Sustainability Starts with a Stable Population

Jane O'Sullivan
Sustainable Population Australia

Engineering a Steady State Economy
SENG Forum
24 November 2015

Overview

1. Overpopulation is the only real threat to sustainability

- Almost all other sustainability measures are work-arounds for population pressure.
- All will be undone by sufficient further growth.

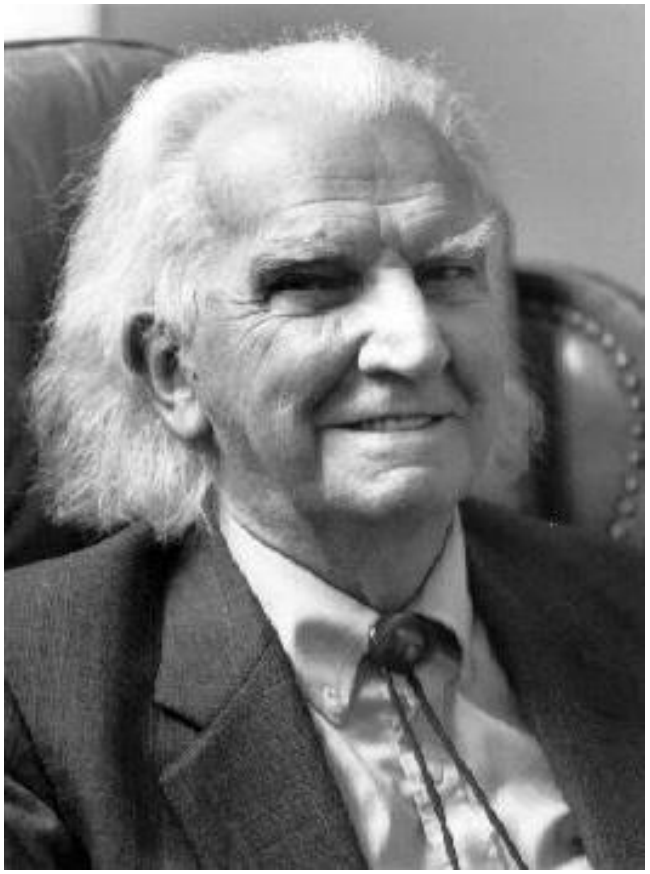
2. Population stabilisation is a choice we could make

- And one we are not choosing
- No, it doesn't depend on reducing poverty first.

3. It's not just a scale factor: A growing population has different economic and social dynamics than a stable one.

- **Resources** must be recruited – 'circular economy' is not possible.
- **Productivity** gains must fight against falling resource quality and accessibility
- Costs shift from exchange of labour to **economic rents – driving inequality**
- **'Capital widening'** diverts funds from quality of services – not an investment
- **Planning** can only ease transitions – all outcomes are ephemeral

Kenneth Boulding



"Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist."

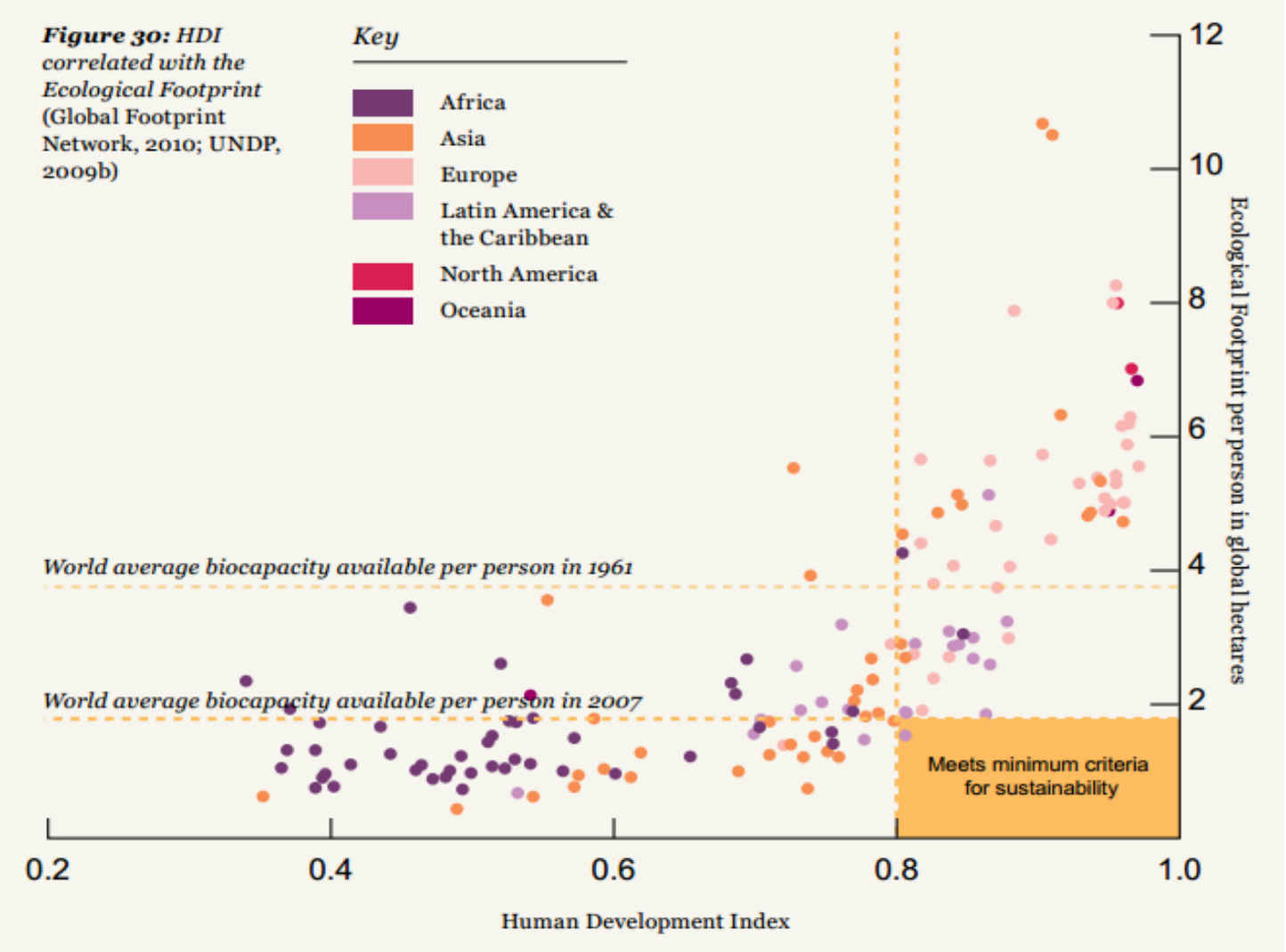
Kenneth Boulding's Dismal Theorums

1. **The dismal theorem:**
   If the only ultimate check on the growth of populations is misery, then population will grow until it is miserable enough to stop its growth.

2. **The utterly dismal theorem:**
   Any technical improvement can only relieve misery for a while, for so long as misery is the only check on population, the [technical] improvement will enable the population to grow, and will soon enable more people to live in misery than before. The final result of [technical] improvements, therefore, is to increase the equilibrium population, which is to increase the total sum of human misery.

3. **The moderately cheerful form of the dismal theorem:**
   If something else, other than misery and starvation, can be found which will keep a prosperous population in check, the population does not have to grow until it is miserable and starves, and it can be stably prosperous.

Can we live sustainably with dignity?



Source: WWF Living Planet Report 2014

Population growth has reduced biocapacity per person to below our consumption.

