

Coming Clean

THINK.
CHANGE.
DO

Take home message

UTSpeaks 11 July 2007

From Sydney to Sri Lanka to the Solomon Islands,
it's time for the next revolution in sanitation

[Sanitation = everything that goes into our sewer now]

UTSpeaks 11 July 2007

Disclaimer / Acknowledgements

Ideas developed through many projects, field trips, discussions with insightful colleagues. Particular thanks to

- > Project sponsors: USEPA, WERF, SWC, YVW, MAV, SEW, World Vision Australia, WaterAid Australia
- > ISF: Juliet Willetts, Kumi Abersuriya, Simon Fane, Dana Cordell, Stuart White
- > Nationally: Sarah West, Leigh Davison
- > Internationally: Valerie Nelson, Jerry Stonebridge, Mary Clark, Carl Etnier, Richard Pinkham, Jan Olof Drangert, Petter Jensen

Responsibility rests with me.
Especially for the toilet humour.

Alternative titles



Not for the faint-hearted: a closer look at Australia's real underworld

Making money by going through the motions

Everything you ever wanted to know about sewage and were afraid to ask

UTSpeaks 11 July 2007

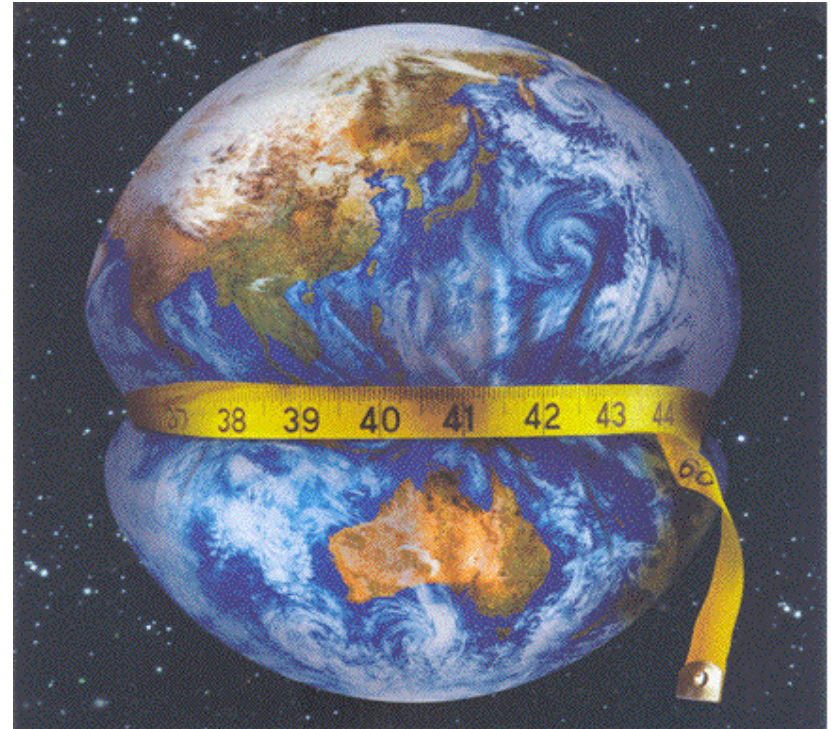
**How many euphemisms do Aussies
have for 'number 2s'?**

**And how much (kg per person) do we
produce each year?**

(there's prizes at the end)

Overview

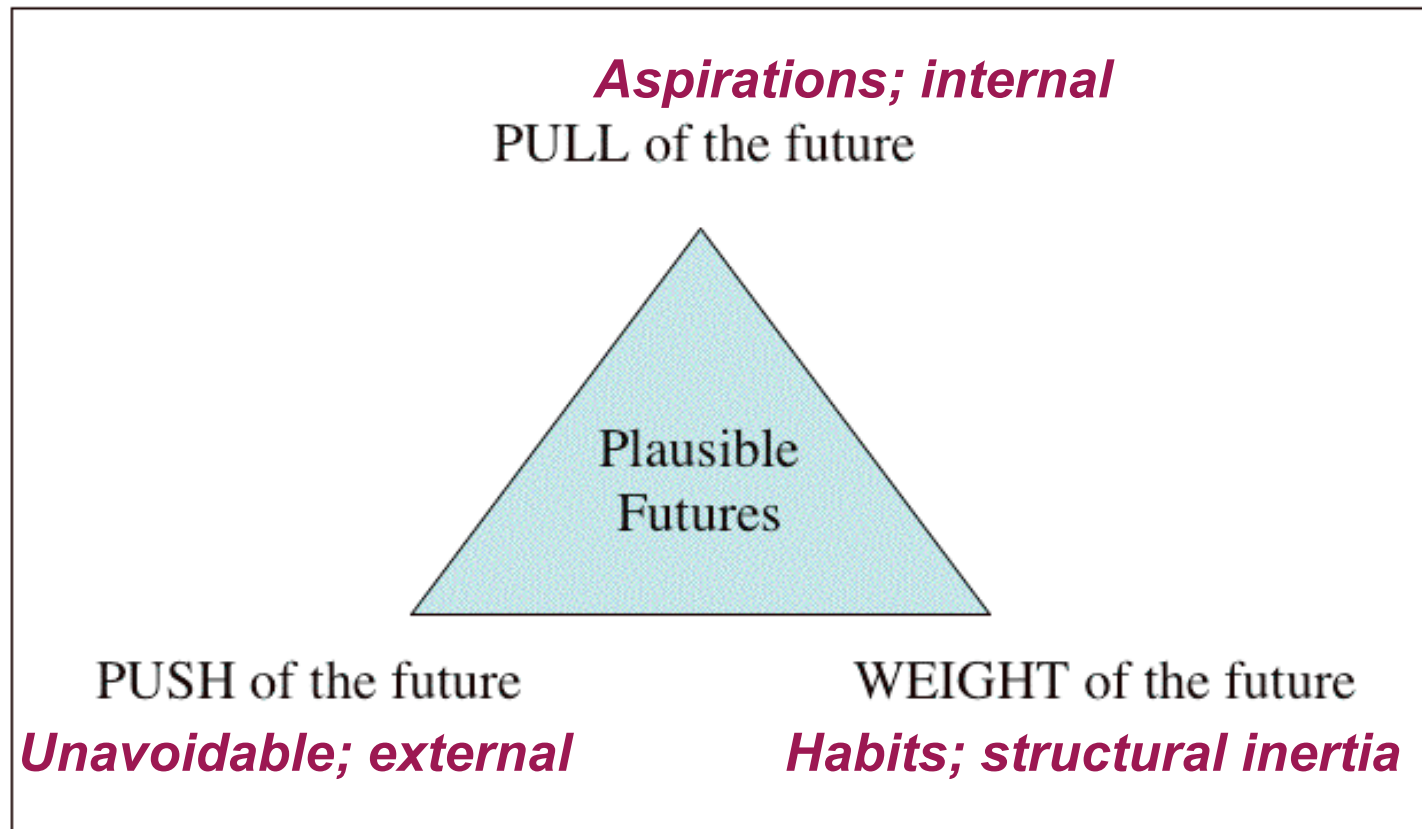
- > Why do we need a revolution?
- > And why do we need it now?
- > What might it look like?
- > How might it work?
- > **Some really cool so-what to wrap it all up...**



