What are the forces that stop us from selecting more sustainable methods?

What is to be sustained? Why should it be sustained.

13th November2012

Presented by Neil Ridley

It is a miracle that curiosity survives formal education. - *Einstein*

1. *How many people will you influence in your professional life as an educationalist*
2. *What do you think the world of work will be like in 2030?*

Thinking about students you are teaching now:

a) *What year will they retire.*
b) *What year (approx) will they be influencers in the world of work.*

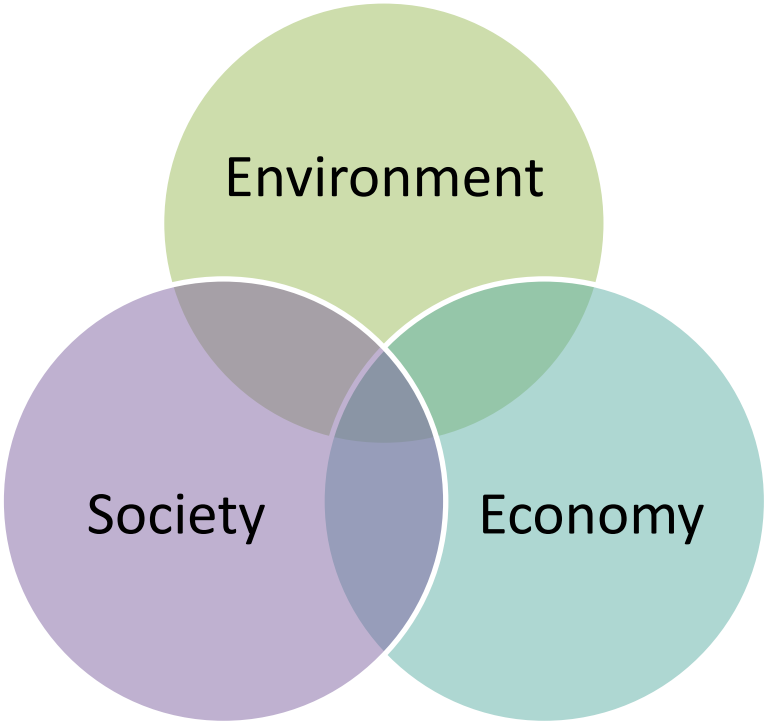
Workshop Objectives

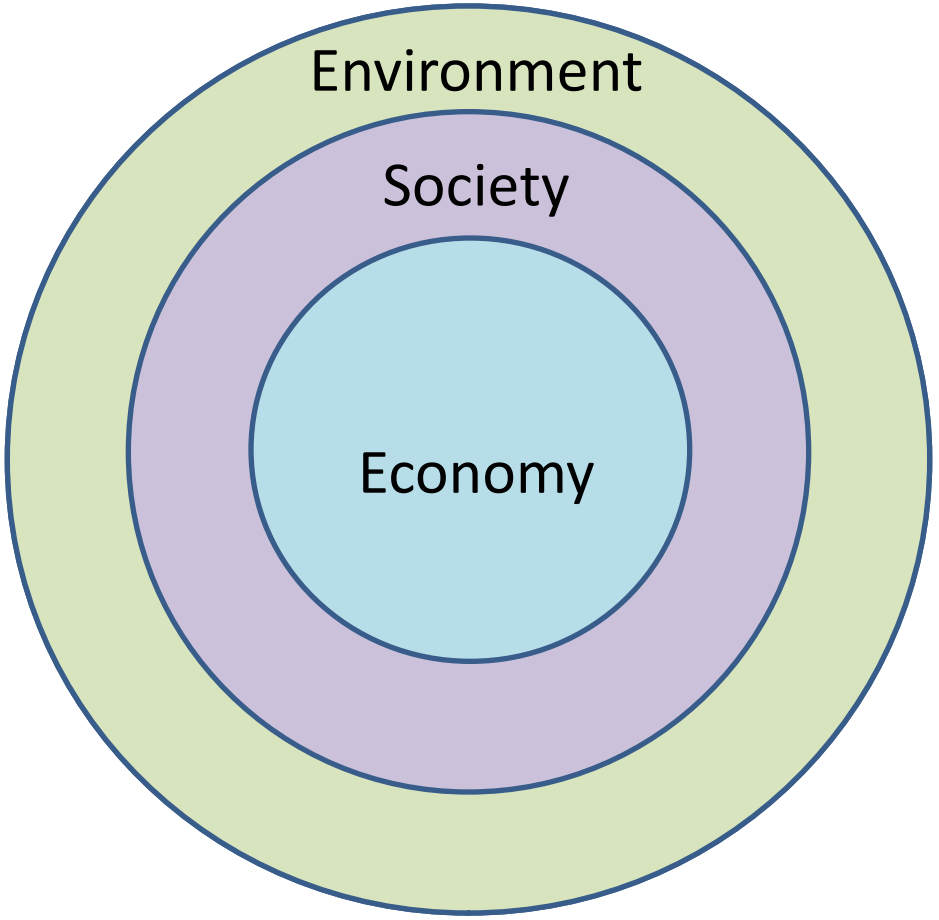
- You will implement theory into practice
- You will understand the use and misuse of the concept of sustainability
- You will understand how to embed sustainability into your teaching
- You will understand why sustainability is fundamental to resource use.

