



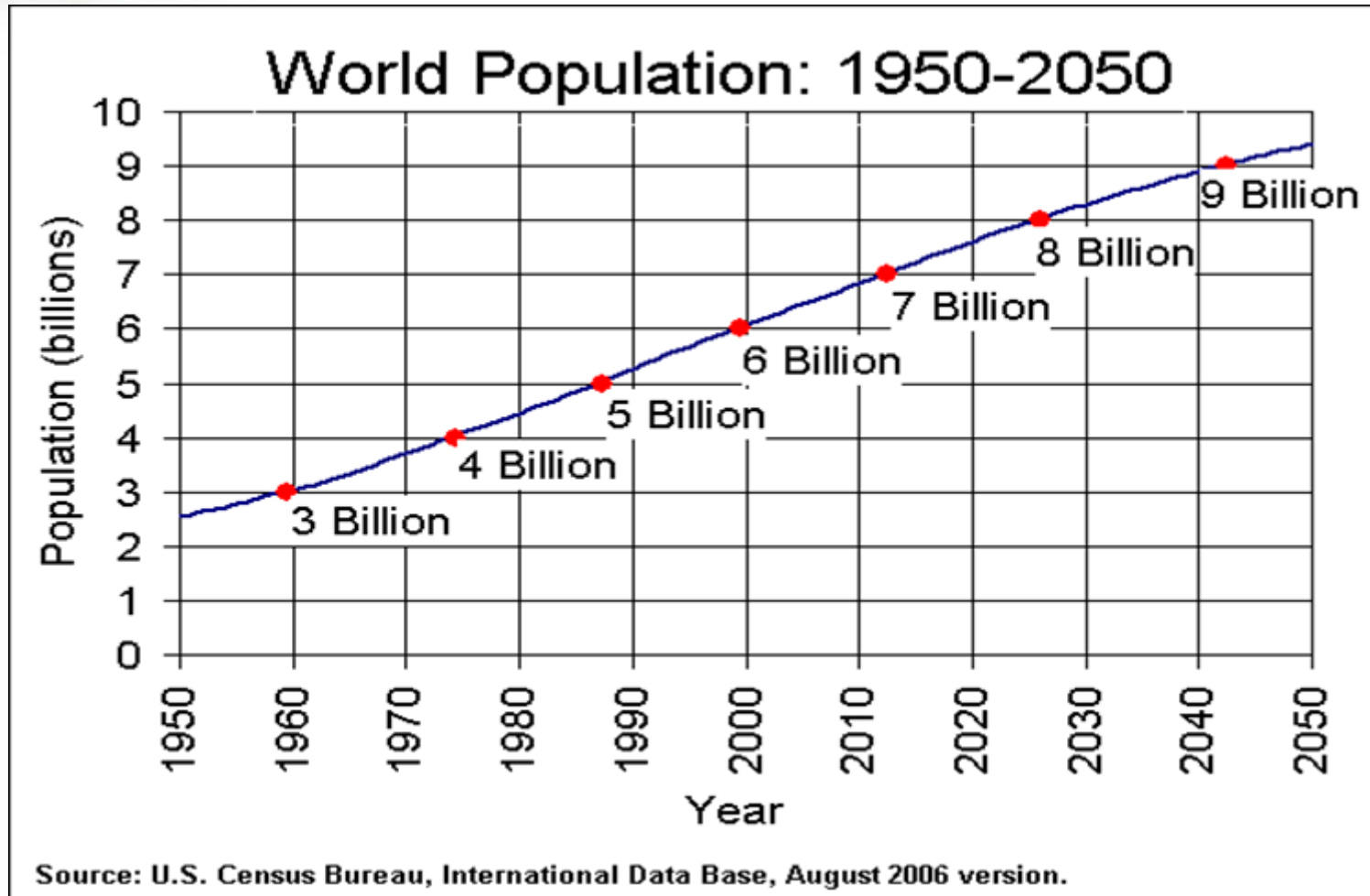
The Coming Famine:

the risks to global food security

Adj. Prof. Julian Cribb FTSE
Julian Cribb & Associates
Sydney, October 21 2009

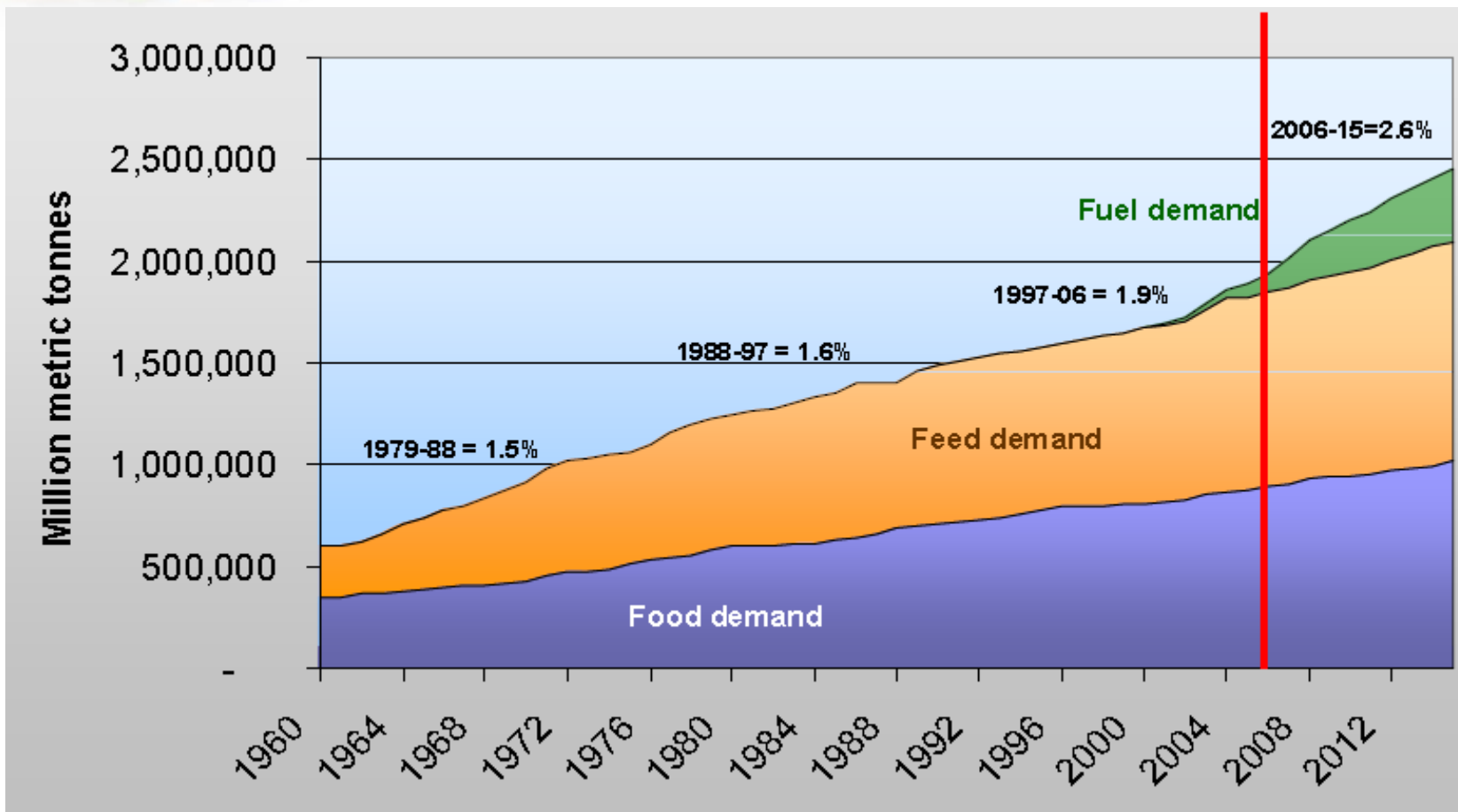


Rising human numbers



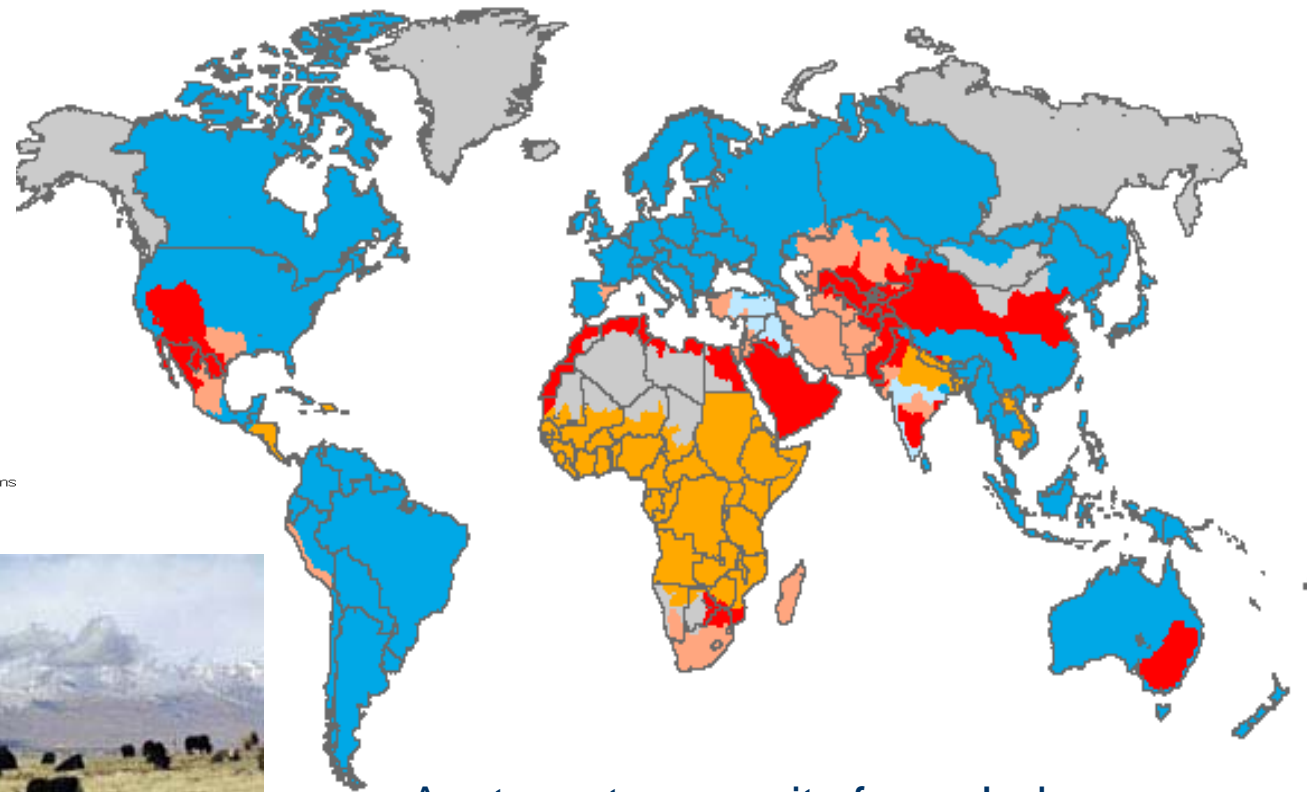
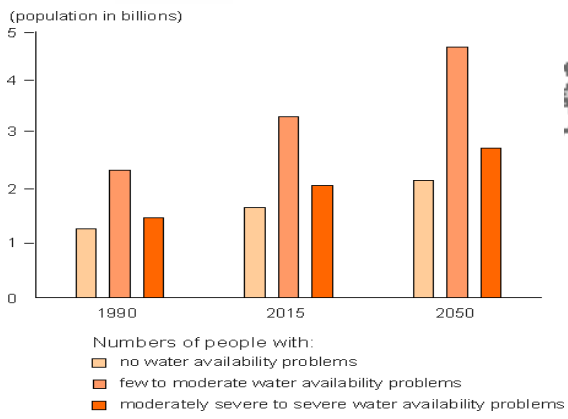