Digital Illustration, Irvine Gowans / Getty Images

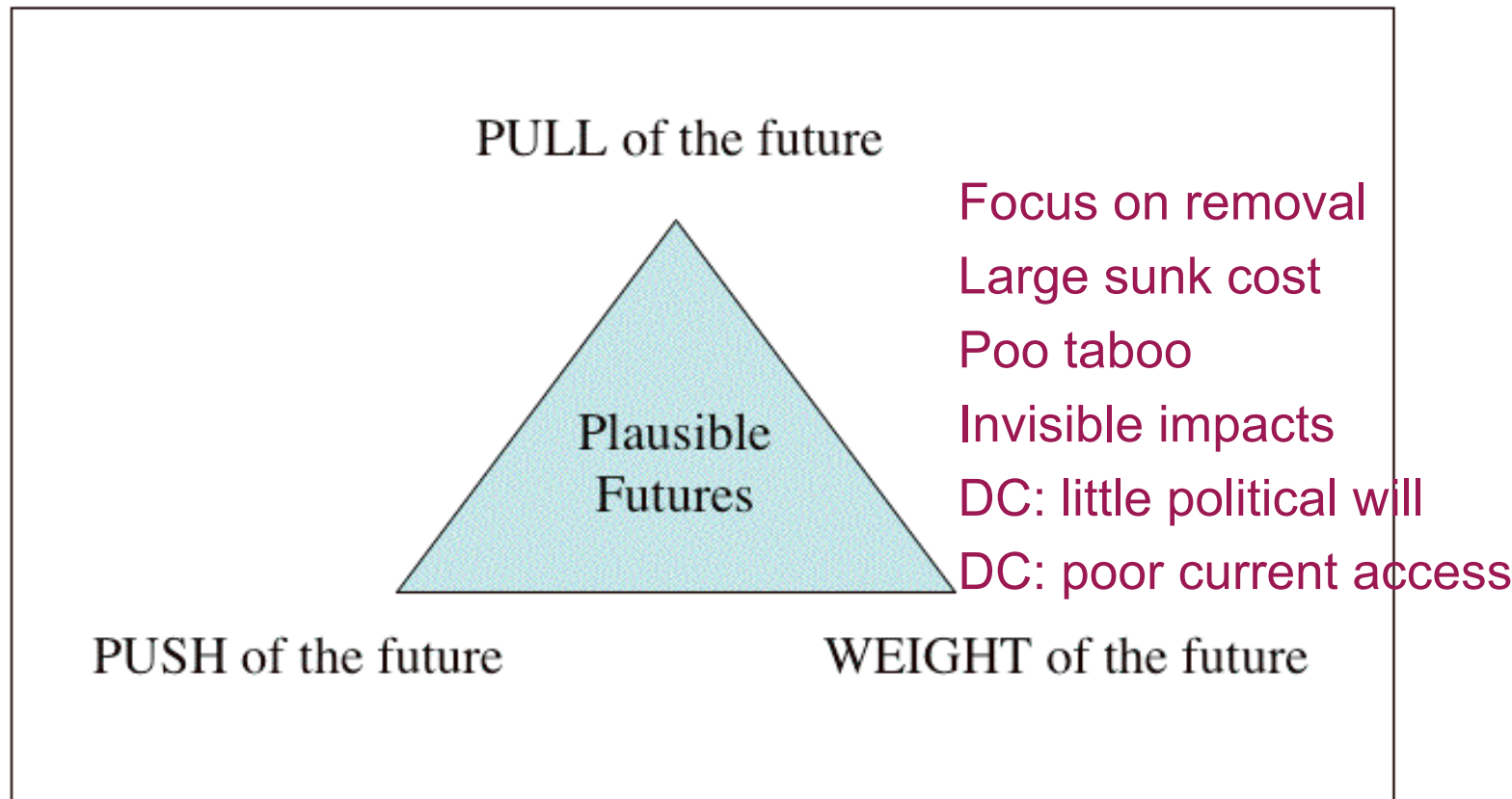
UTSpeaks

Sustainable sanitation: a plausible future?



UTSpeaks 11 July 2007

Sustainable sanitation: the inertia



UTSpeaks 11 July 2007

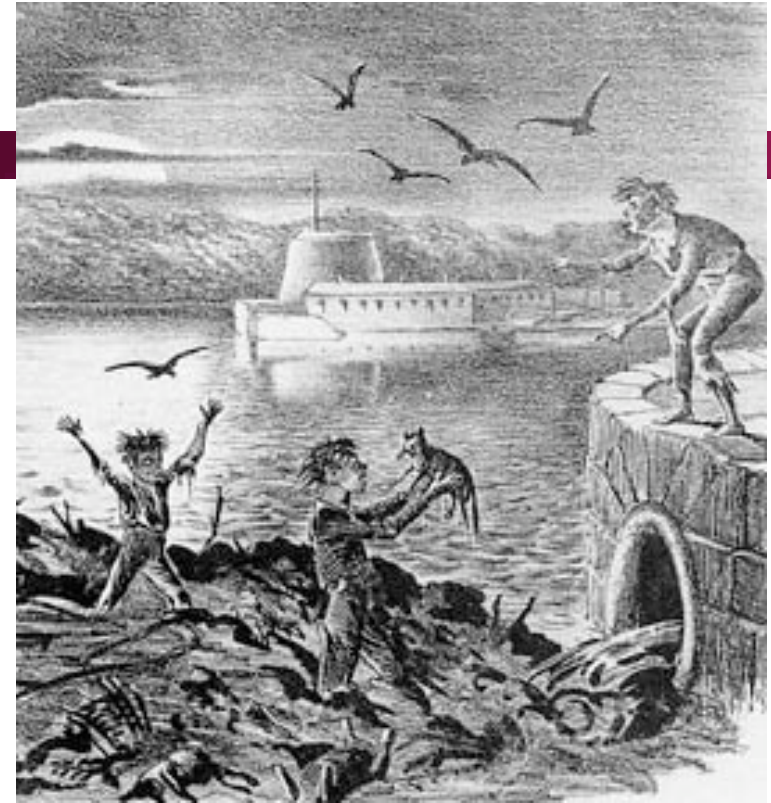
The focus is on removal

Imagine London in the late 1800s

- Urban populations increasing
- Water pumps, some faecal collection
- Miasma theory of disease
- Vote extended beyond land holders
- 'Great Stench' 1858

The response:

- new economic models were devised
- centralised sewers and sewer farms were installed



Child mortality dramatically improved and
centralised sewers became the norm

UTSpeaks 11 July 20

The sunk costs are considerable

- > Most costs are in transport (80%), not treatment
- > As systems age, maintenance and replacement costs soar
- > End-of-pipe treatment entrenches existing investment
- > Linear, large-scale thinking inadvertently promoted



The temptation is always to add incrementally to the existing system.

Poo taboo, though ubiquitous now, is recent, circumstantial, and unhealthy!

Early term for excrement:

laetamen [‘manure’, from *laetare*, ‘to gladden’]

Circumstantial determinants:

1. Attitude to the body and its wastes
2. Supply demand balance of nutrients for agricultural productivity

Urine colour + faecal colour, texture, aroma (!) are simple, effective, fundamental health indicators

It's change-able! It's a serious blockage:
sewage removal = public good = limited (\$) interest

Our impacts are invisible in our day-to-day life

- > Feedback mechanisms missing
- > Impacts occur elsewhere
- > Infrastructure unintentionally encourages 'flush and forget'



Our behaviour
remains
unchanged

UTSpeaks 11 July 2007

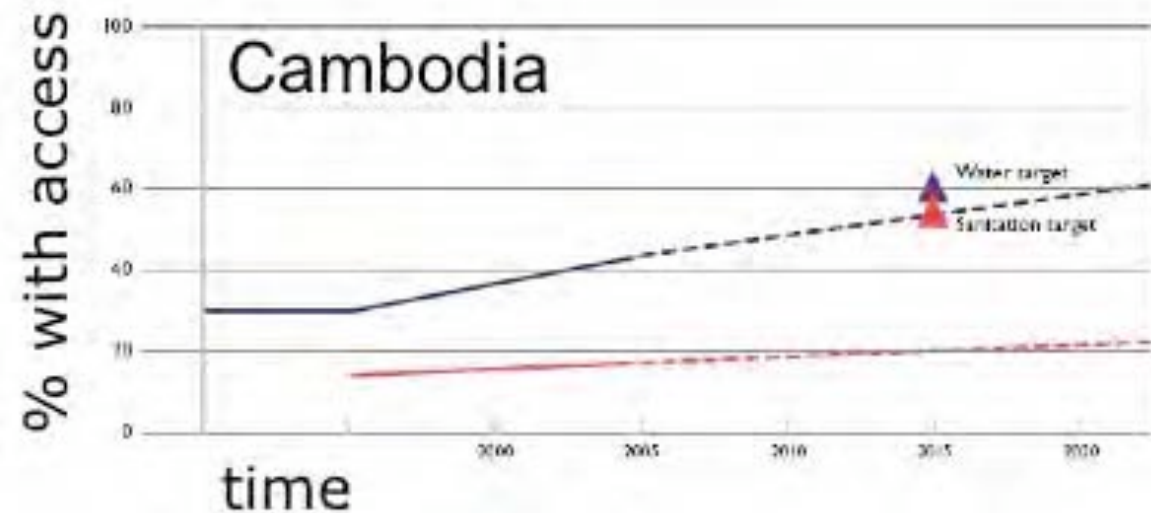
And in developing countries, the situation remains overwhelming

Unclean water is the world's 2nd biggest child killer.

Millennium Development Goal: reduce by half the population without access to adequate sanitation

And what is that population anyway?