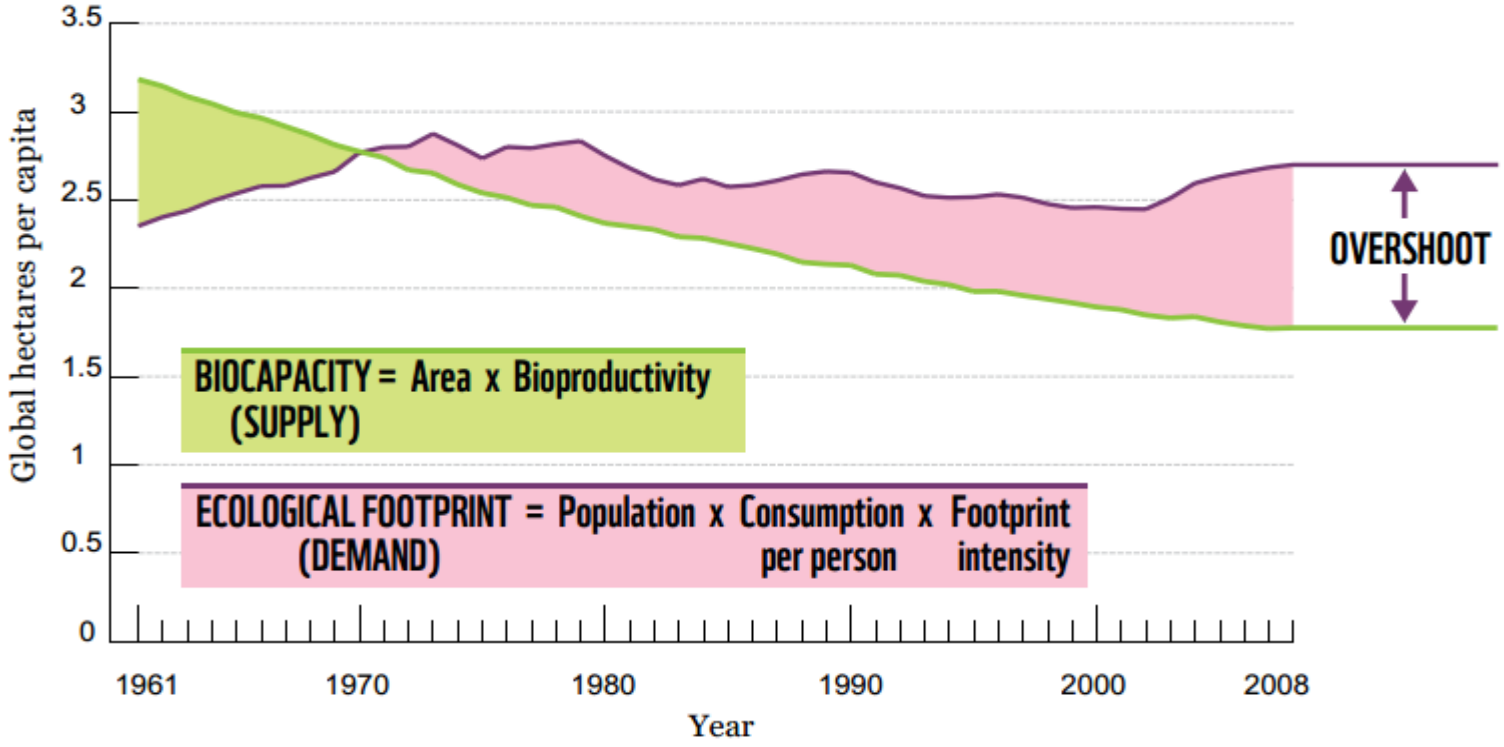


Figure 23: Trends in Ecological Footprint and biocapacity per person between 1961 and 2008

The decline in biocapacity per capita is primarily due to an increase in global population. More people have to share the Earth's resources. The increase in the Earth's productivity is not enough to compensate for the demands of this growing population (Global Footprint Network, 2011).

Source: WWF Living Planet Report 2012

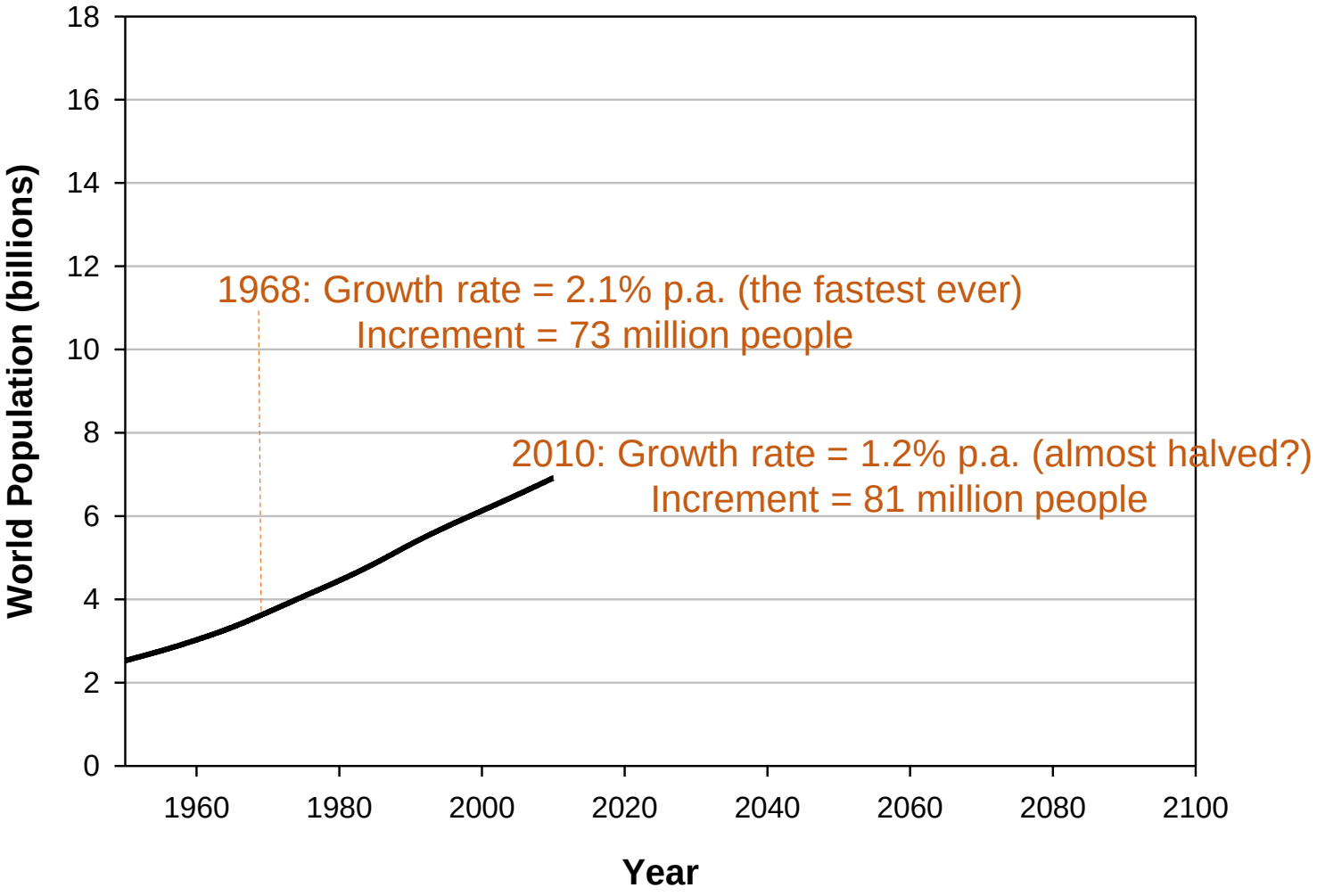
2. Population stabilisation is a choice we could make

How much future population growth is CHOICE?