Rising food demand





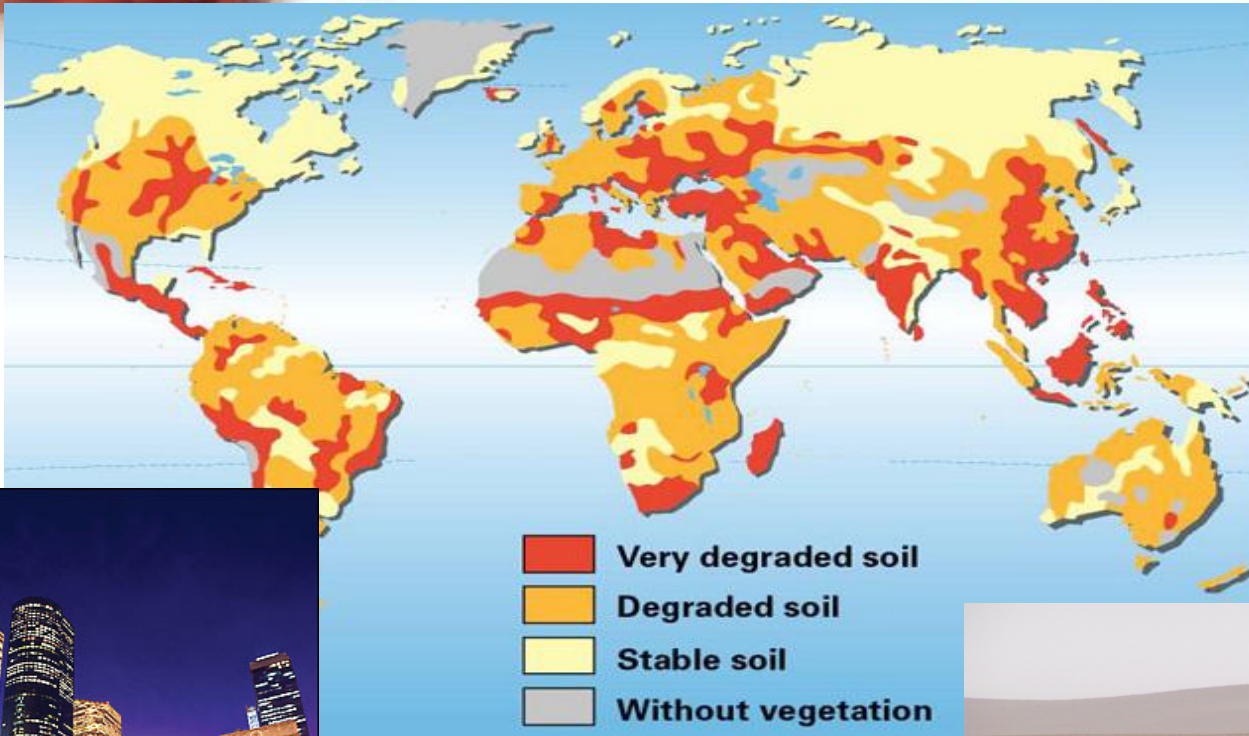
Water scarcity



Acute water scarcity faces Indo-Gangetic plain, N China Plain, Central Asia, ME, North Africa, SW America, SE Aust.



