Meeting the C21st Food Challenge

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Facing the Global Food Crisis

NSW Parliament

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A ‘wicked’ problem…

DEMAND:

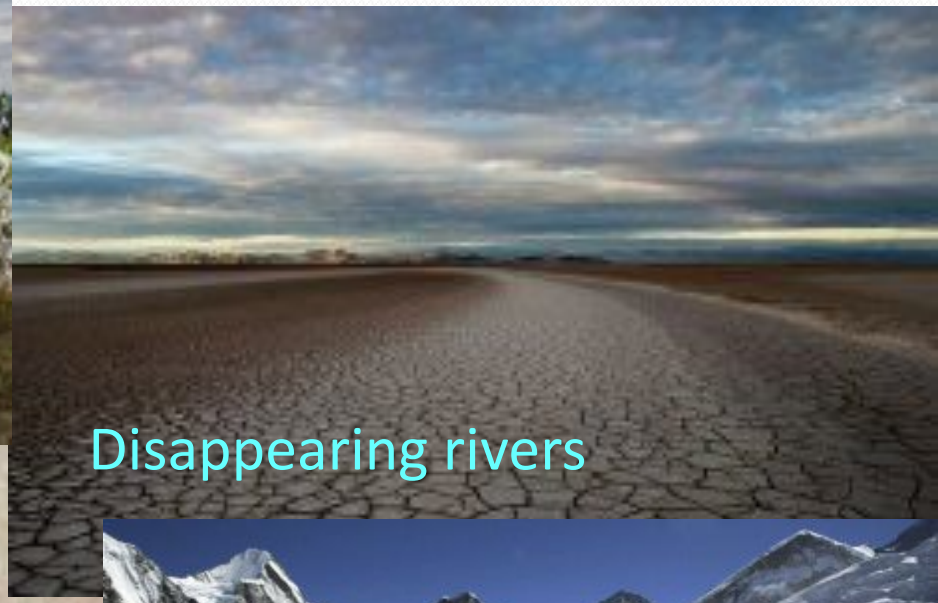
- 216,000 more people every day
- More babies + longer lives
- Population >11 bn by 2100
- Meat demand soaring in NICs
- Food demand +100% by 2060s
- 40-50% climate penalty by 2100

LIMITATIONS:

- ‘Peak water’
- ‘Peak land’
- ‘Peak oil’
- ‘Peak P’
- ‘Peak fish’
- ‘R&D drought’
- ‘Capital drought’
- ‘Climate extinction’

Peak water

"Current estimates indicate we will not have enough water to feed ourselves in 25 years time..."
– Colin Chartres, IWMI



The struggle for water

- Energy sector - tripling by 2050
- Cities - doubling by 2050
- Minerals processing - doubling by 2050
- Manufacturing
- Environment
- …..how much is left for farmers and food?

Unsustainable: 10 kilos of soil lost for *every meal eaten*

"The Earth is losing topsoil at a rate of 75 to 100 GT. per year. If soil loss continues at present rates, it is estimated that there is only another 48 years of topsoil left."

- Marler & Wallin, Nutrition Security Institute, USA, 2006

Megacities: mega-risks

By 2030...	Population (in millions)
Jakarta	37
Tokyo-Yokohama	36
Manila	36
Mumbai	30
Delhi	30
New York	20

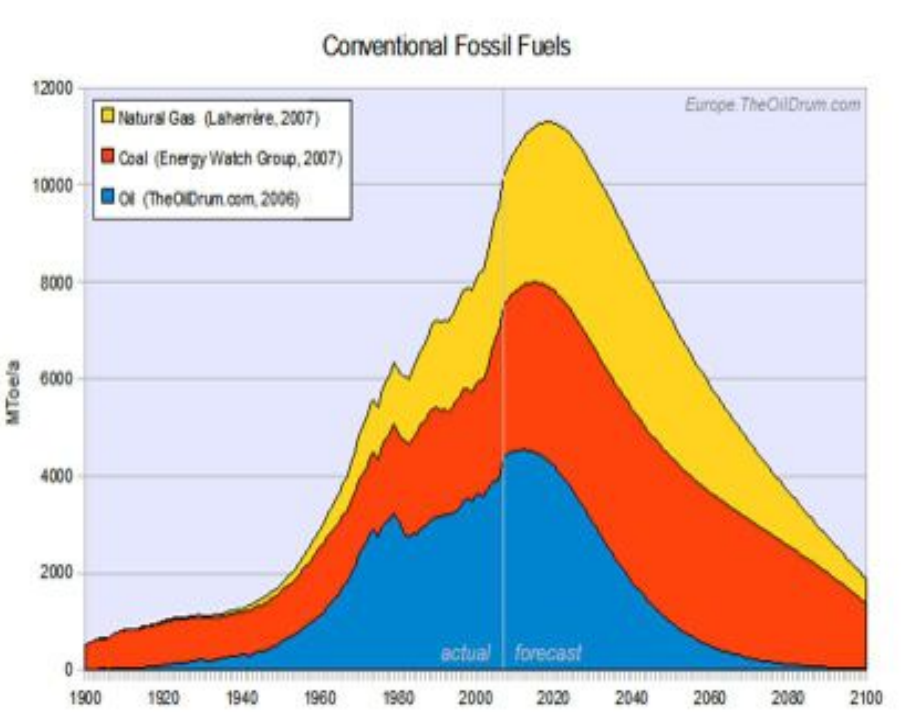
By 2050...