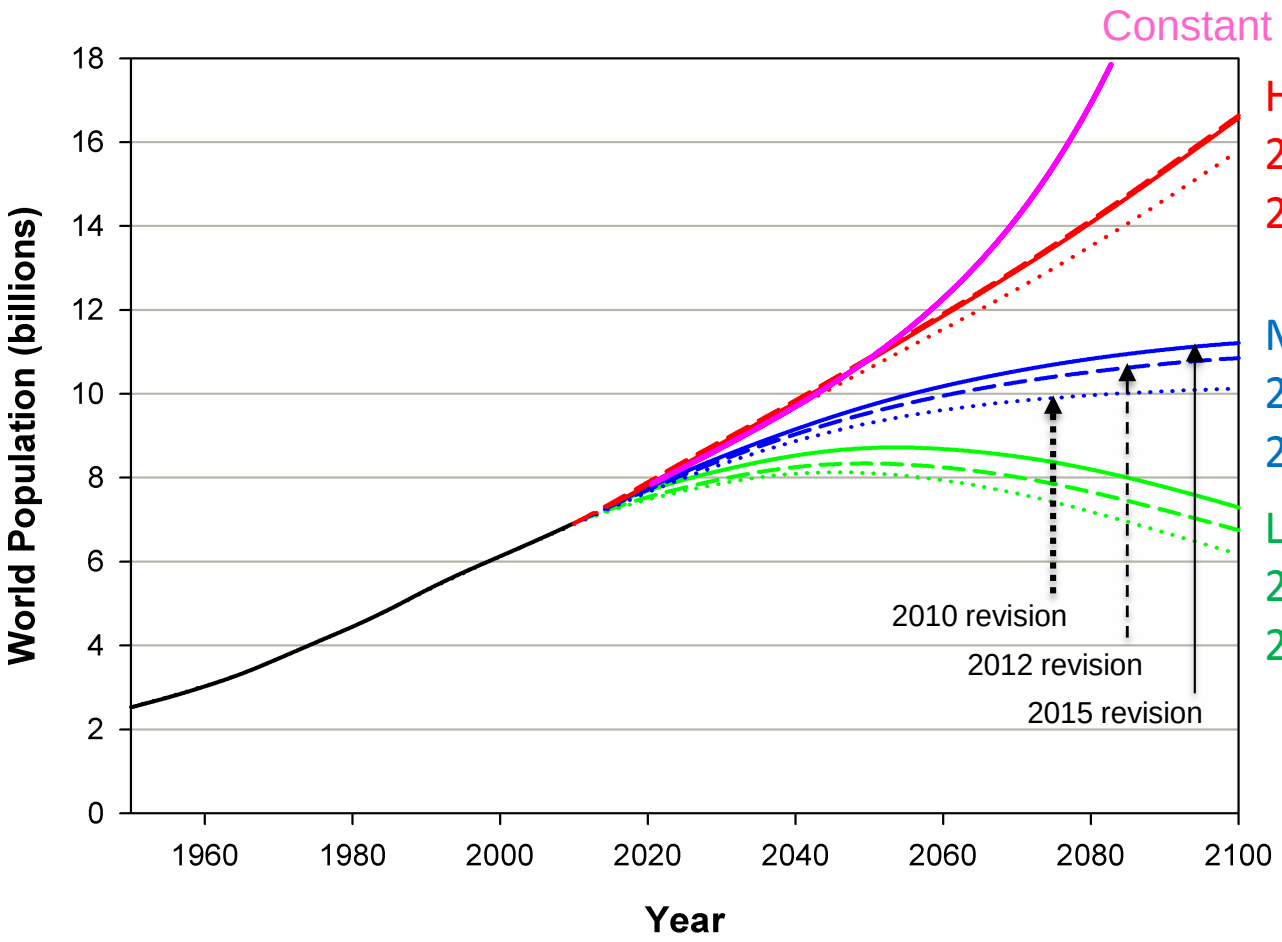
Global Population - key facts:

- We are adding around 80 million people to the planet annually – 1 Billion every 12 years.
- Growth is not slowing – roughly linear for 4 decades.
- We are not past 'peak child' – births are increasing.
- Fertility rates are not dropping as fast as the UN's medium projection assumes.
- No country is at risk of population collapse through 'birth dearth'.

Isn't population growth already stopping by itself?

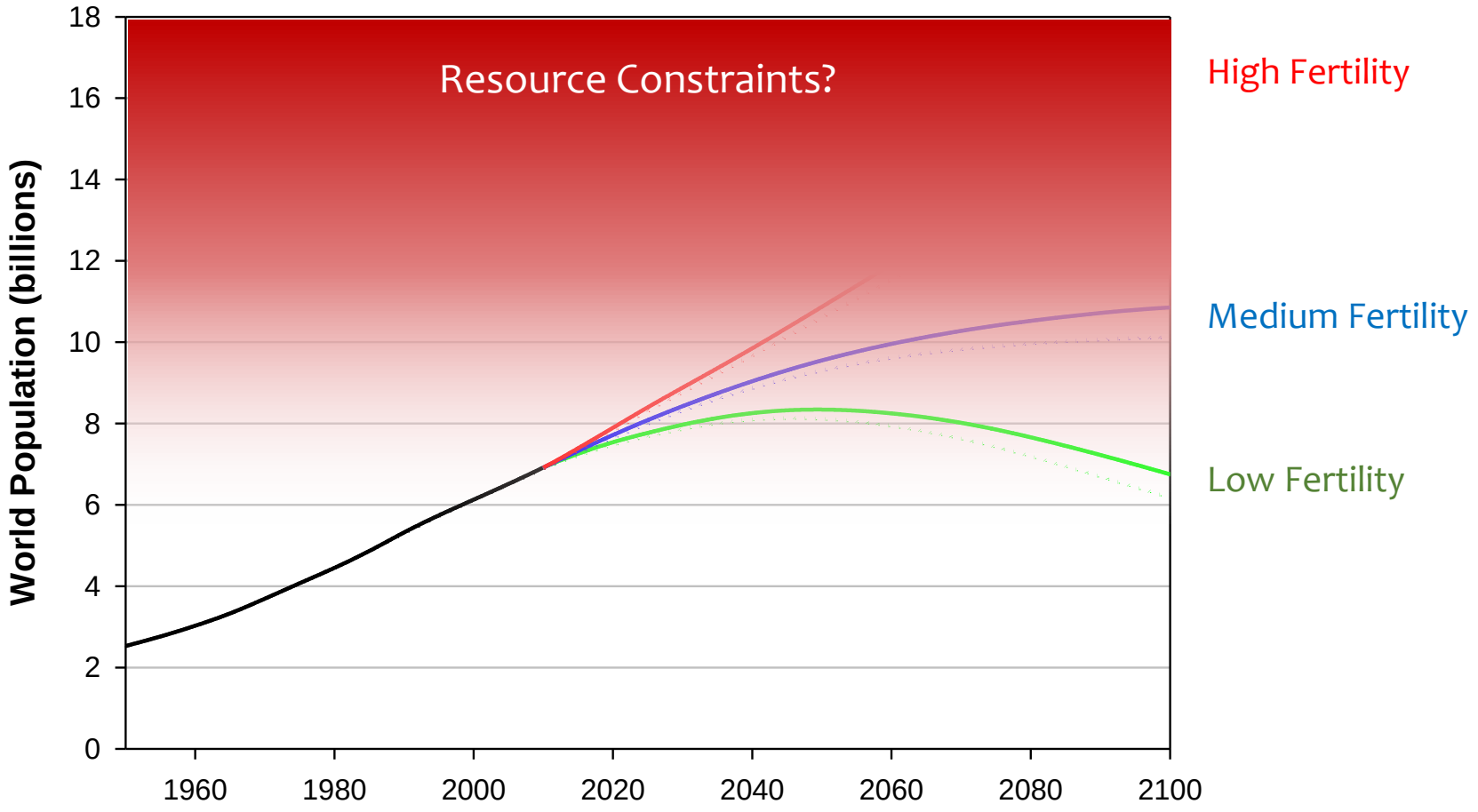


UN Population Projections keep being revised upward



2100 population estimate has increased **more than 1 Billion** in five years!

Projections are blind to carrying capacity



Joel Cohen "**How Many People can the Earth Support**": 7-12 billion is "the zone"

"If most people would prefer a decline in birth rates to a rise in death rates, then they should take actions to support a decline in fertility while time remains to realize that choice."

Press briefing upon publication of UN's "World Population Prospects: The 2012 Revision"

"… Most of this increase is due to changes in our estimates of ***current*** fertility for several high-fertility countries …