Land scarcity



25% of soils degraded ▲

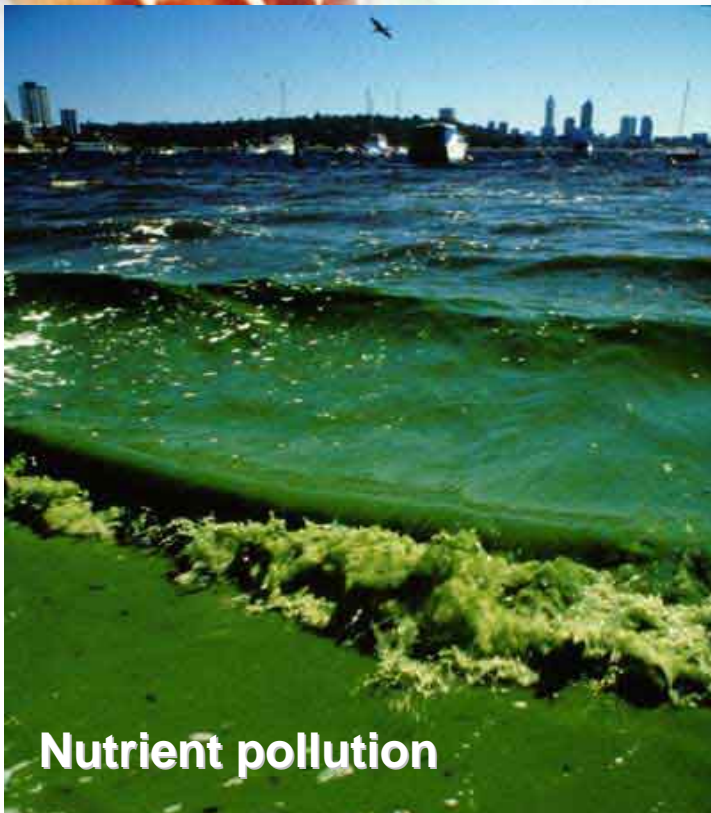
Desertification ►

◀ Urban annexation

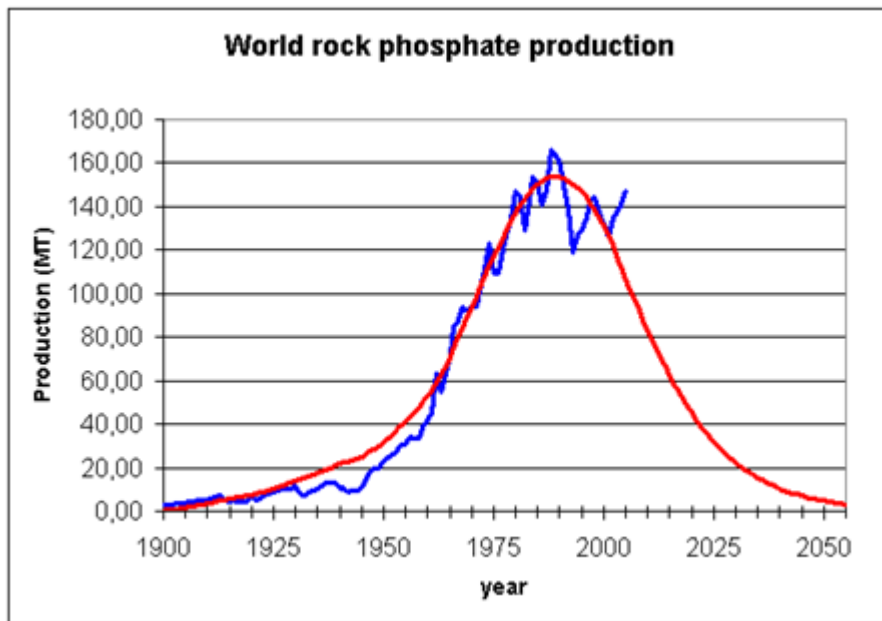




Nutrient scarcity

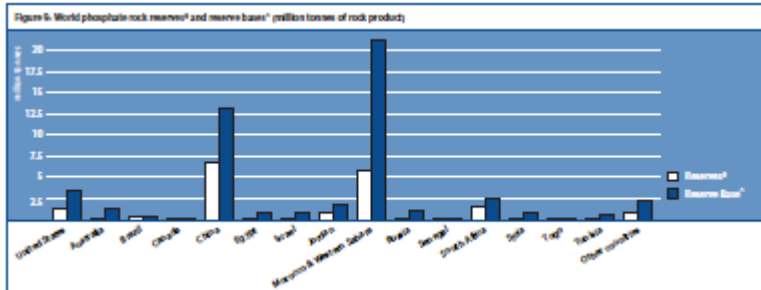


Nutrient pollution



Peak phosphorus ▲

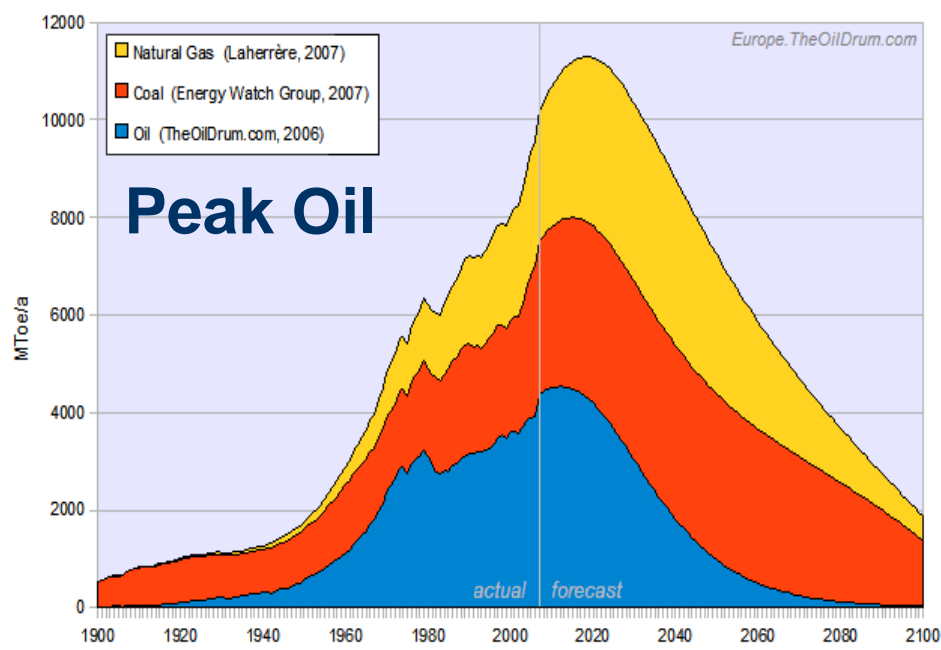
◀ World reserves



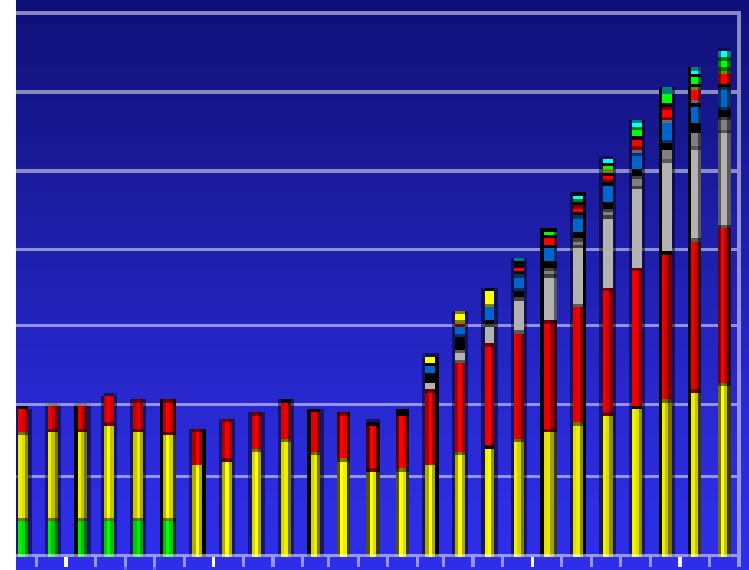


Energy scarcity

Conventional Fossil Fuels