- a. 200 million
- b. 500 million
- c. 2.5 billion
- d. 5 billion

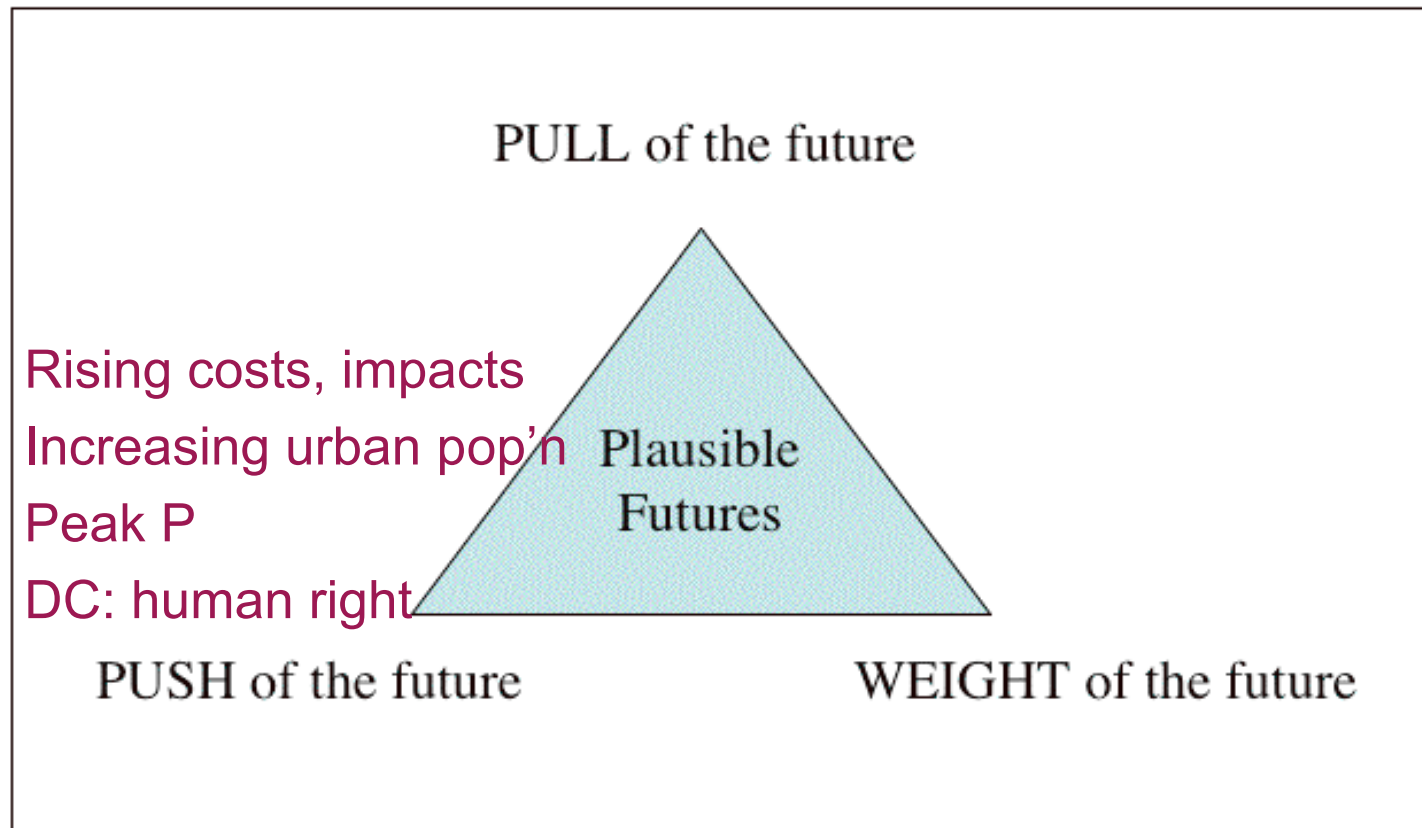


A lack of political will is the primary obstacle

- > Costs are manageable
- > Benefits are demonstrable
- > Recipient country difficulties
- > Donor country difficulties
 - AusAID = half OECD average
 - AusAID watsan commitment = small
 - Netherlands watsan commitment: \$350M pa + 50 million people served by 2015

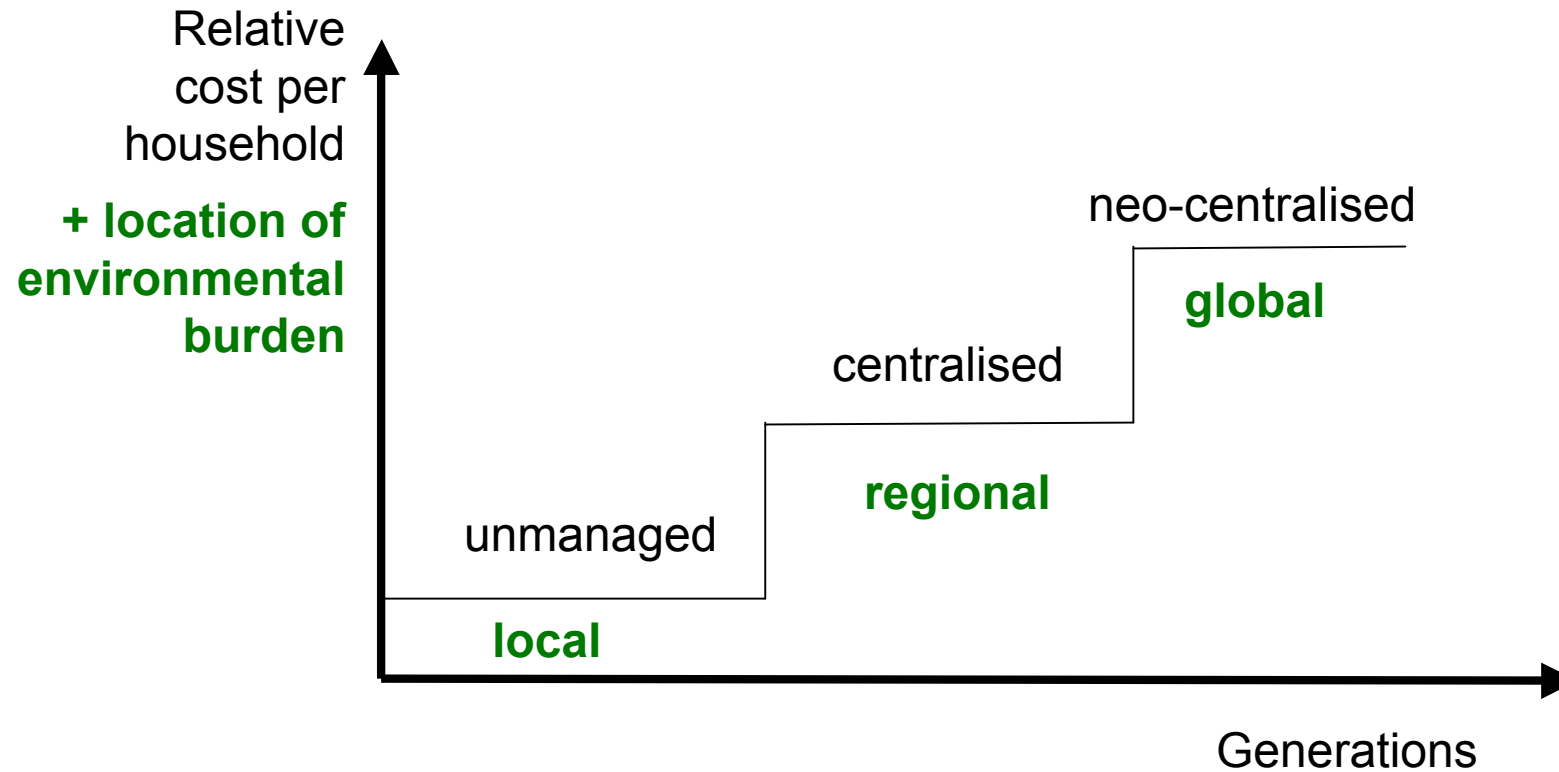
Concerted action is critical.
We should contribute our fair share.

Sustainable sanitation: the inevitabilities



UTSpeaks 11 July 2007

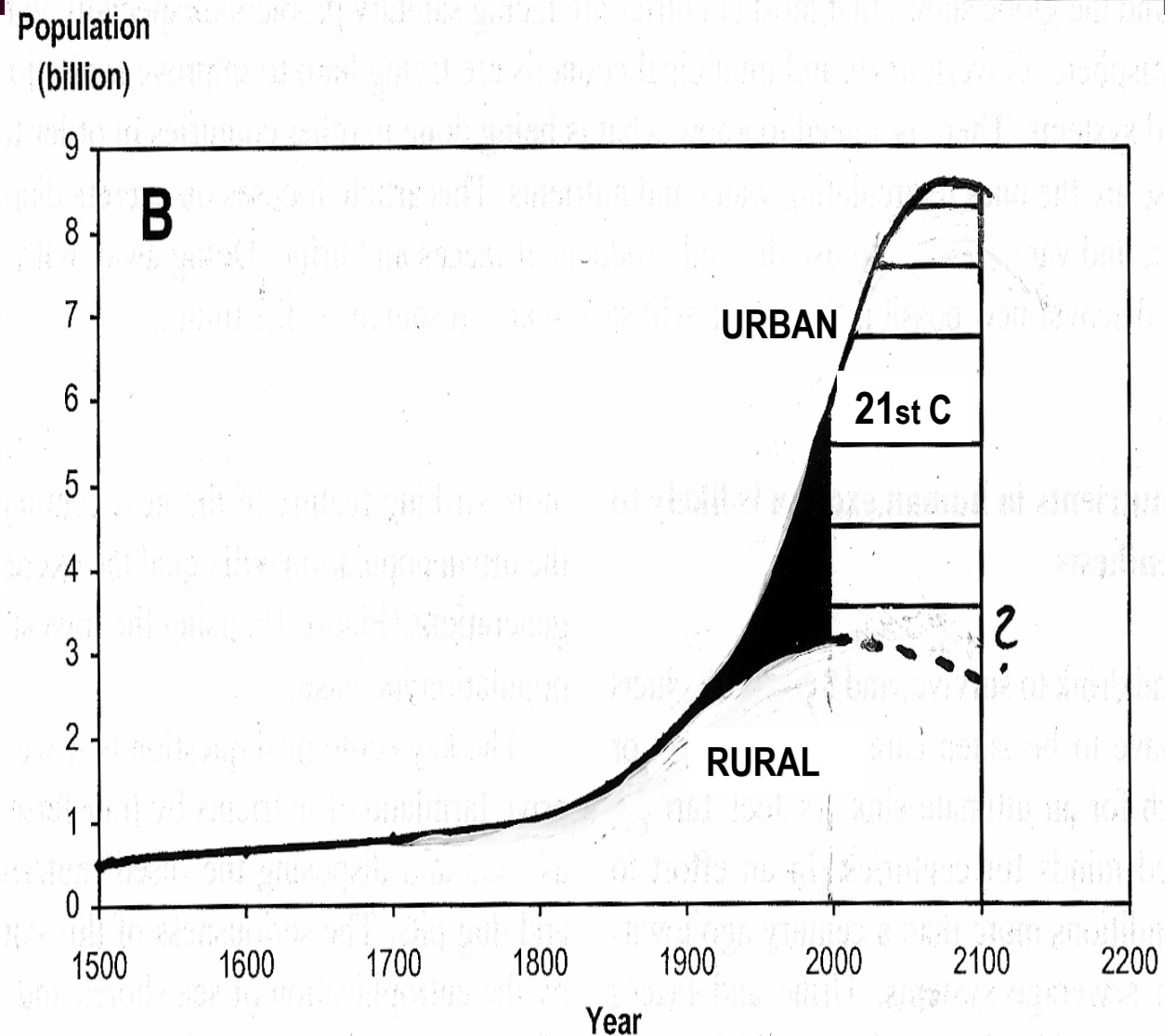
The cost per household increases and the environmental burden shifts