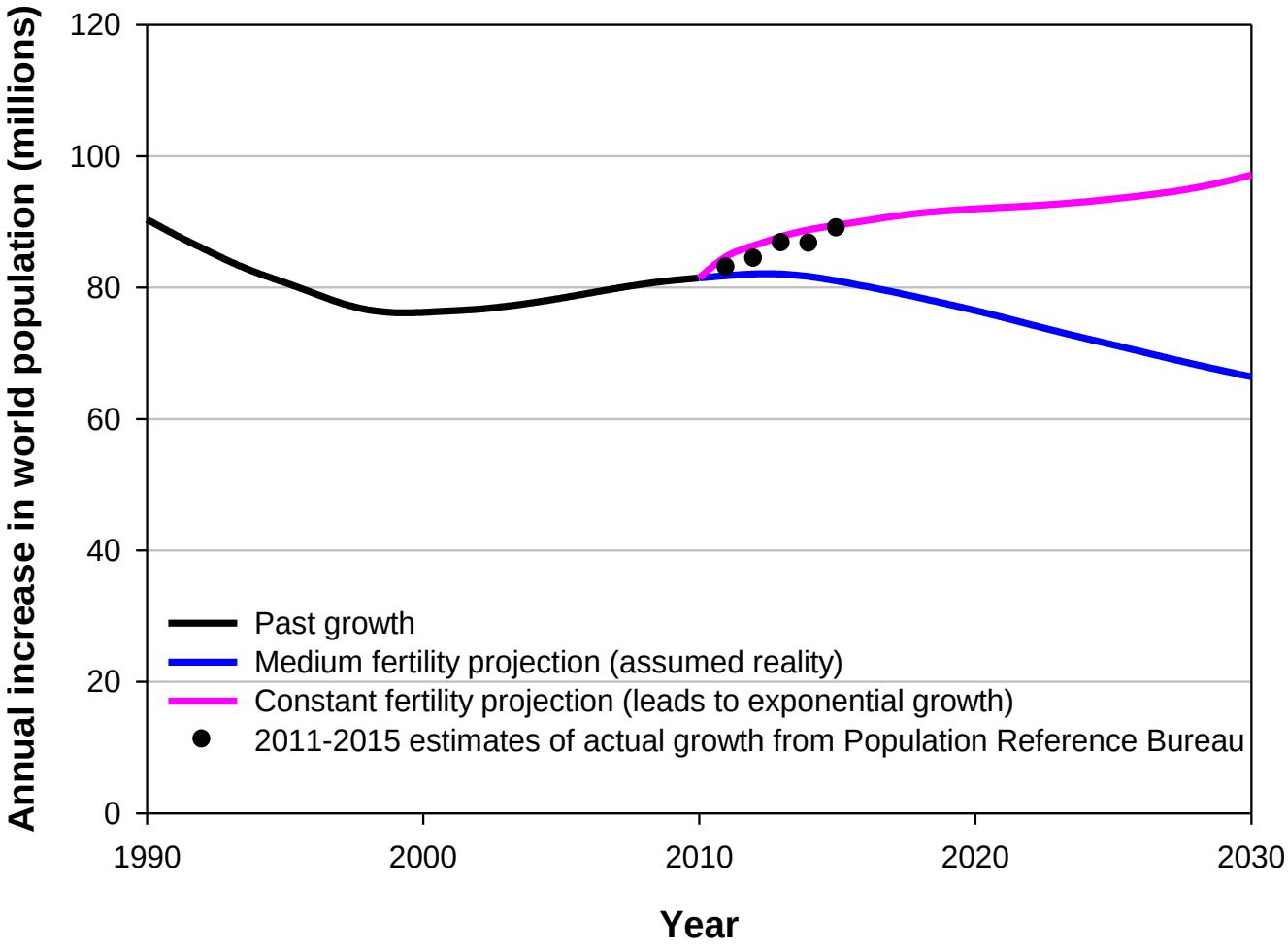
"Our medium-variant projection continues to assume a rapid fall in future levels of fertility for these countries…

The medium-variant projection is thus an expression of what ***should be possible …***

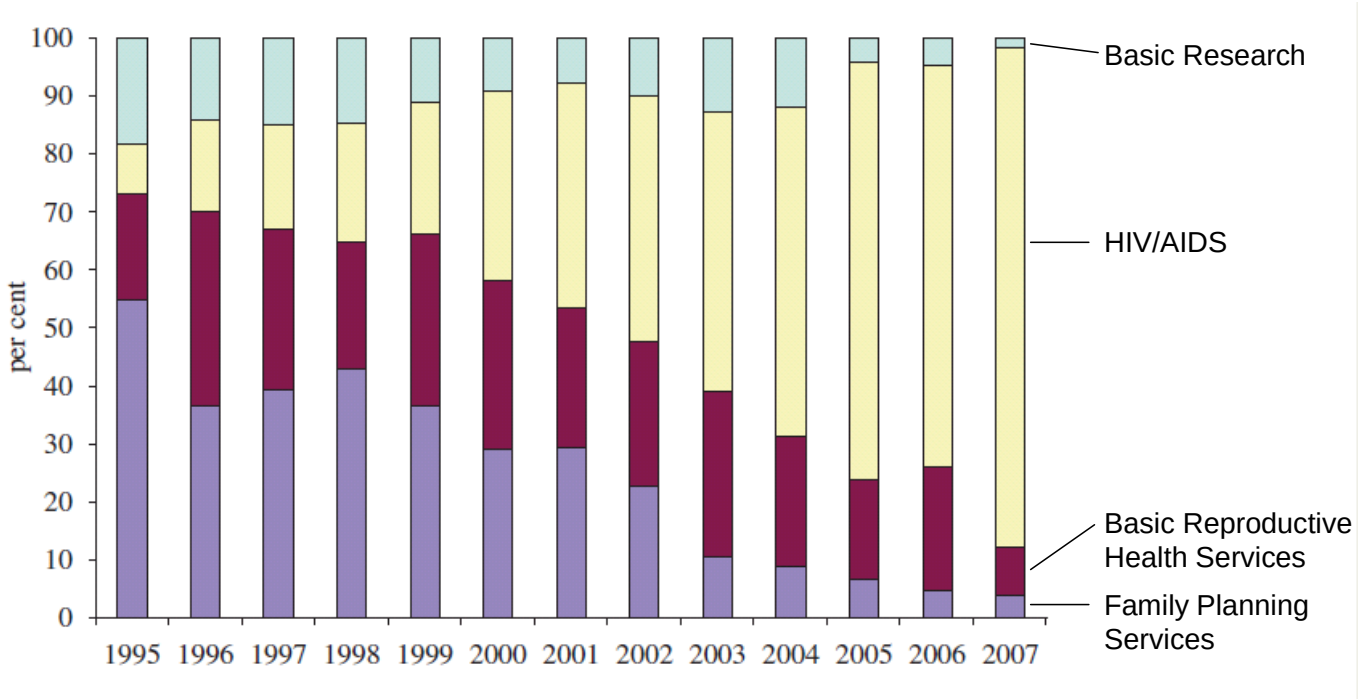
"… [it] could require additional substantial efforts to ***make it possible.***"

John Wilmoth, Head of Population Division, UNDESA
(emphasis in the original)

Annual Increment of Population



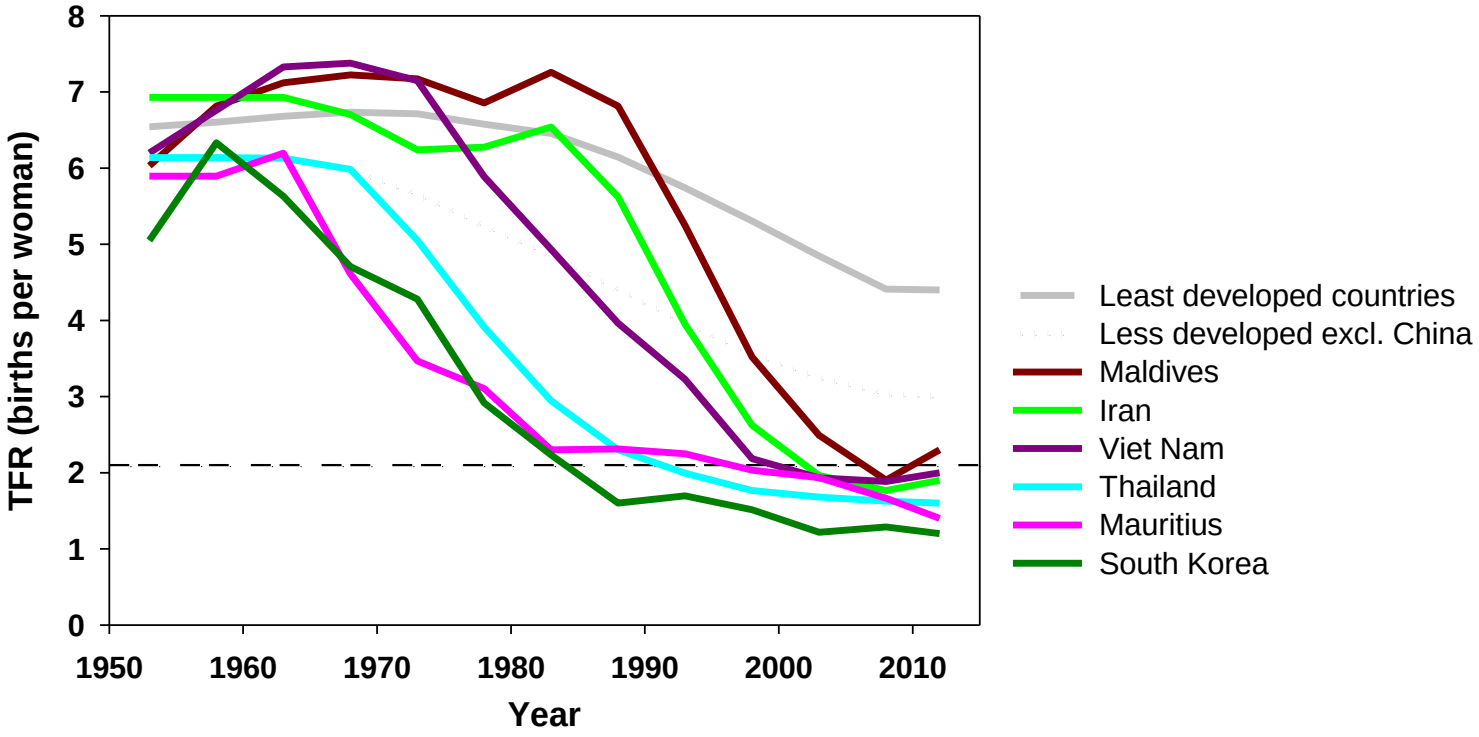
International support for family planning has fallen



Allocation of international funding for "Population Assistance"

from S.W. Sinding 2009. Population Poverty and Economic Development. Phil. Trans. R. Soc. B 2009 364, 3023-3030.