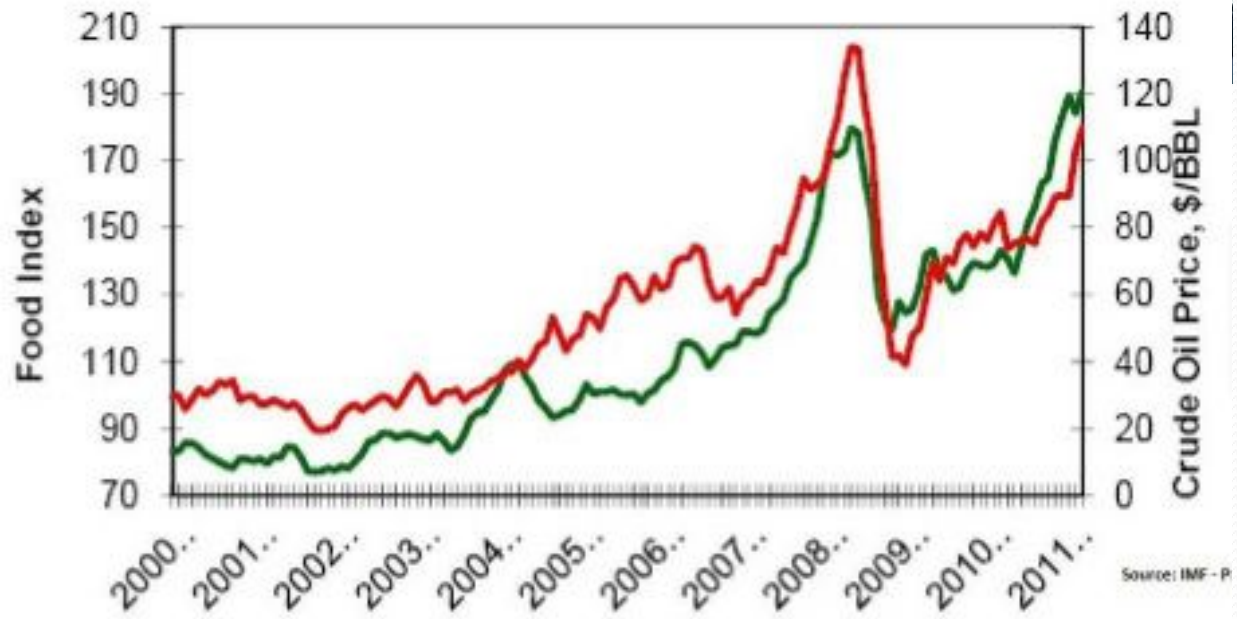
7.7 billion will live in cities

Total urban area = China

Urban water use 2800 cu kms

Cities cannot feed themselves

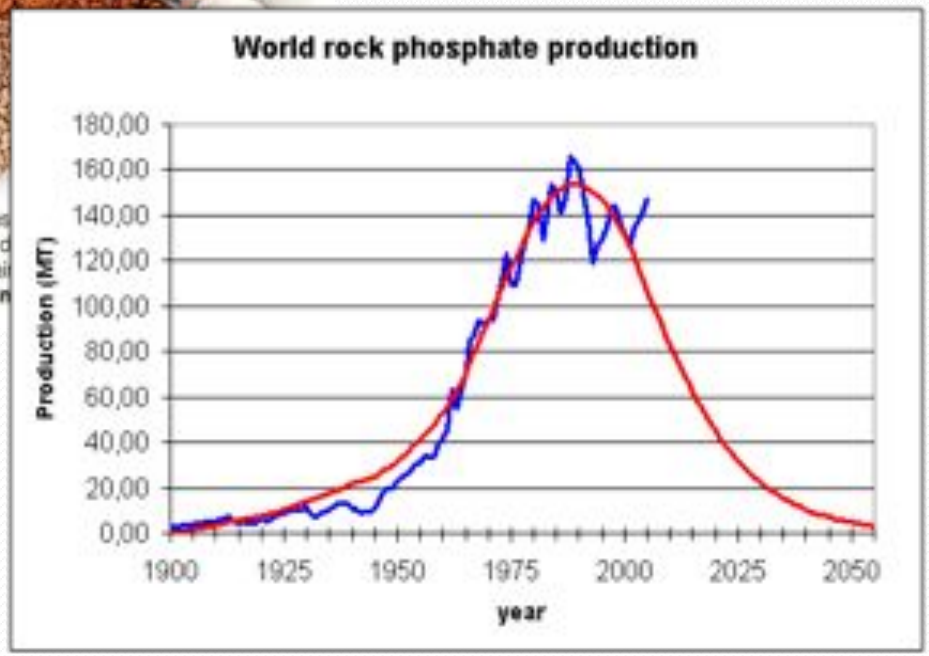




Car numbers growing 7x faster than oil supplies

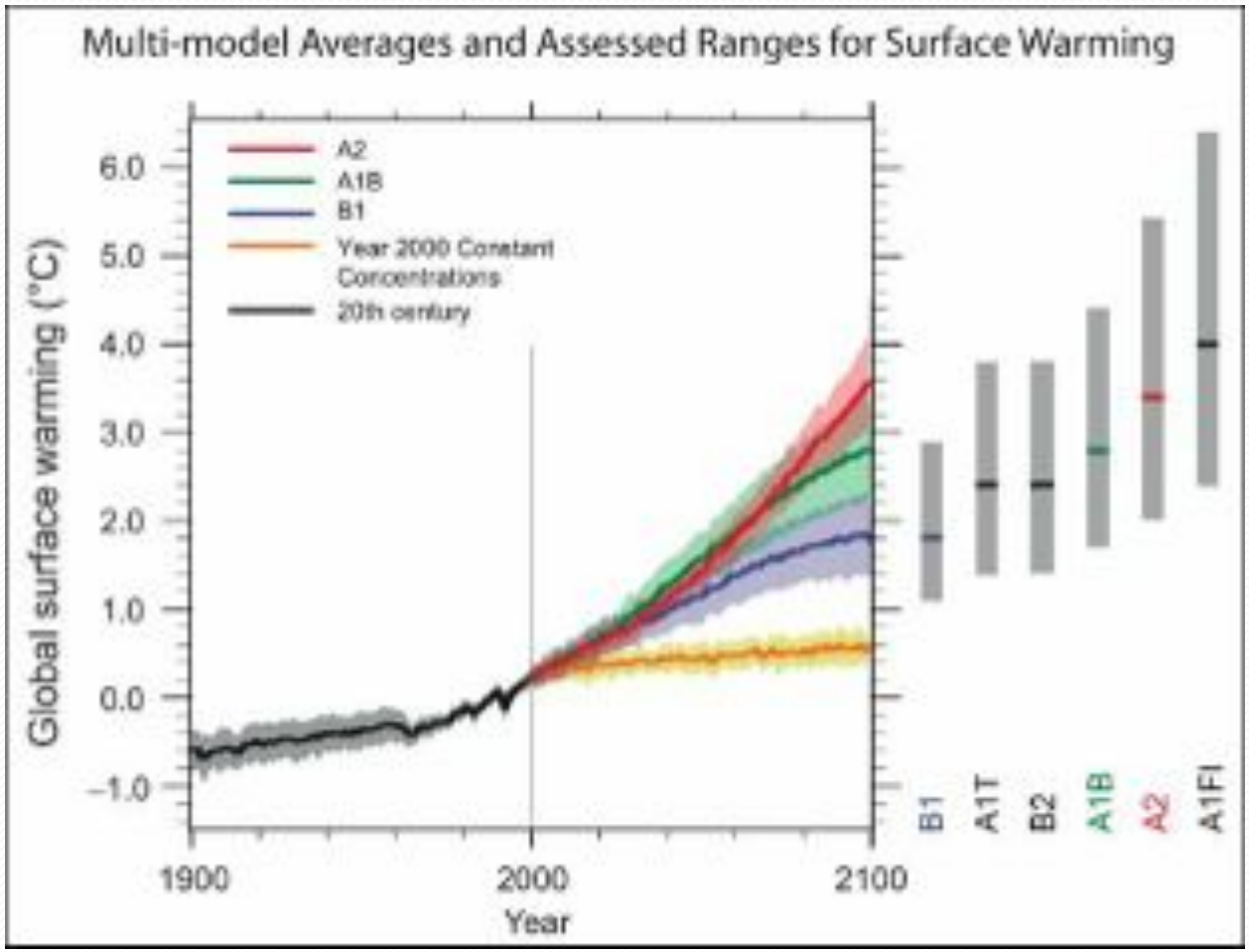