Need cleverer solutions that tunnel through the cost barrier (especially for 'middle income countries') and reduce overall ecological impacts

From 2007, urban dwellers outnumber rural

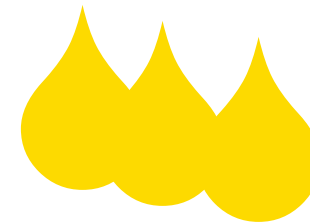
High proportion live in slums: particular sewage challenges



You've heard of peak oil - meet peak P

- > P (phosphorus) is essential for *all* life
- > 90% of P demand is for food production
- > key to food production, and therefore growth of society
- > Projected \uparrow 50% by 2025, \uparrow 100% by 2050
- > Non-renewable! No substitute!
- > At current rates, reserves depleted in 50-100yrs

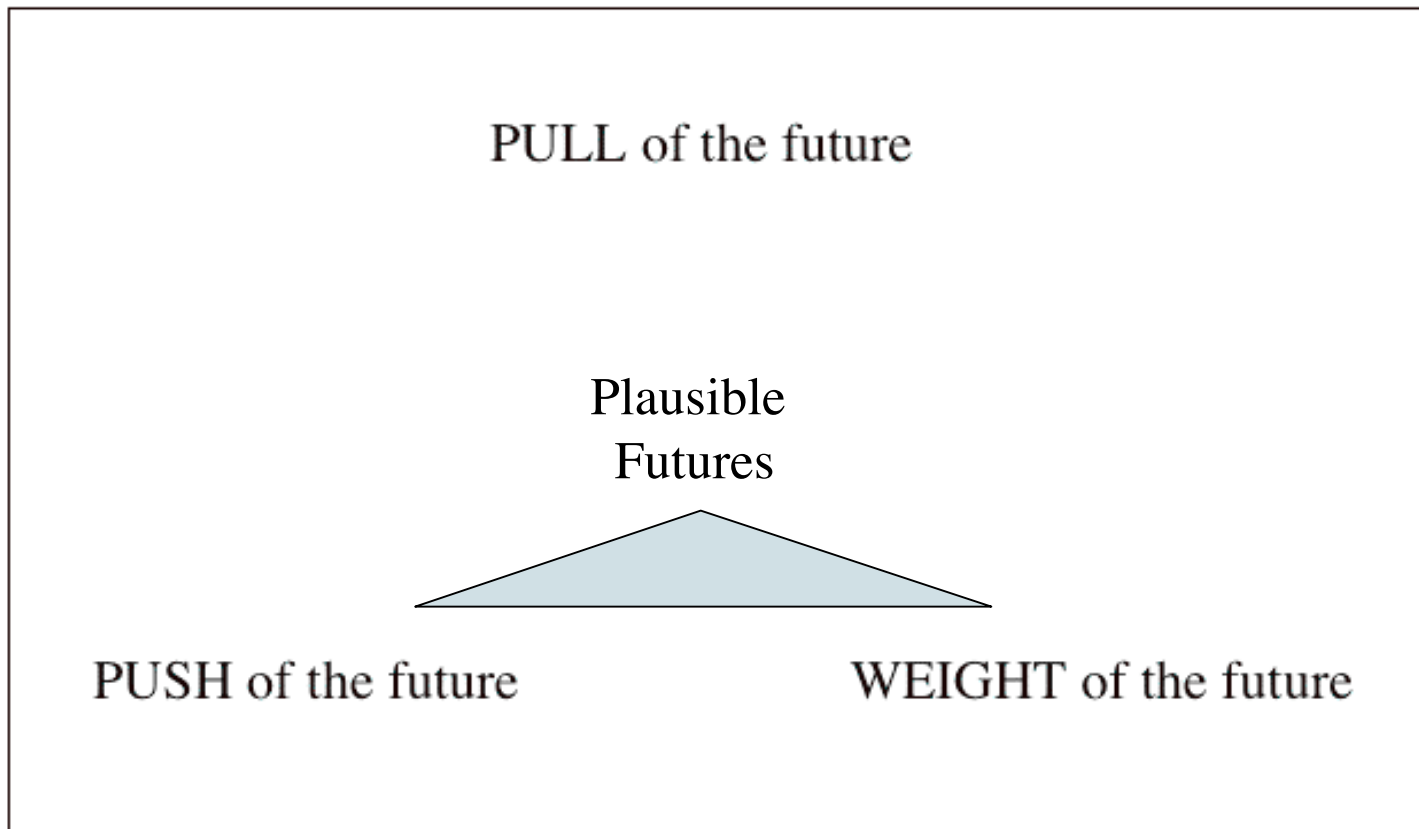
Guess what is a
concentrated P source?



**How many euphemisms do Aussies
have for doing #1s?**

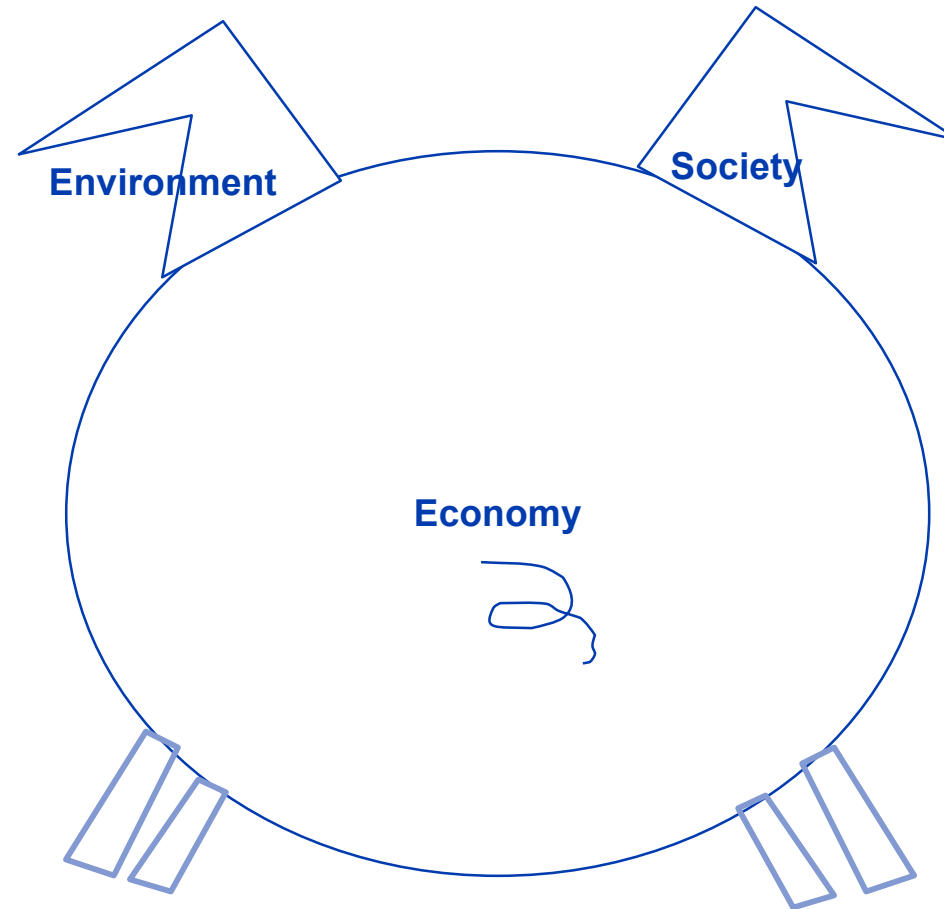
**And how much (litres per person) do we
produce in a year?**

And without a big picture, we run the risk of selling ourselves short...