Rapid fertility reduction in response to population-focused voluntary family planning programs

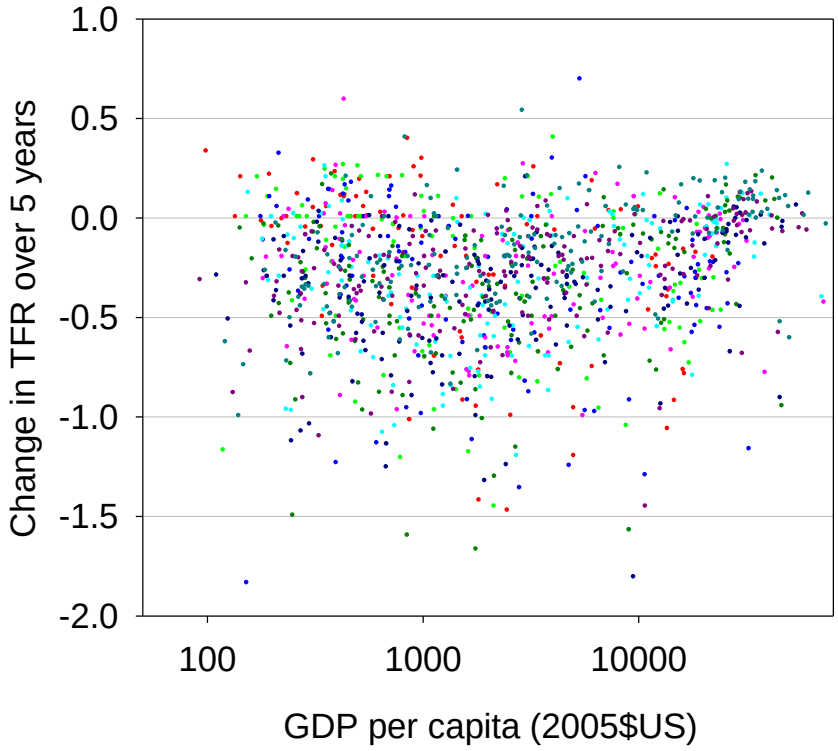


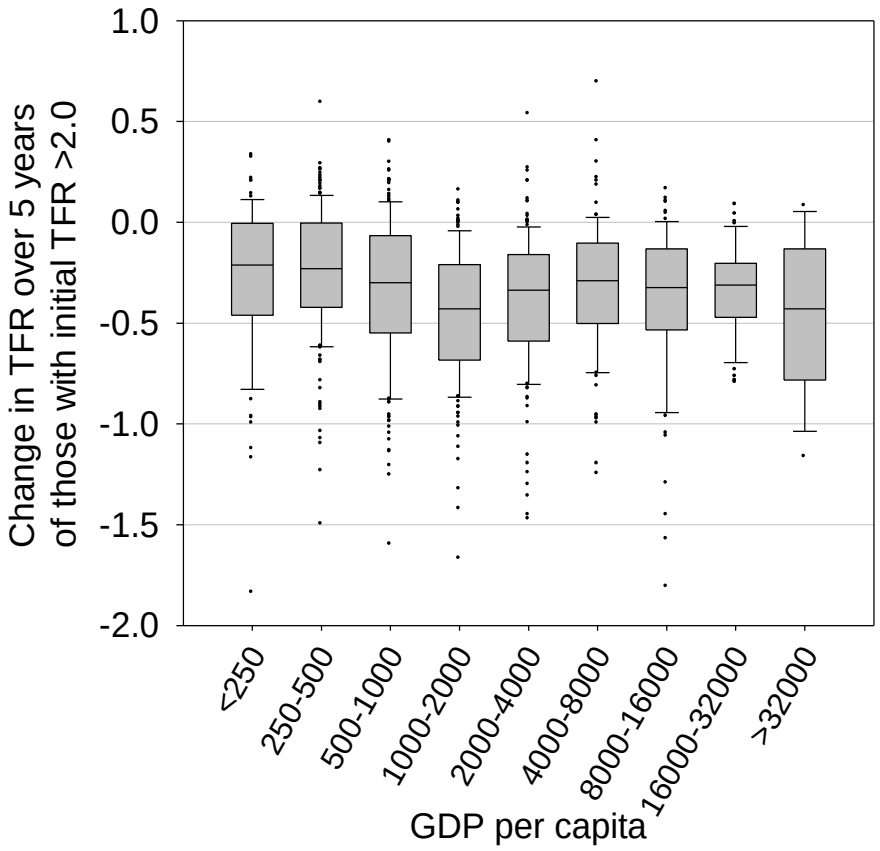
Typical fertility reduction of near 2 units per decade in the first two decades.

(UN projection assumes 1 unit per decade.)

Does fertility decline depend on economic development?

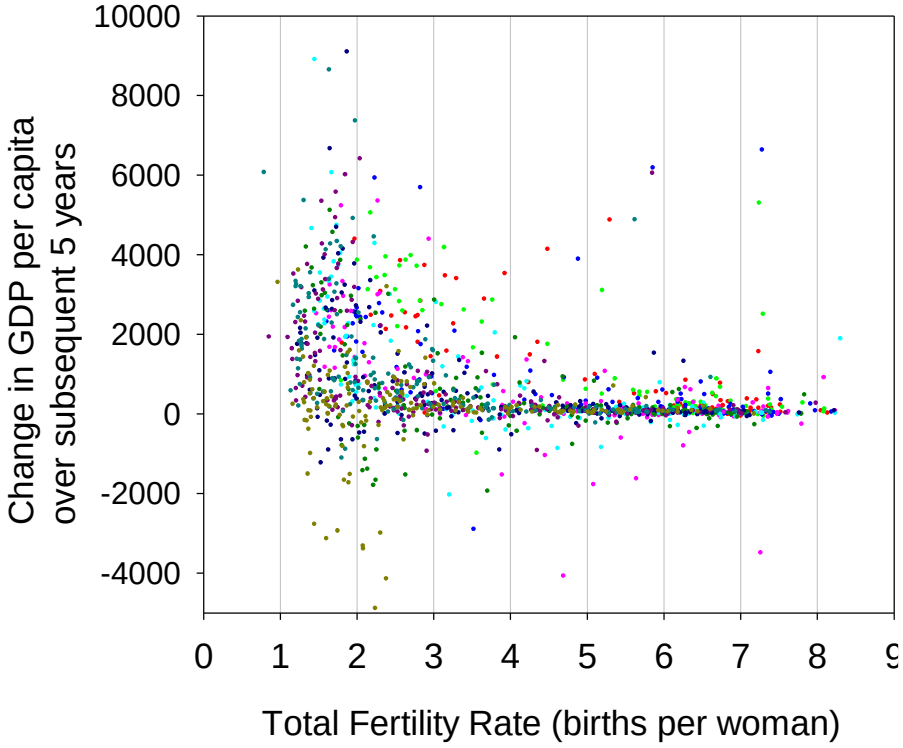
…Nope.