Ethanol Production
mln litres



Peak oil ▲

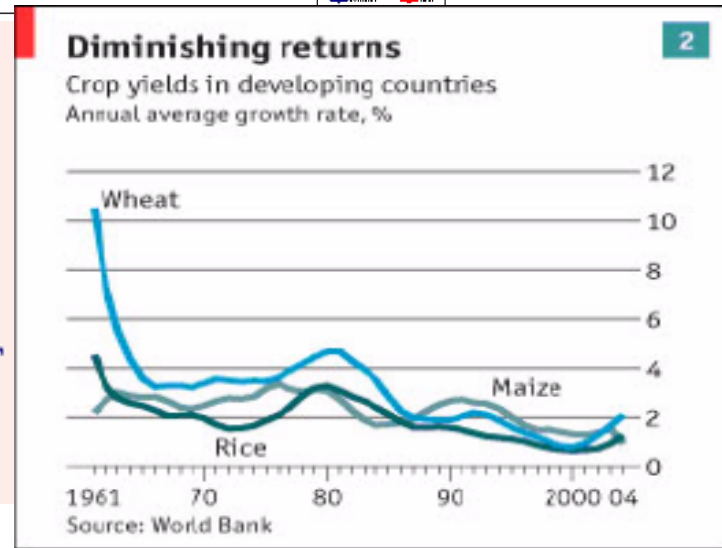
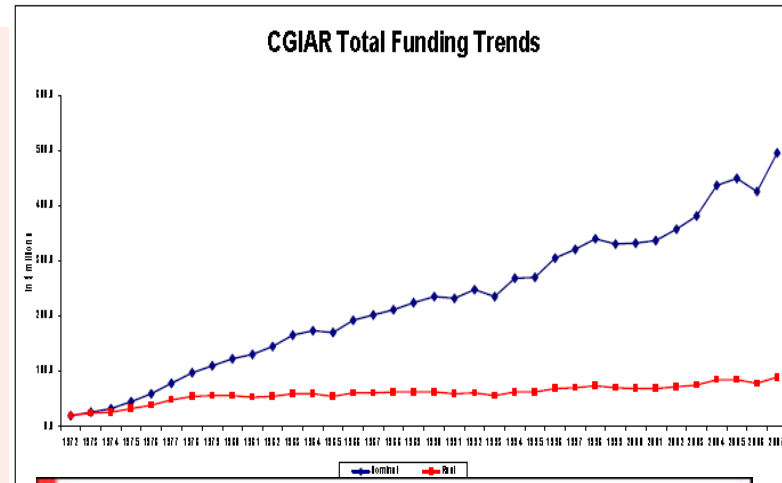
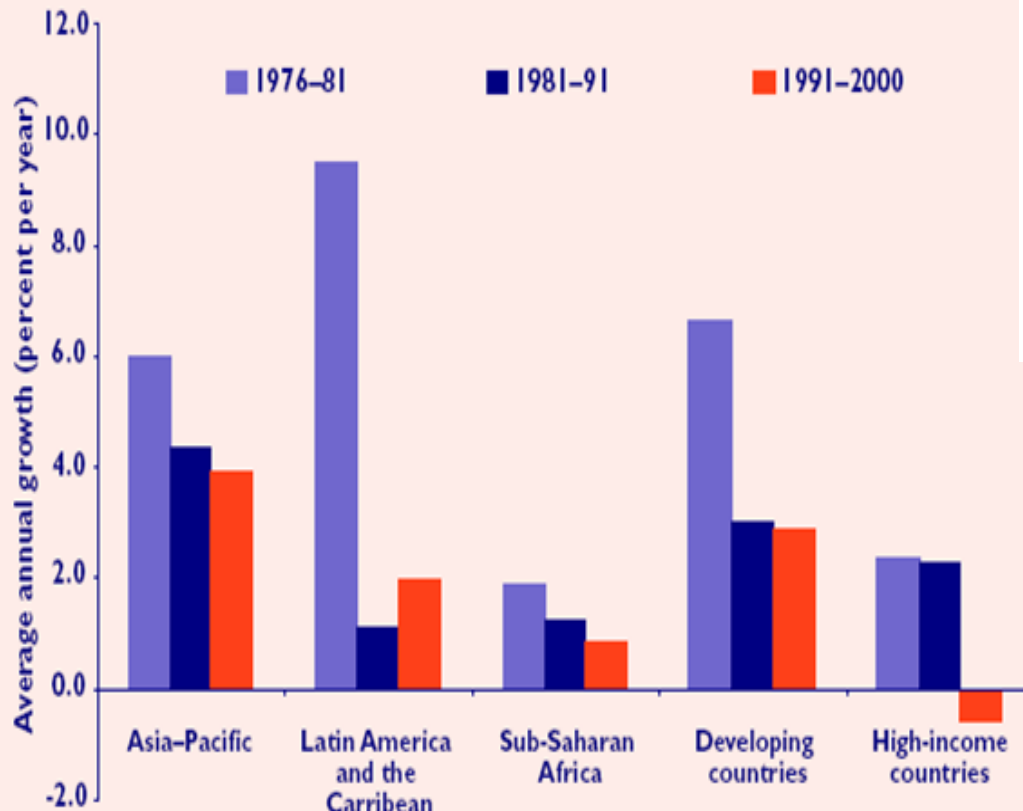
Biofuels impact ►





Knowledge drought

Figure 1 Public agricultural R&D spending trends





Fisheries collapse?



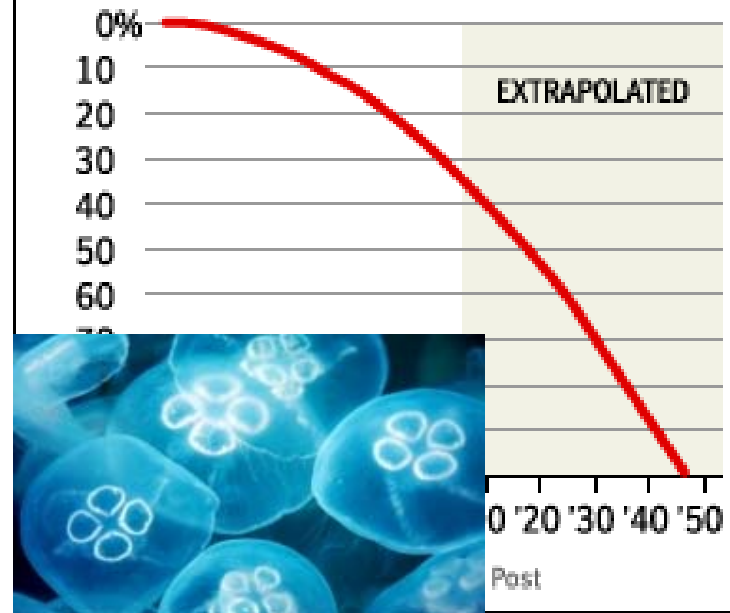
“The maximum wild capture fishery potential from the world’s oceans has probably been reached .”

