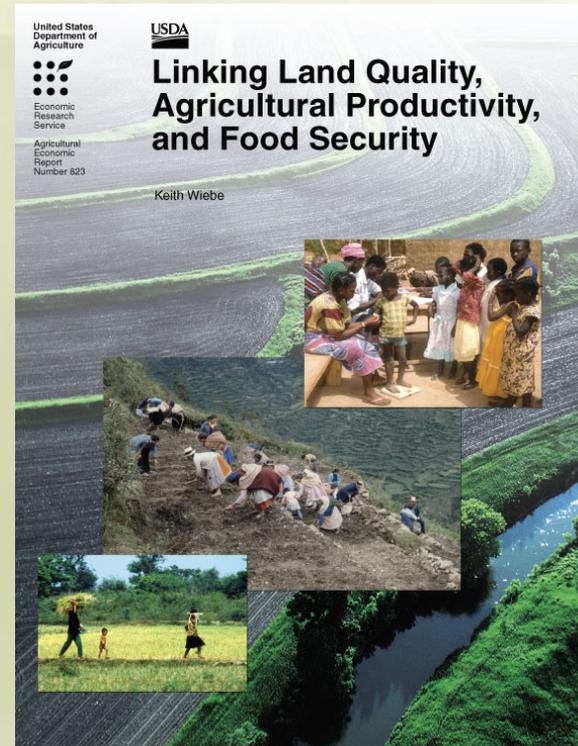
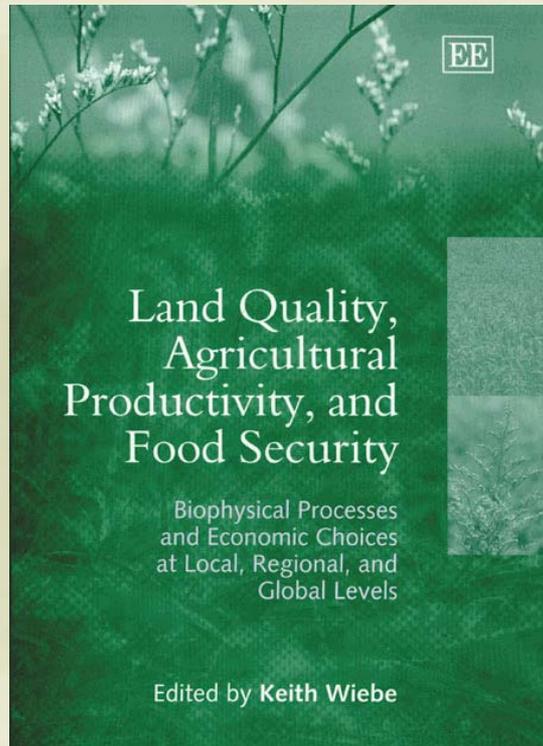


Conclusions

- Land degradation's productivity impacts at the lower range of previous estimates
- Farmers' responses are critical, and vary with biophysical and economic conditions
- Reducing yield losses to degradation would reduce hunger, but not enough to meet World Food Summit goals



For more information...



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