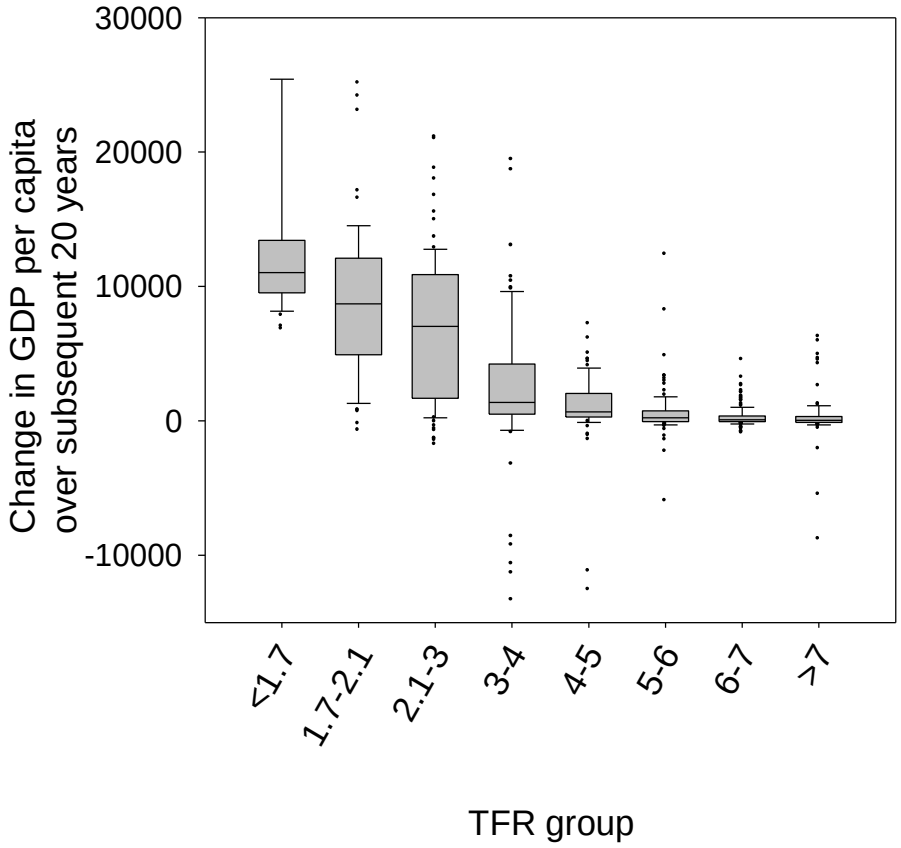




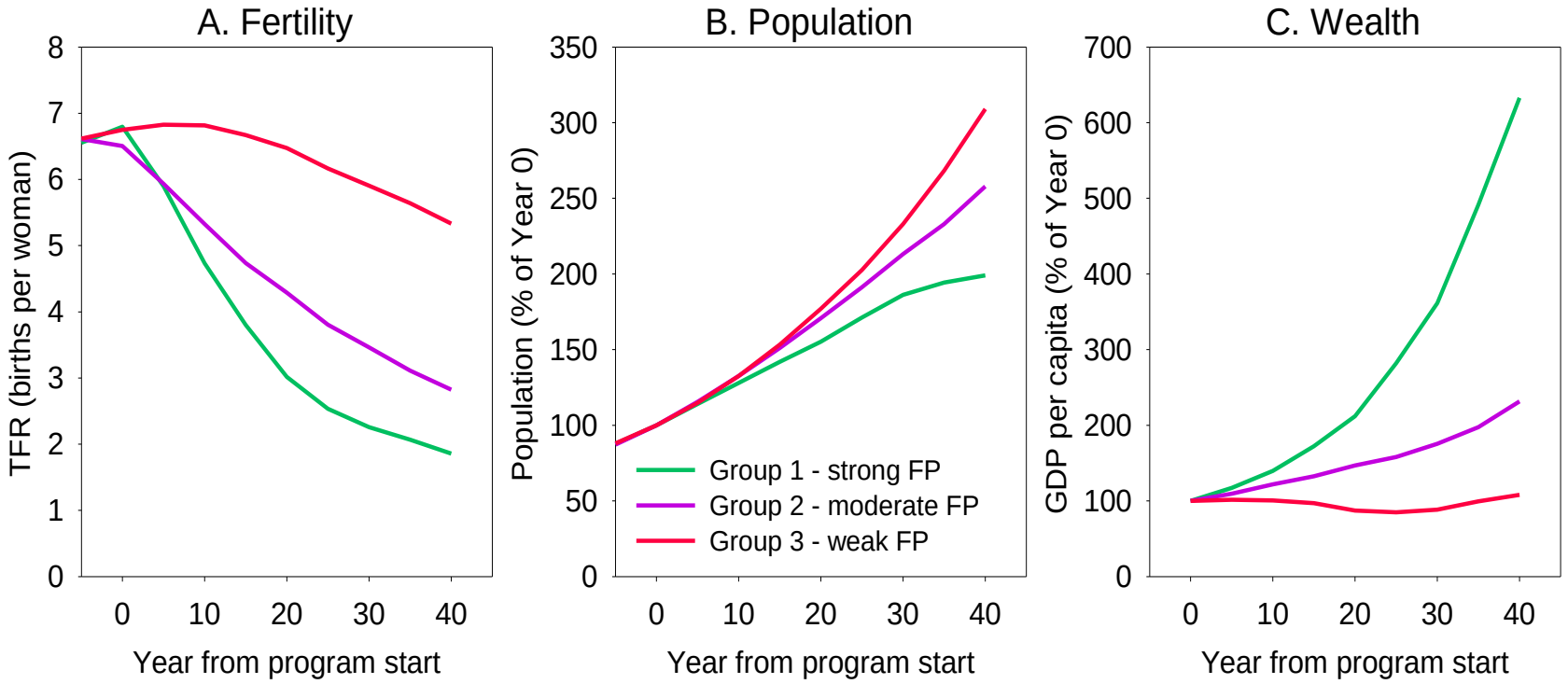
Does economic development depend on fertility decline?

…Hell yeah.



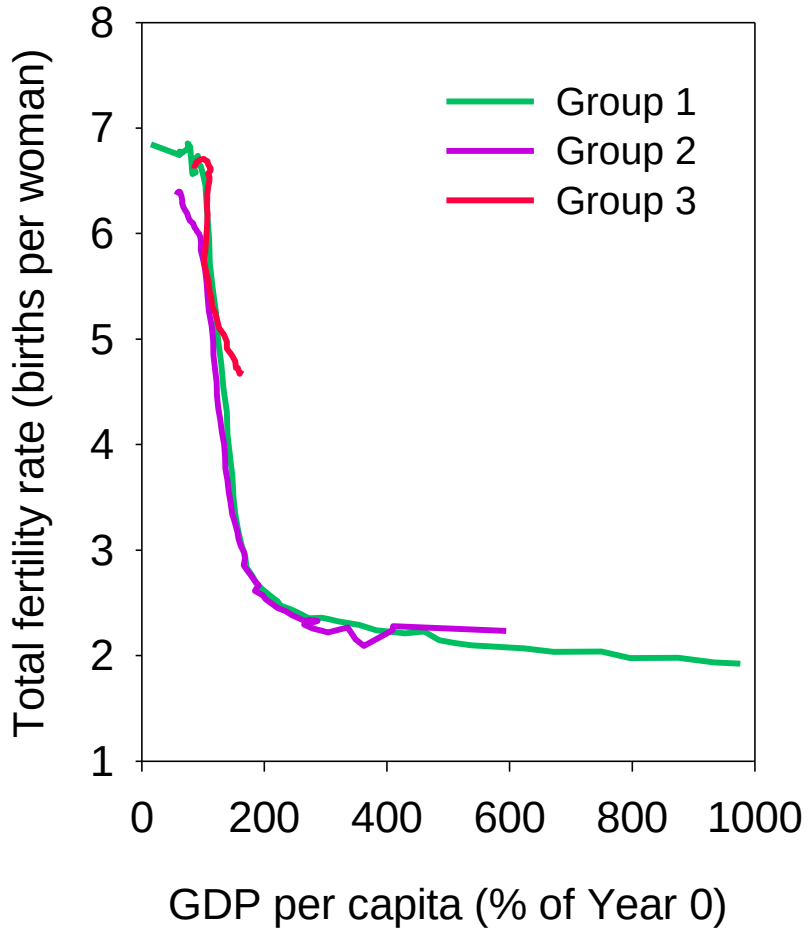


All developing countries grouped by rate of fertility decline:



The time course of fertility, population and per capita wealth for three groups of developing countries: Group 1 – strong, government-driven non-coercive family planning, Group 2 – moderate or not sustained family planning, Group 3 – weak family planning implementation. Year 0 is the approximate year of program adoption, or 1970 for weak adopters. High migration countries excluded.