- FAO

Fisheries' Downfall

If current fishing trends continue, all of the commercial fisheries will have collapsed by 2050, according to a peer-reviewed study.

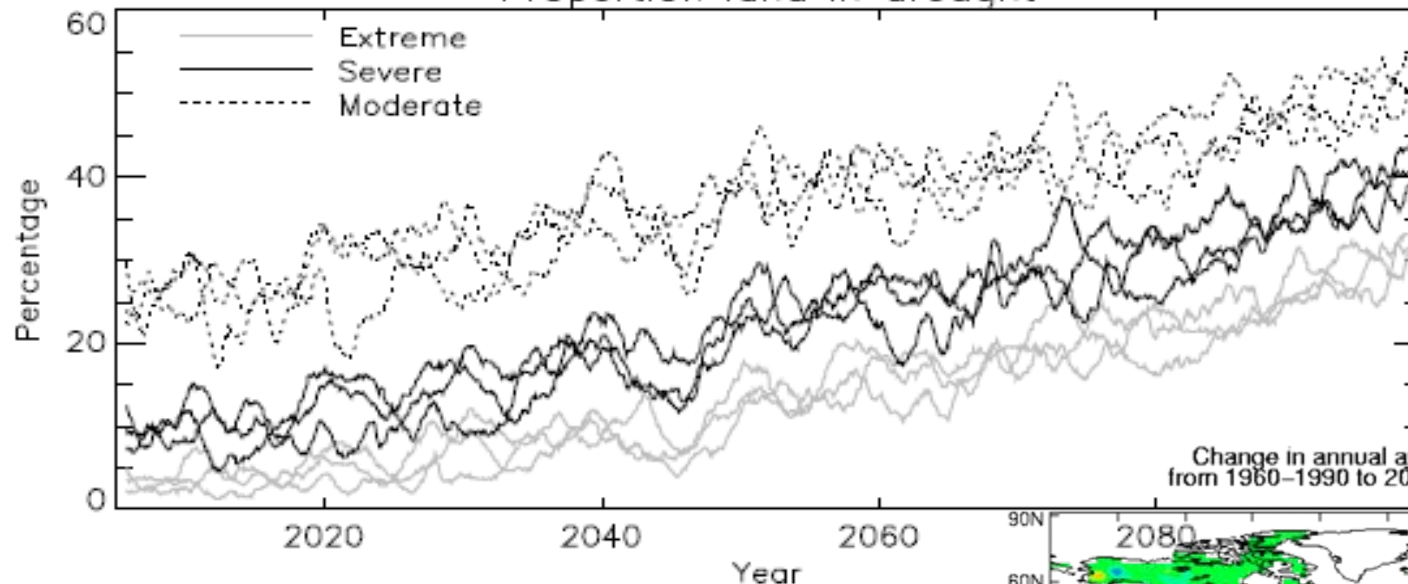
Percentage of fisheries collapsed





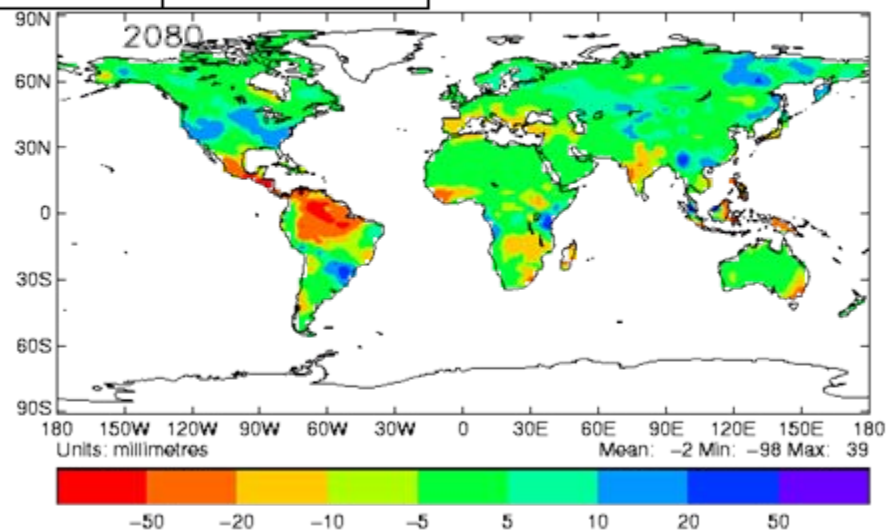
A world of drought

Proportion land in drought



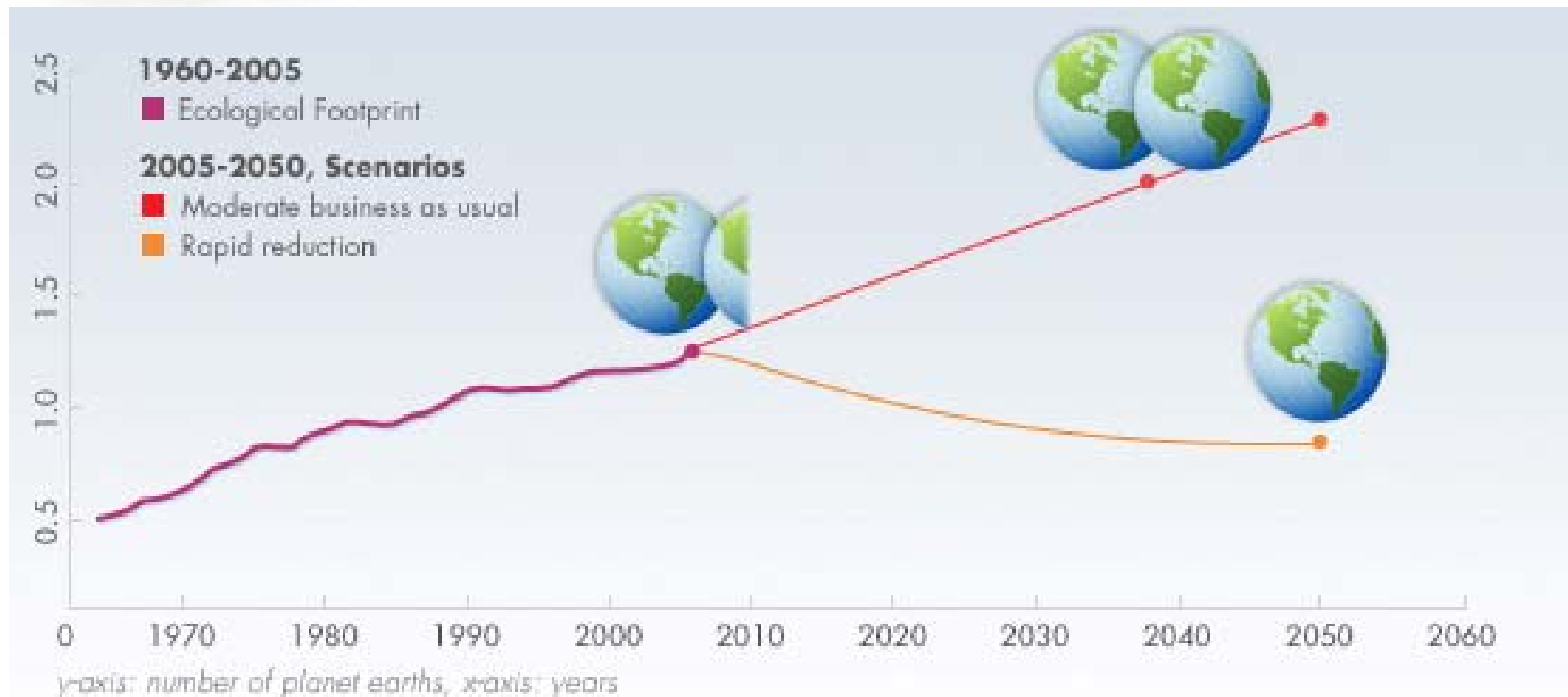
▲ Hadley Centre drought prediction