Why we must recycle nutrients

< 30-50% of world's food is currently wasted or lost post-harvest



Sources of artificial fertilisers will be scarce by 2050 >

Hotting up: +4º by 2100



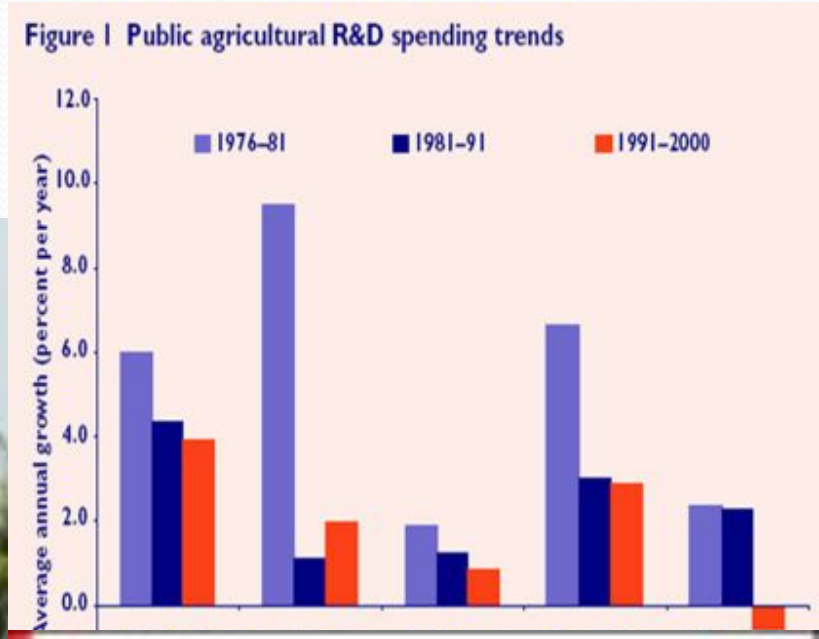
4-5 degrees global warming by 2100: IPCC