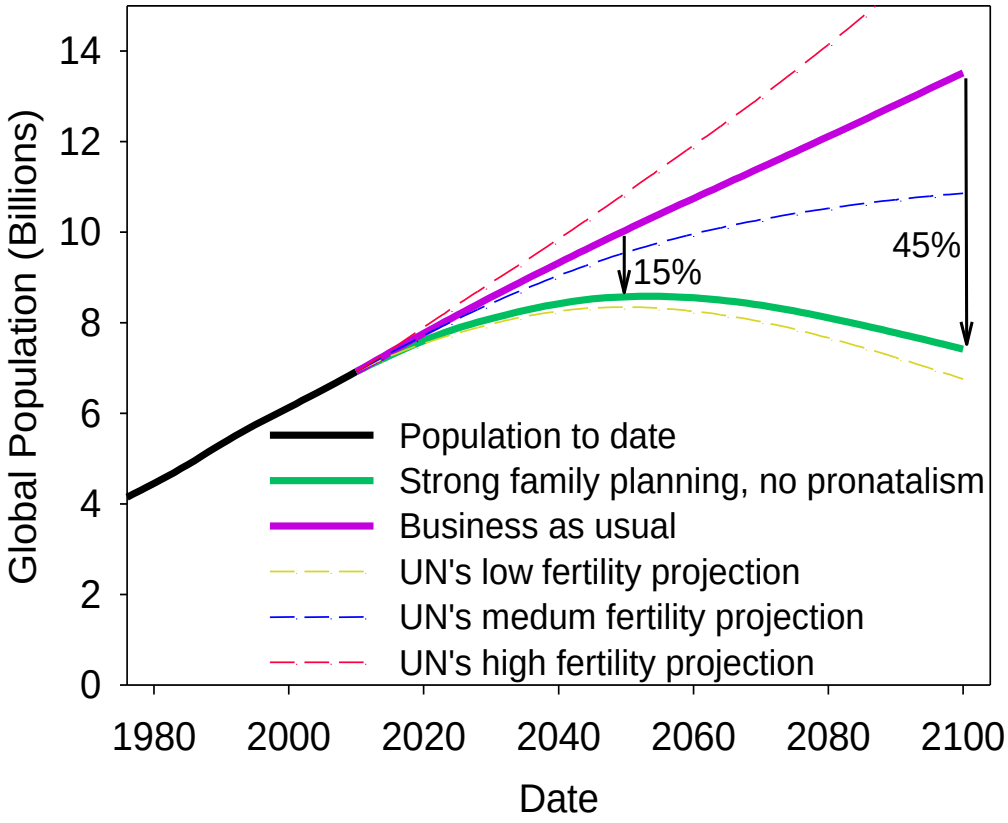
There is no other course to development:



The relationship between family size and economic development, across all developing countries, grouped according to the rate of their fertility decline.

>> If you want world peace and an end to poverty, you MUST support contraception, family planning and small family norms.

Projections based on policy choices



Green: a scenario where poor, high-fertility countries adopt strong family planning and achieve the average fertility path of past adopters, while rich, low fertility countries stop promoting more births.

Purple: continuing the current trend of ignoring population growth as a development priority and boosting births in low-fertility countries.

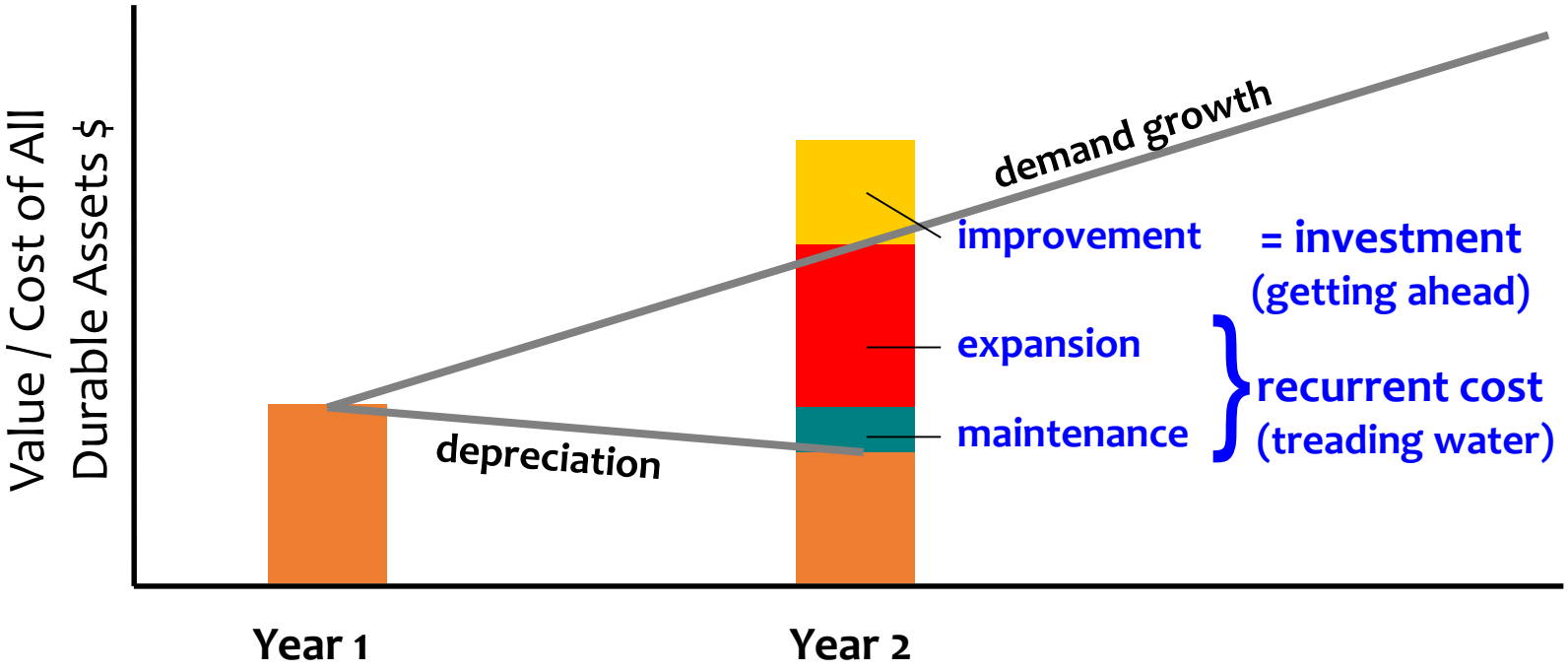
Also depicted for comparison are the UN projections.