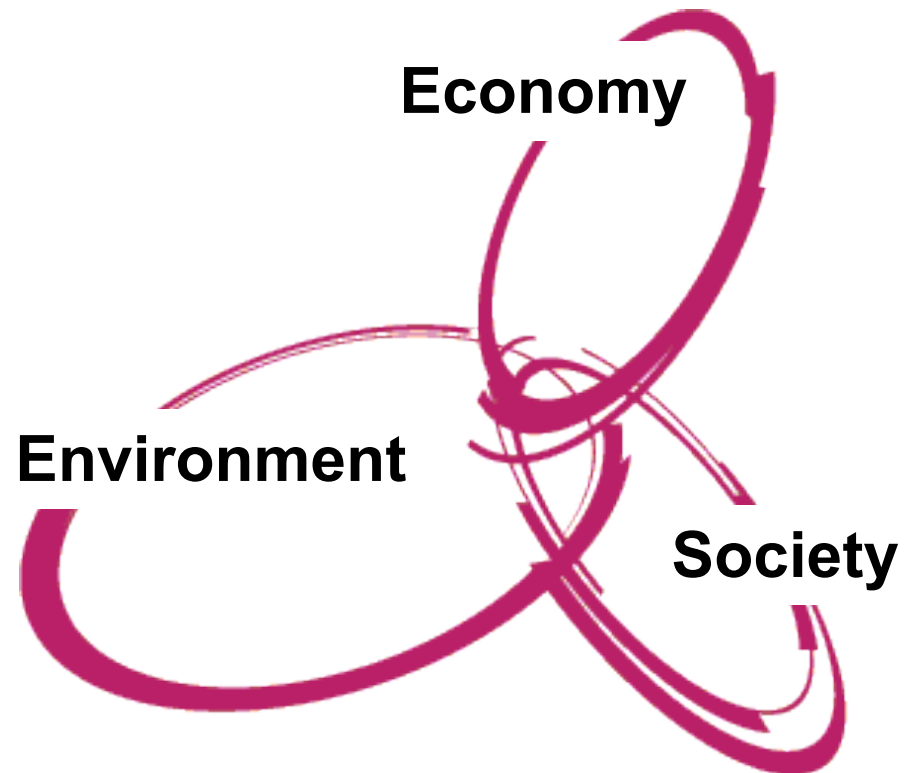
UTSpeaks 11 July 2007

The 'pig's ears' model of sustainability won't help

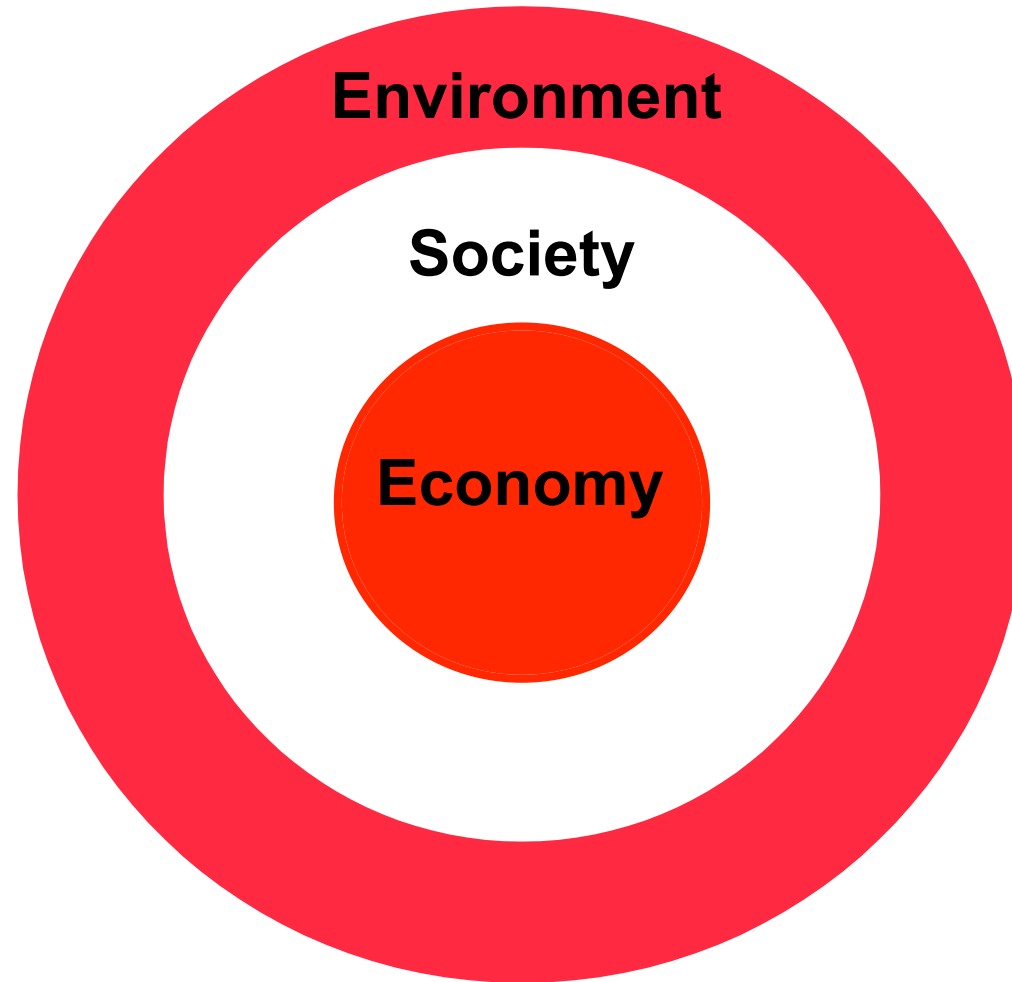


UTSpeaks 11 July 2007

A more balanced vision of a sustainable future



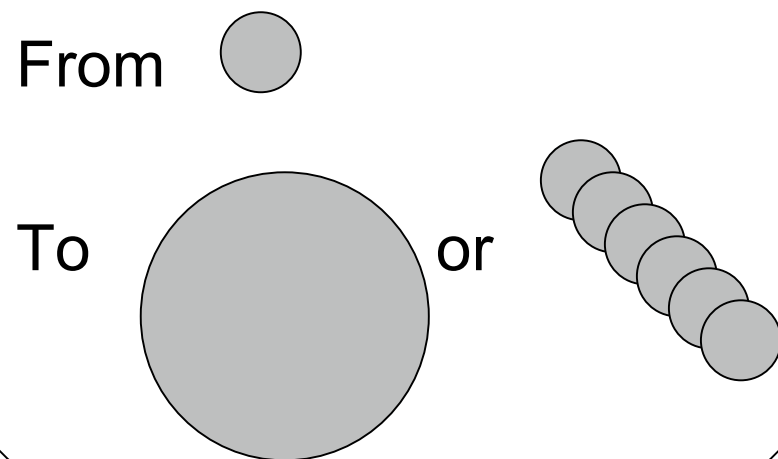
A more sustainable future?



An important distinction: growth or development?

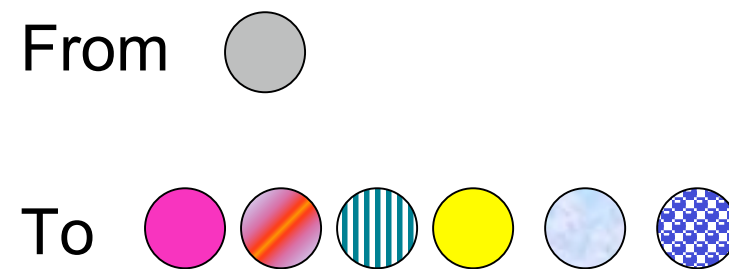
Growth:

An increase in quantity



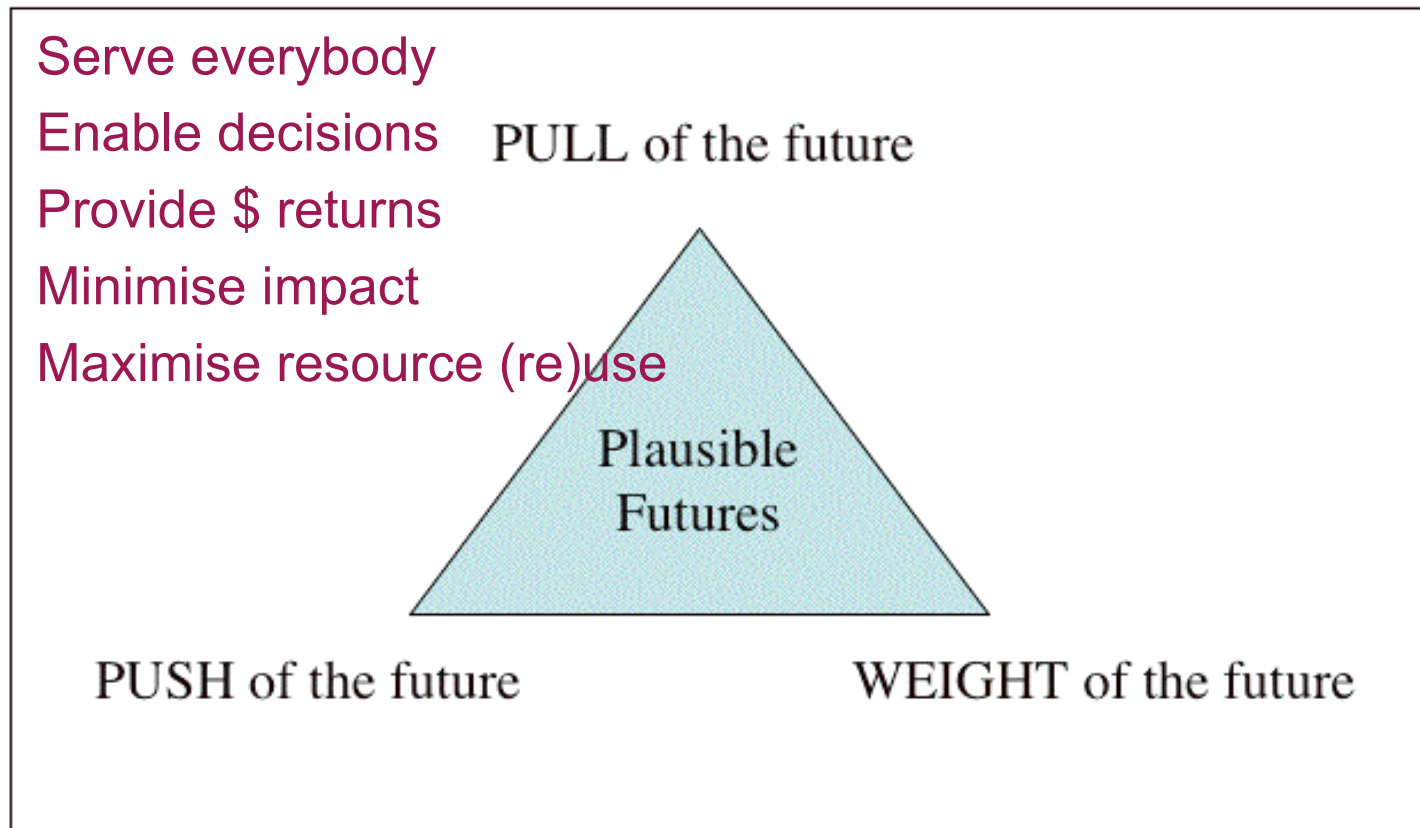
Development:

An increase in quality



The challenge is to work out how to
maximise development and minimise growth

Sustainable sanitation: the aspirations



UTSpeaks 11 July 2007

Calls for this kind of future are increasing

Baltimore Charter: signed by 50 internationally leading researchers, public officials, and private business people in March this year; in use now to secure funds from Capitol Hill

We commit to implementing more sustainable water systems by expanding uses and opening new markets for small-scale treatment processes, advancing research on micro-biological and macro-ecological scales, inventing new technologies based on nature's lessons, creating new management and financial institutions, reforming government policies and regulations, and elevating water literacy in the public.

Requires a trans-disciplinary approach

Leapfrogs in what we use and how we use it are part of a trans-disciplinary approach

- > 'Interfaith dialogue': beyond one size fits all
- > Diverse technologies
- > Diverse scales of service
- > Direct connections with other resource cycles
 - Water
 - Nutrients
 - Organic waste
 - Energy



Start by imagining a different future

Melbourne imagined its 2057 sewage system

To deliver a preferred future,
we must first imagine it.

The future: doing economically
well by doing ecological good.

- > Building in long term planning alongside short and medium term
- > Committed to innovative process and wide-ranging involvement
- > Innovations
 - Zero ‘collateral damage’
 - Decentralised will be significant
 - Find new uses for existing infrastructure
 - Export ‘ways’ and wares’
 - New institutional arrangements
 - New markets

Participants recognised that the transition must start now

Leapfrog technologies transcend taken-for-granted assumptions

Service: clean dishes, cool chardonnay

Water

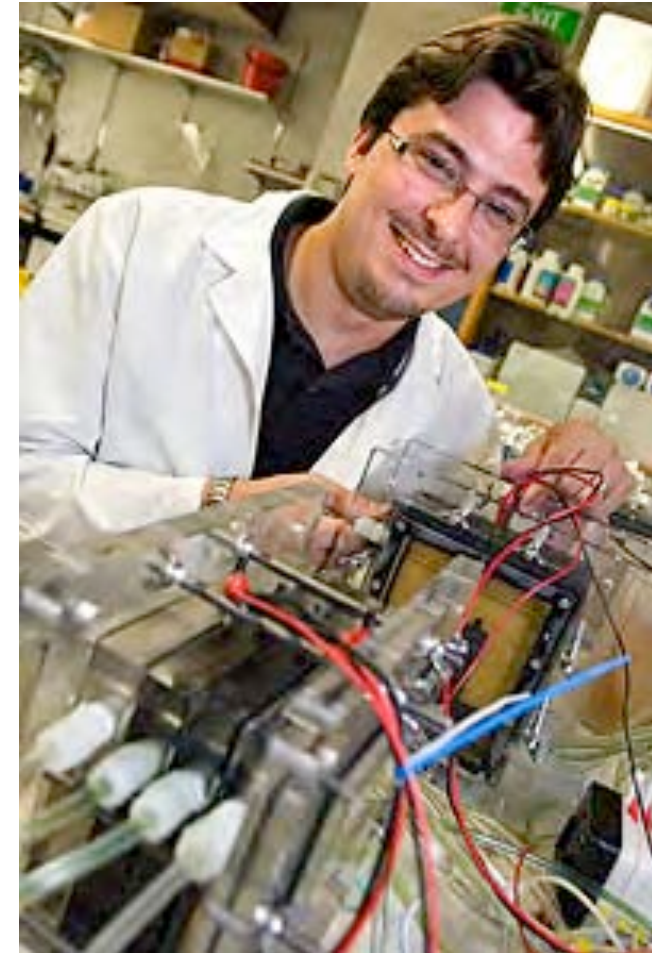
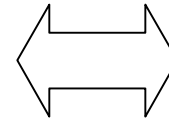
✘ universal solvent; universal conveyor

Energy

✘ Multiple transformations



A solution: supercritical CO2 dishwasher connected to a microbial fuel cell



UTSpeaks 11 July 2007

Leapfrog technologies can exemplify qualitatively different performance criteria



Resilience through drastic increases in material use efficiency and effectiveness; and matching demand with supply



Visibility through closing material loops at the household level; linking across infrastructures



These criteria are consistent with sustainable sanitation



UTSpeaks 11 July 2007

Urine diversion is feasible now

- > Urine separating toilet
plus
- > Separate pipe network
- > Or local collection
- > Or use existing infrastructure



Need to build local experience:
 Trials underway now in Qld (first reports in Sept 07);
 Planning well advanced in Victoria
 And be prepared to work on cultural change

What are the names of these fluffy toys?



And for a
bonus point,
what is their
nationality?

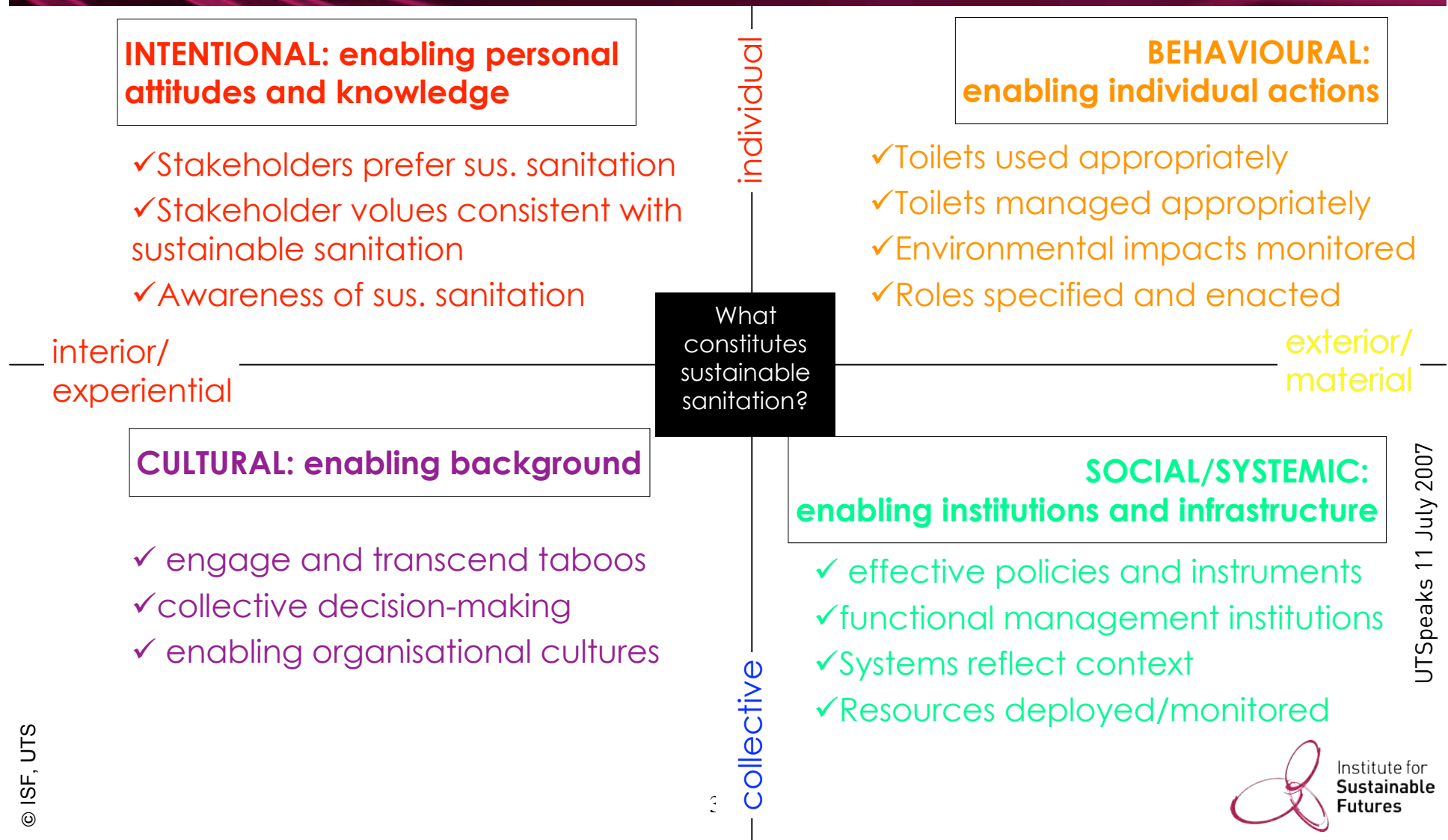
UTSpeaks 11 July 2007

Implementing new ideas means significant institutional and socio-cultural changes