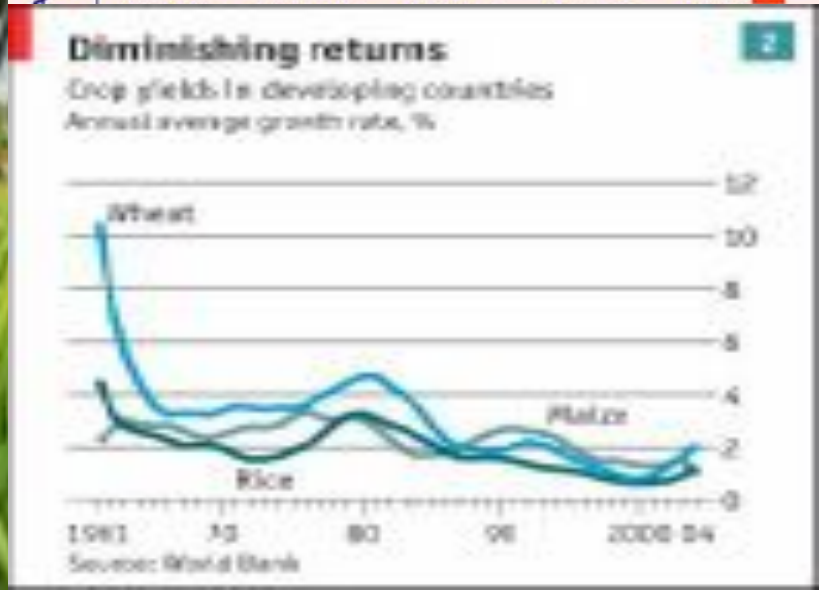
10% of food lost for each 1º of warming

= We will need 140% more food by peak population

Source: IPCC

Re-arm ag science

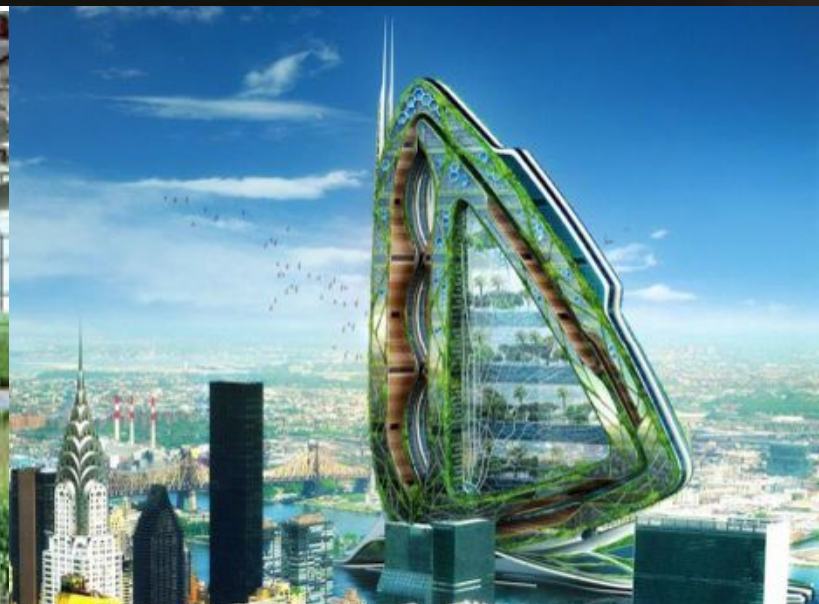




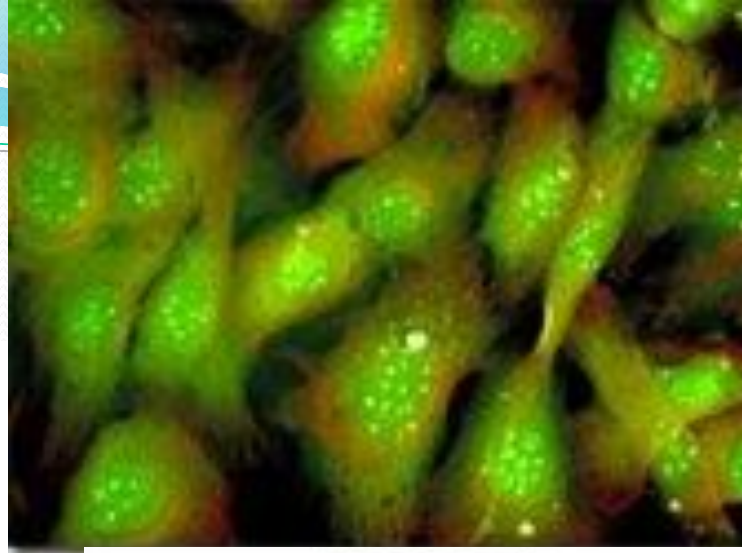
What are the solutions?