3. It's not just a scale factor: A growing population has different economic and social dynamics than a stable one.

The Diseconomies of Population Growth Rate

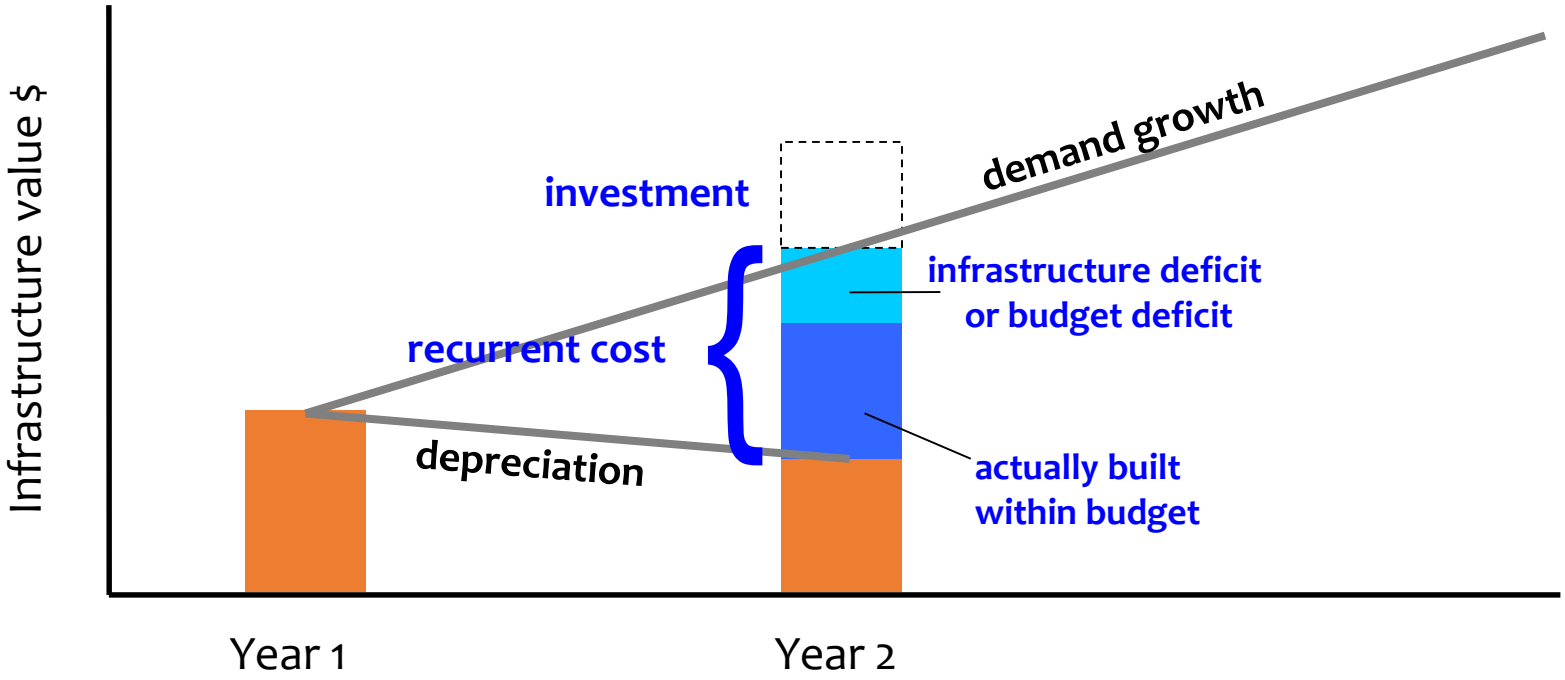
Capacity Expansion is Recurrent Cost

Expenditure on durables is generally regarded as "investment", justifying debt-funding.
But catering for added people is just running to stand still:
at no point in the future does the "investment" pay off.



The Diseconomies of Growth

If we fail to increase inventory at the same rate as population, the shortfall or 'backlog' rapidly reduces access to and quality of services for the whole population.

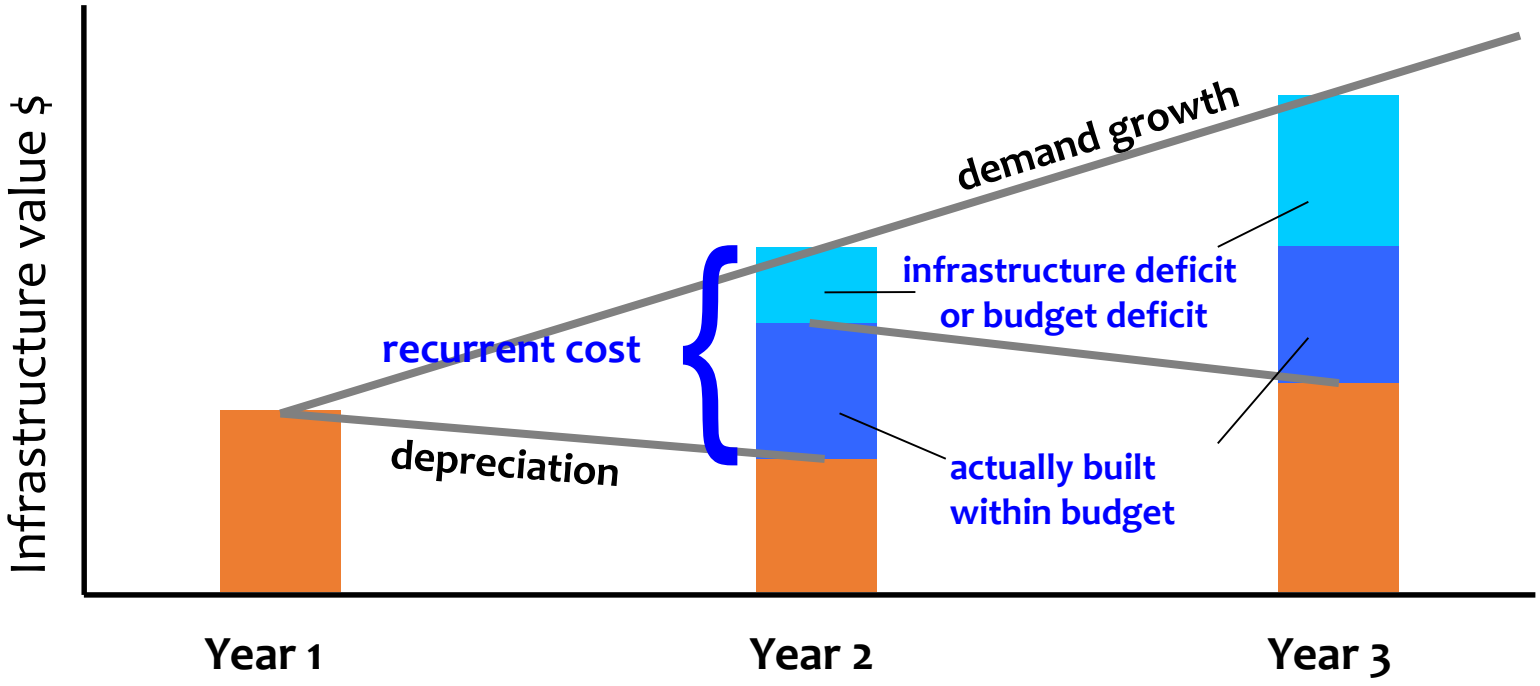


The Diseconomies of Growth

The infrastructure deficit increases from year to year, becoming intractable.

Quality of life is meanwhile declining.

Government borrows to fund major infrastructure 'investment'. But as this is only treading water, ability to pay is not improved by the investment, and further 'investment' is needed each year, escalating debt.



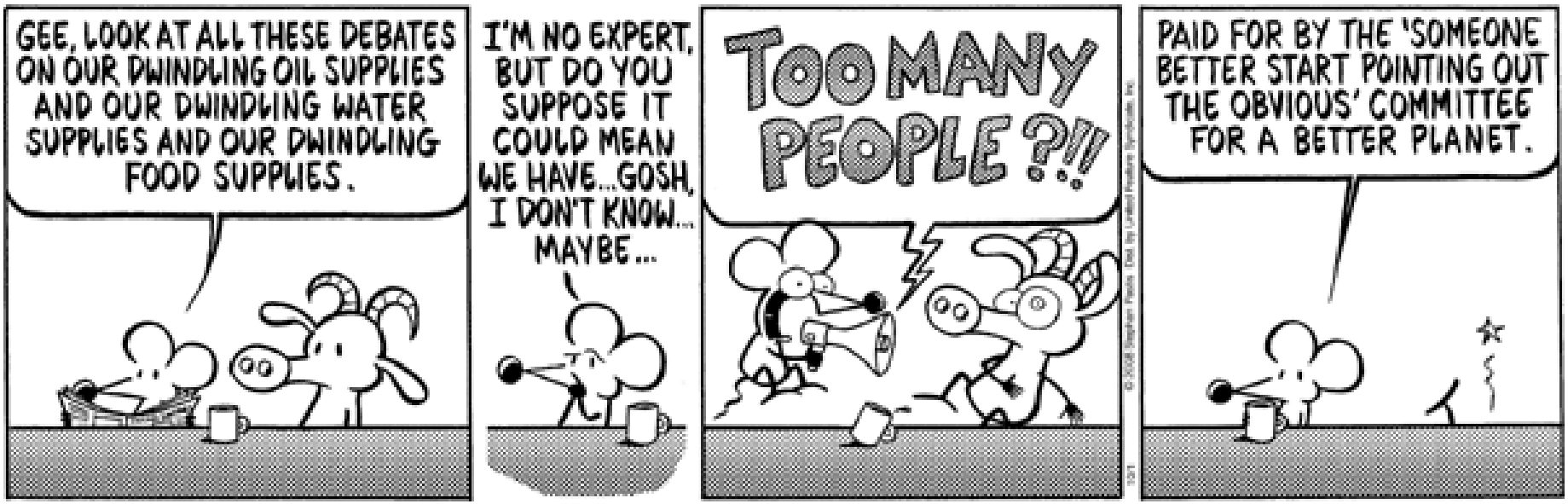
Population growth is unaffordable

Based on actual expenditure and estimated turn-over rates (lifespans),

- Our total durable asset stock is valued at 6.5–7 times GDP.
- Therefore, adding 1% to population per year costs 6.5–7% of GDP.
- In Australia, that's around $0.5 million per added person.
- Public burden is >$100,000 per added person.

Implications for Engineering

- Building more stuff is not a solution.
  - Running to stand still, and digging a debt pit we can't escape from
- An optimised plan has an optimal carrying capacity
  - Our major infrastructure spends half its life inefficiently underutilised, and the other half inefficiently crowded.
- A stable population may have a smaller construction sector
  - Doing much more interesting, leading-edge stuff.
  - In a tight labour market that values your skills.



Thank You!