- > New regulations e.g. WHO
- > New markets e.g. nutrients
- > New risks and responses e.g. distributed systems
- > New institutional arrangements e.g. service teams
- > New pricing and payment structures e.g. renewables
- > New decision-making processes e.g. deliberative
- > New interpretations of personal responsibility e.g. behaviours

Lots of useful thinking and doing tools
and insights are available

Wilbur's Integral Theory offers useful insights for developing country applications

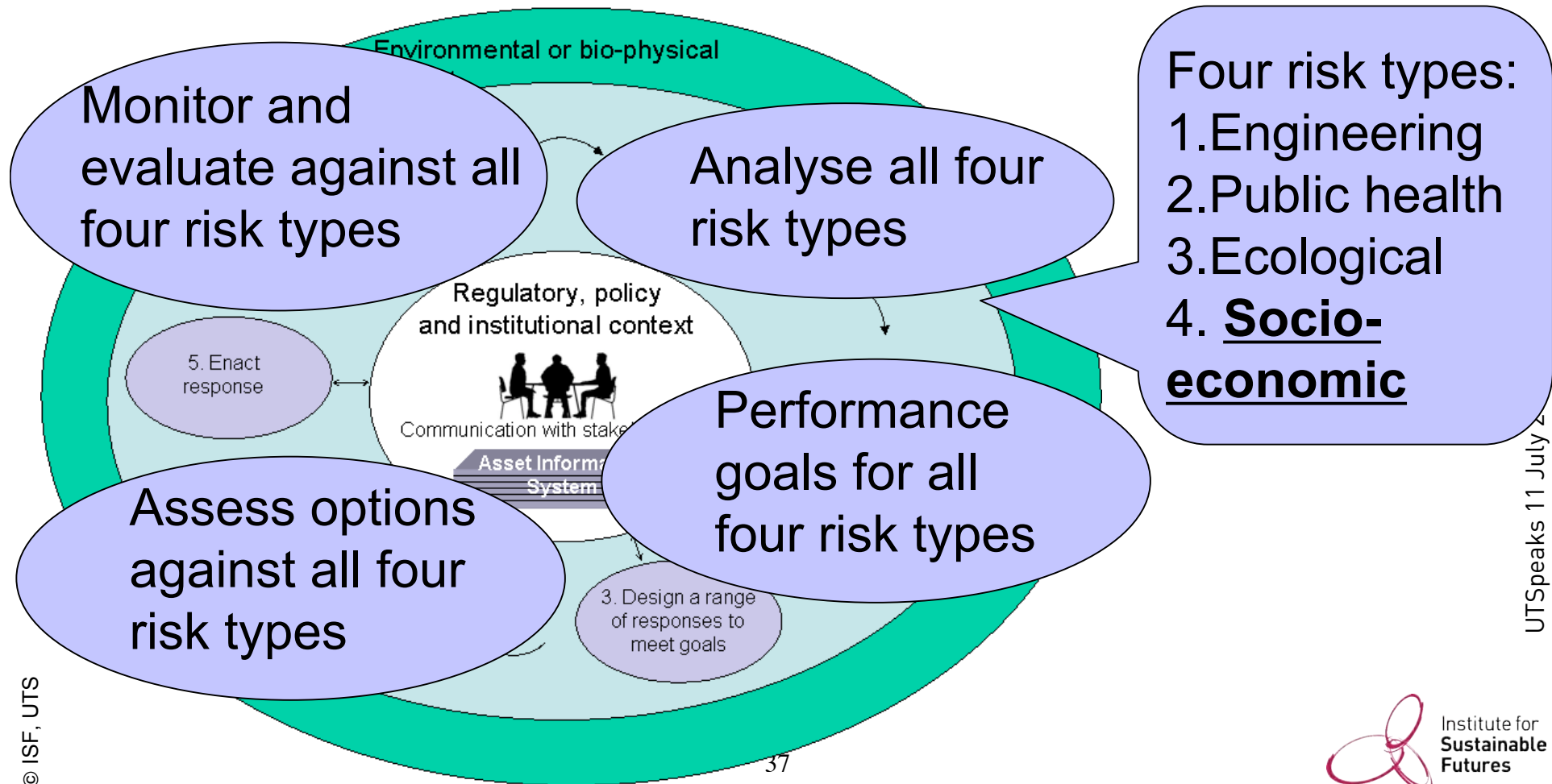


UTSpeaks 11 July 2007

A planning framework for decentralised systems that builds on asset management...

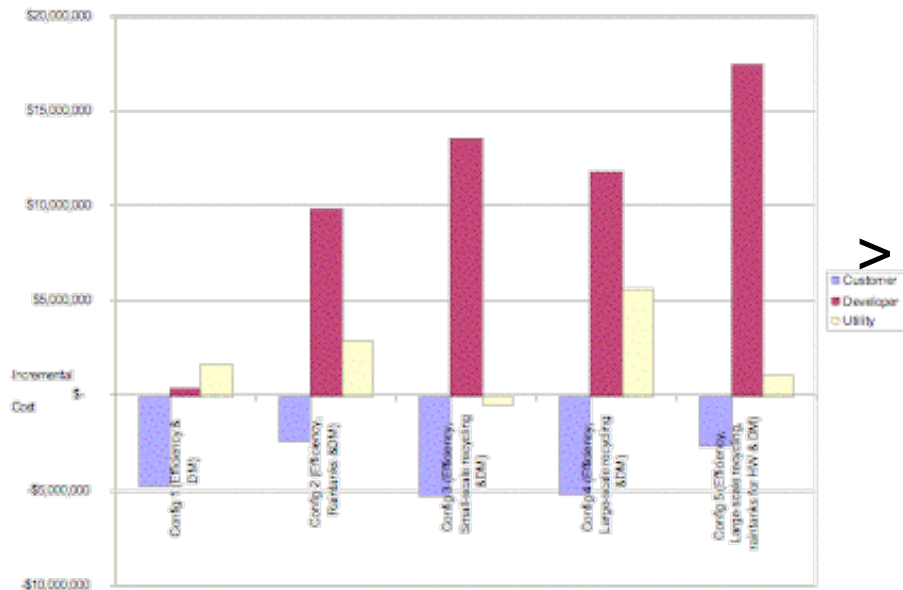


...and on risk management



UTSpeaks 11 July 2014

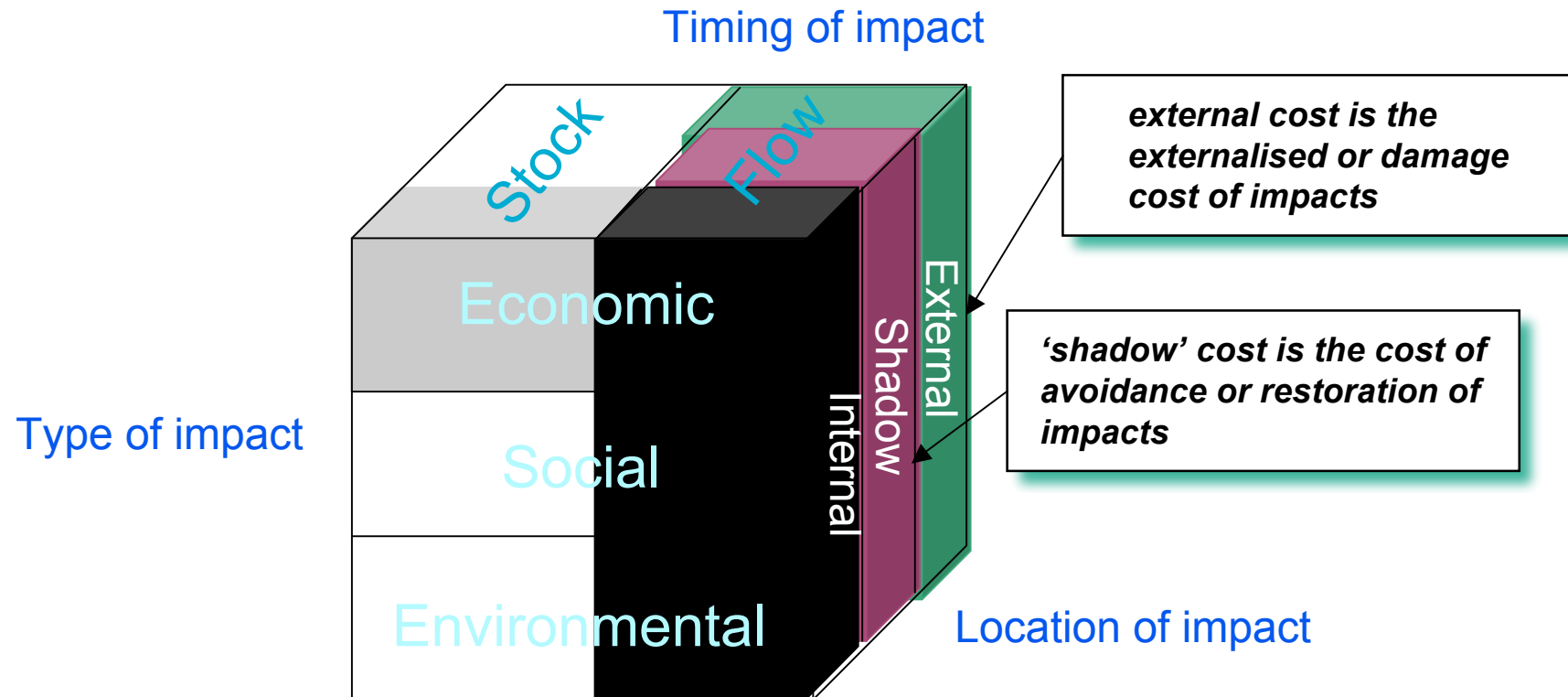
Costing for sustainable urban water outcomes with systems and risk thinking



- > Collaboratively developed principles for costing, expanded with systems and risk thinking
- > Structured to enable transformational adult learning about how to manage key institutional arrangement questions

Defensible basis for comparison between options, projects and organisations

Sustainability accounting broadens reporting and thinking *



Helps to direct investment in effective outcomes

And what if all this was reality?