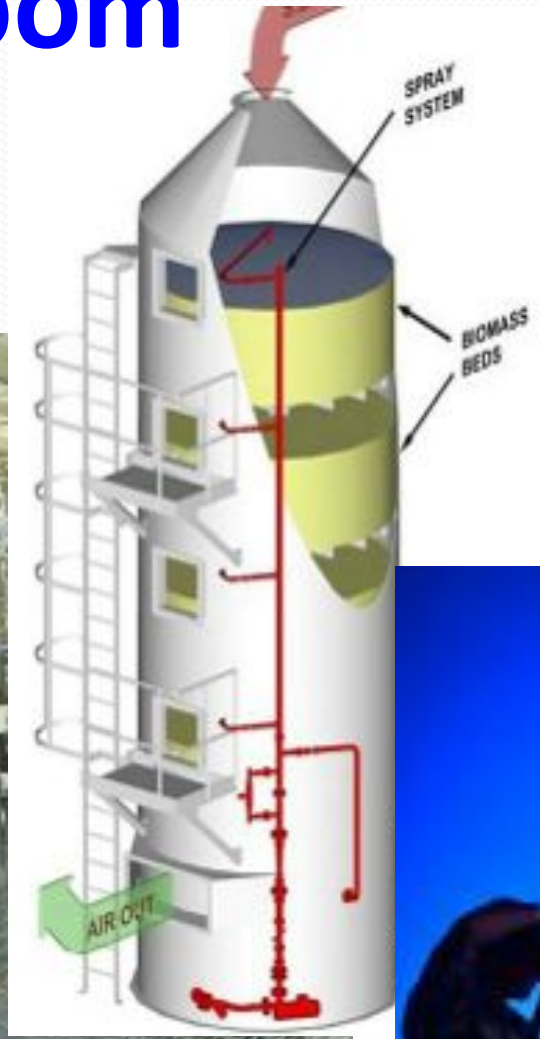
- Reinvent farming & food systems: sustainable, low-input eco-farming
- Reinvest massively in food research
- Reinvent the global diet: so it is healthier, damages less planet
- Redesign cities: to recycle water, nutrients, energy back into food.