Global soil moisture forecast ▶





Ecological overshoot



By 2050 we will need 2 Planet Earths to sustain us.

Source: GFN



The challenge

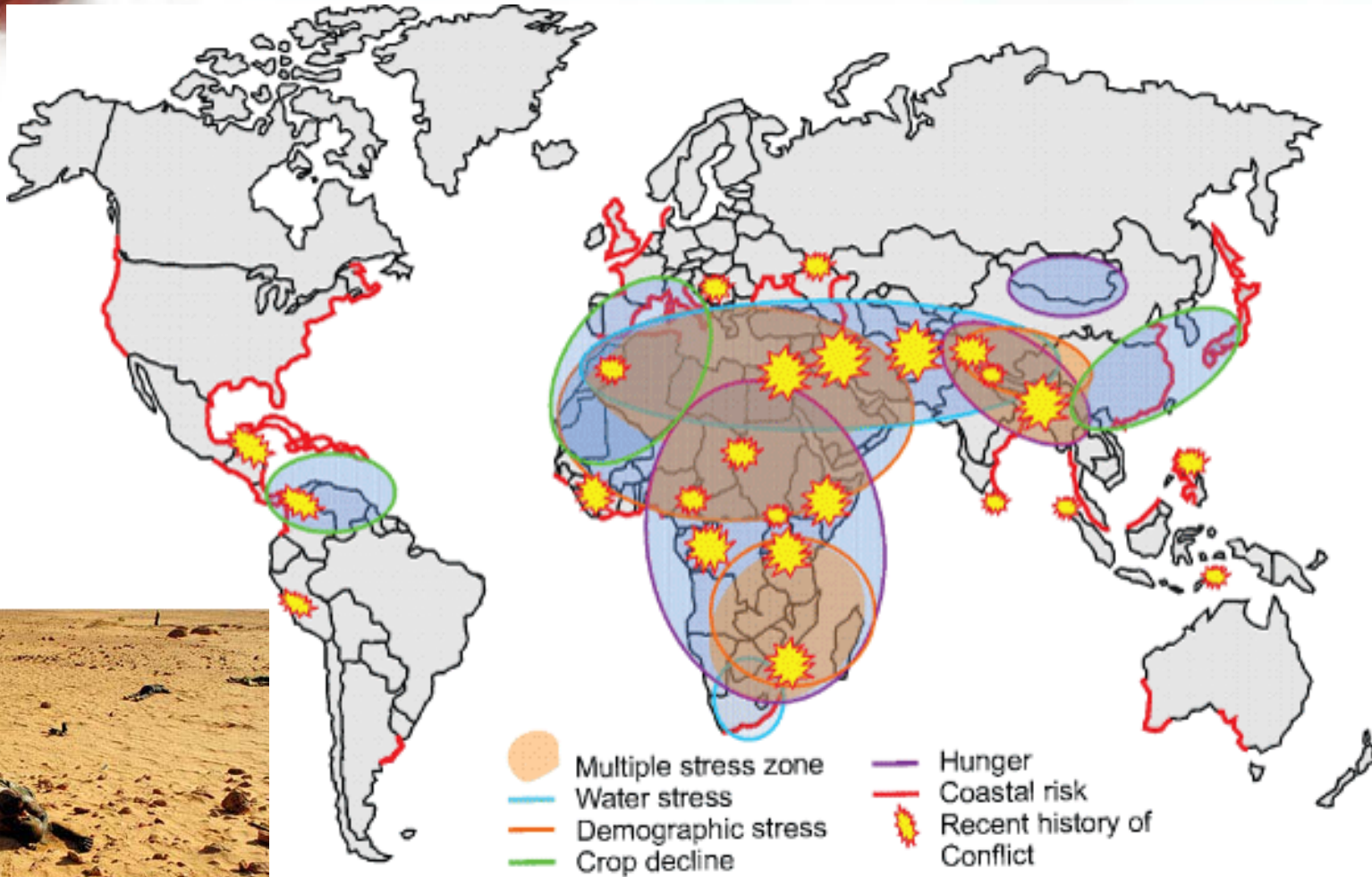
To double global food production with:

- half the present available water
- far less land (?35%)
- dwindling fossil fuels
- scarce and costly fertilisers
- less new technology
- more drought & climatic uncertainty.