- > Give opportunity for fulfilling life to billions
- > Avoid repeating economic and ecological mistakes in developing countries

- > World leading technologies and arrangements right here in Sydney
- > Significant export market opportunities
- > Local urban agriculture
- > New concepts in local markets:
e.g. Personal nutrient trading

peebay

UTSpeaks 11 July 2007

Take home message, and a call to action

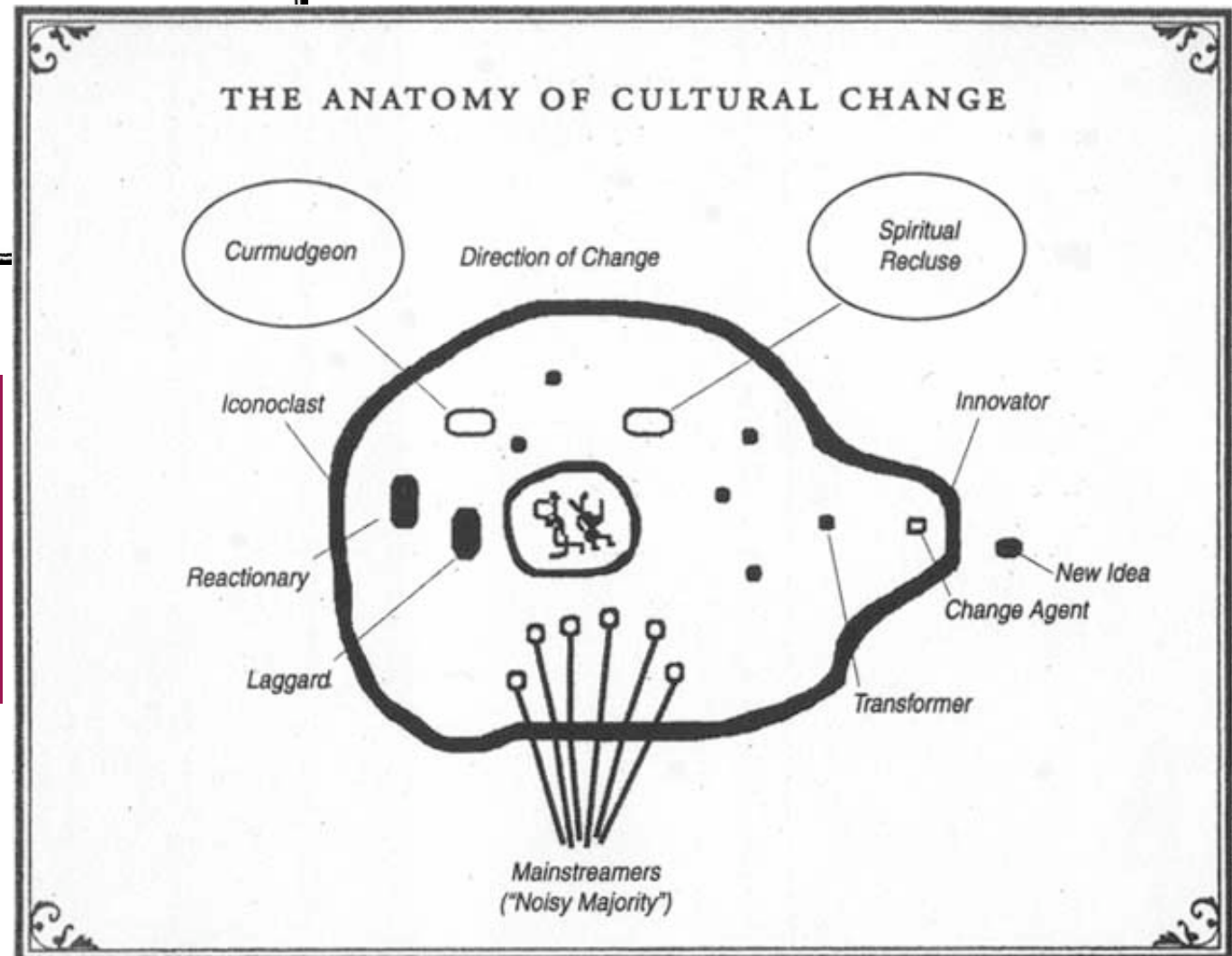
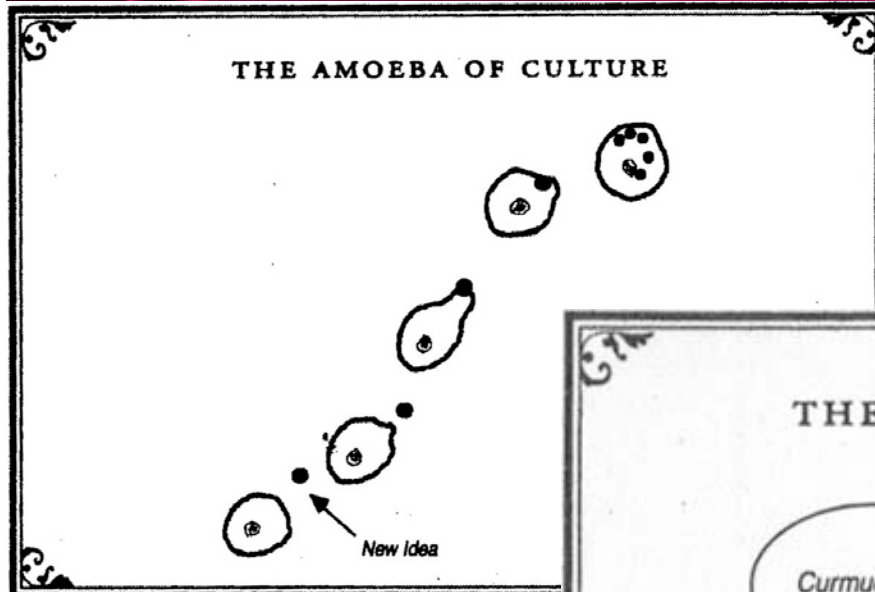
It's time for the next revolution in sanitation:

For the Solomon Islands, separate water from sanitation, connect it to health and hygiene, and consider ecological outcomes

For Sri Lanka, draw on age-old Buddhist principles to design an economically-viable sanitation industry that provides a string of marketable products

For Sydney, bring focus to a long term sewage vision, start experimenting with leading edge infrastructure, use the new legislation to open up new opportunities.

Cultural Change and Diffusion of Innovation



Our role is
'change
agent'.
What's yours?

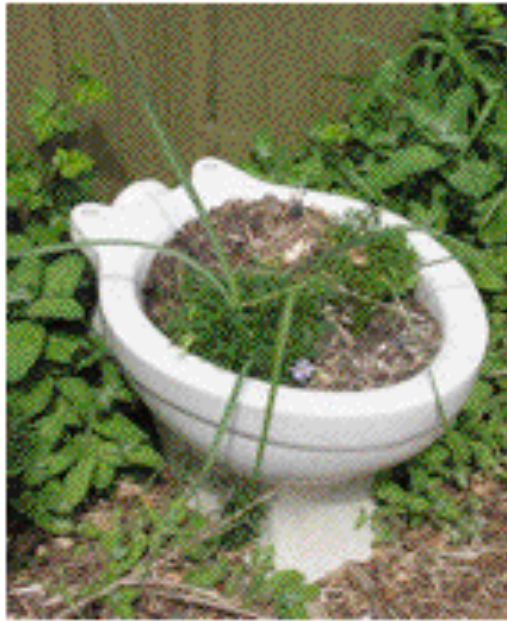


804 *Humus Scent*, Mixed media, 60.5 x 49.5 cm, Algajola (Corsica), 1979

**We can choose:
‘away from’
or
‘towards’**

UTSpeaks 11 July 2007

Trivia answers



1. #2 euphemisms? I found 35
2. 50 kg faeces per person per yr
3. Multiple choice: (c) 2.5 billion, or so
4. #1 euphemisms? I found 30
5. 500L urine per person per yr
6. The characters are 'poo' (Bajs) and 'pee' (Kiss) (really!)
7. They're Swedish
<http://www.peeandpoo.com/eng/flashing.asp>

To find out more about our
postgraduate program and our
transdisciplinary research,
check our website:

www.isf.uts.edu.au

Or contact me directly

Cynthia.Mitchell@uts.edu.au

02 9514 4950