Urban farming: climate-proof



Bioculture boom





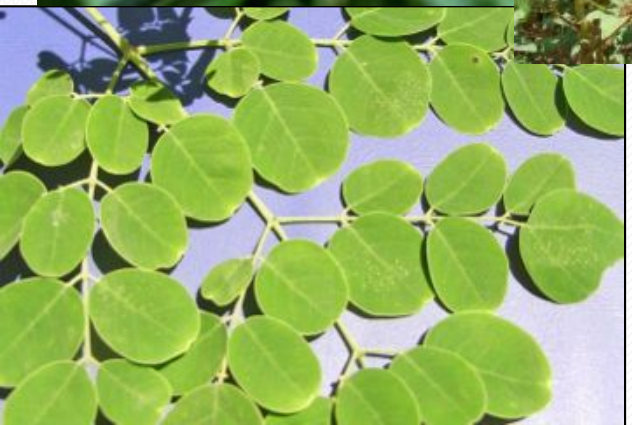
25,000 edible plants





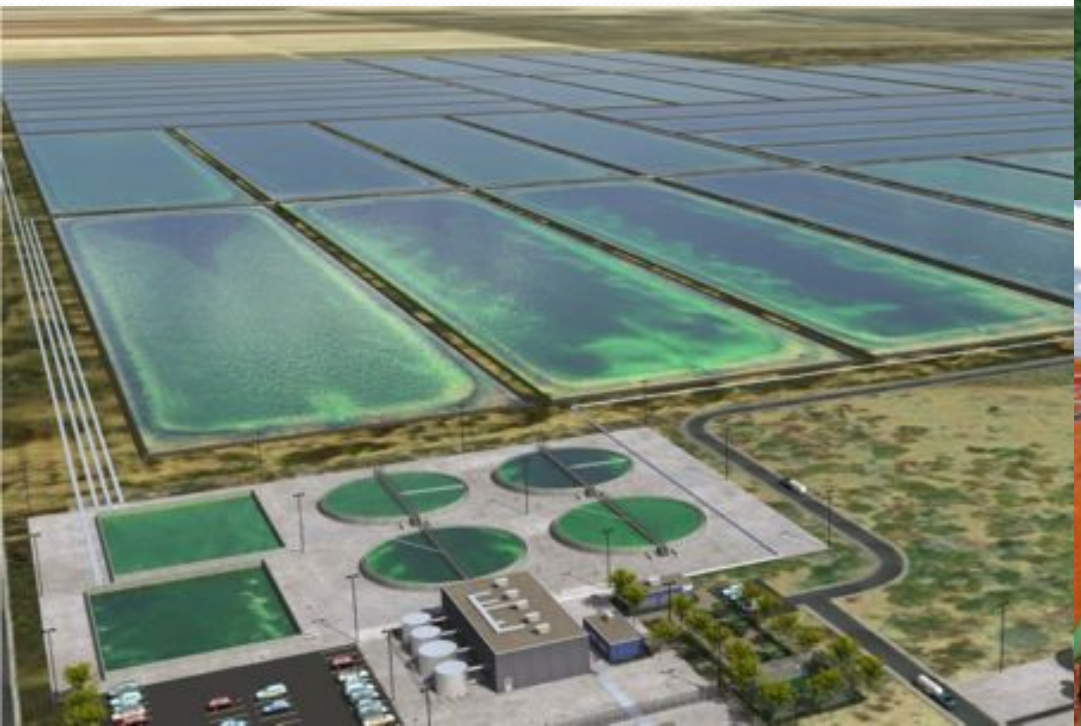






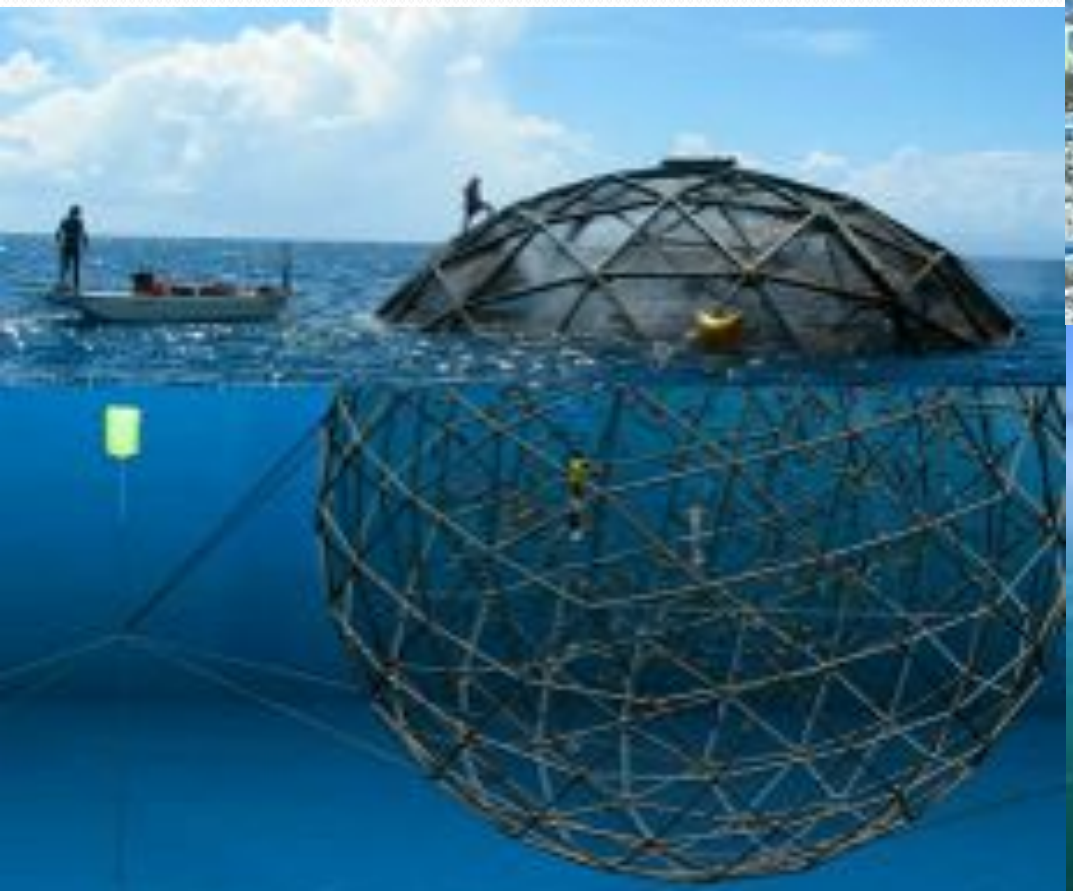

Algae boom

By 2050 algae could be a $55 billion industry for Australia supplying **transport fuels, health food, stockfeed, plastics, textiles, chemicals, paper** etc



Fish farm boom

World demand for 550mt of meat and fish by 2100 will require **2-3 bn tonnes extra of plant-based feed.**



Revegetate, recarbonise, rehydrate

Future farming

- Double global investment in ag and food R&D to $200bn by reducing military spending 10%
- This will reduce conflict AND boost food security
- Ecofarming: combine best of high-tech farming with permaculture and automation
- Radically reduce all resource inputs.
- Major focus on soil biology, crop science, nutrient cycling, soil, water, energy & carbon conservation
- Systems that operate at large and small farm scales, across landscapes

Great challenges …
wonderful opportunities

- Develop eco-farming by global sharing of knowledge between farmers
- Reshape world diet for health and sustainability
- Design cities that do not waste
- Reward farmers for producing good food and caring for water, land, wildlife and atmosphere.