Third World War?

UK Ministry of Defence threat assessment, 2008





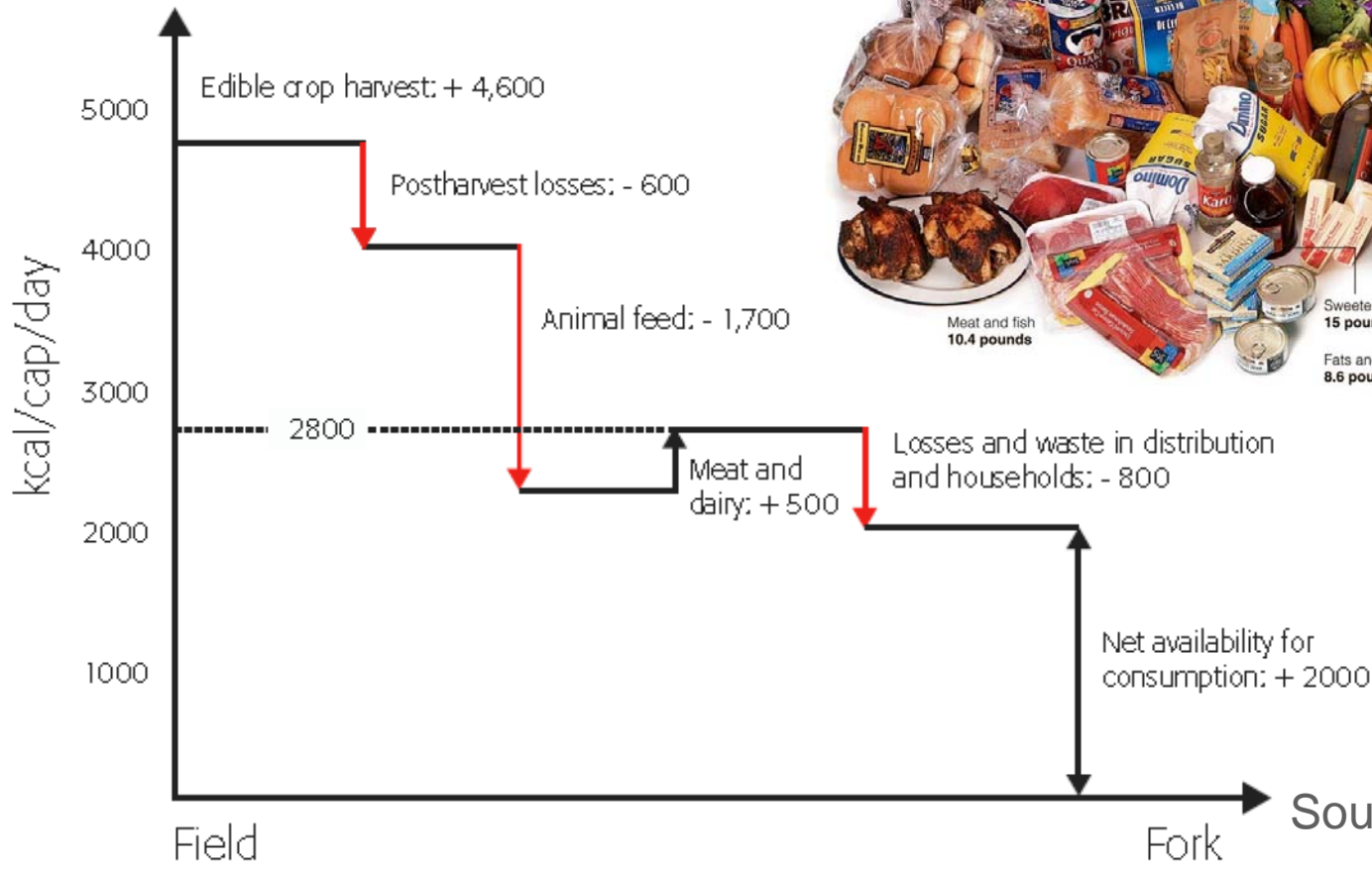
Refugees: rising tide



Category of forced displacement	Total (in mln)
Refugees under UNHCR mandate	11.4
Refugees under UNRWA mandate	4.6
Total number of refugees	16.0
Conflict-generated IDPs	26.0
Natural disaster IDPs	25.0
Total number of IDPs	51.0
Total number of refugees and IDPs	67.0



Solutions 1: stop wasting food



Source: SIWI 2008



Global solutions 2

- Increase ag RD&E by 400% to \$120bn
- Limit human numbers to 2-3 billion by 2100
- Recycle nutrients back into food production
- Recycle urban water
- Develop 'green food' and 'green cities'
- Develop new energy sources (algae farming)
- Develop new highly efficient farming systems that use less land, water, nutrients, pesticides



Solutions 3: change our diet





Australia's role...

- Be the world's 'drought experts' (WUE)
- Lead in low-input farming systems
- Value farmers and pay for what they do for us
- Establish a farm knowledge export sector
- Educate consumers to eat sustainably
- Recognise ag research is "defence spending"



A bright outlook if...

- We use less energy, water, land – and more brains and people
- We are first with the best new farming systems and technologies
- We “green” our cities and end waste
- We help our neighbours overcome their food insecurity
- We change our behaviour with regard to food and the Earth’s resources.



Thank you.

“The Coming Famine” will be published by the University of California Press **in April 2010.**

Debate global food security on:

<http://www.sciencealert.com.au/global-food-crisis>