- What is Sustainability?
  - Defined by the Bruntland Commission in 1987

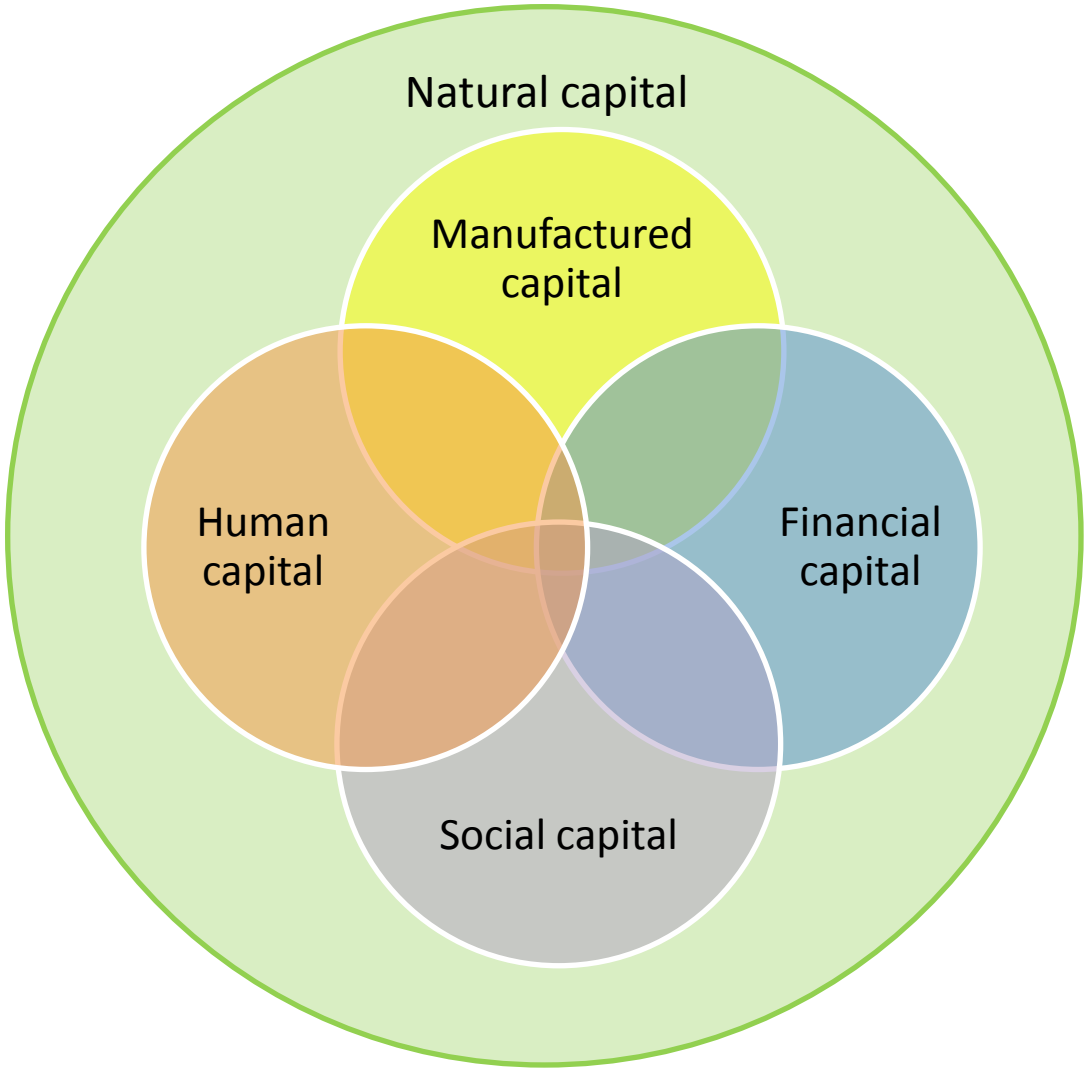
“development which meets the needs of the present without compromising the ability of future generations to meet their own needs”

The pillars of sustainability





Capital broken down into elements for discussion



Take some time to think about this and write down what you think

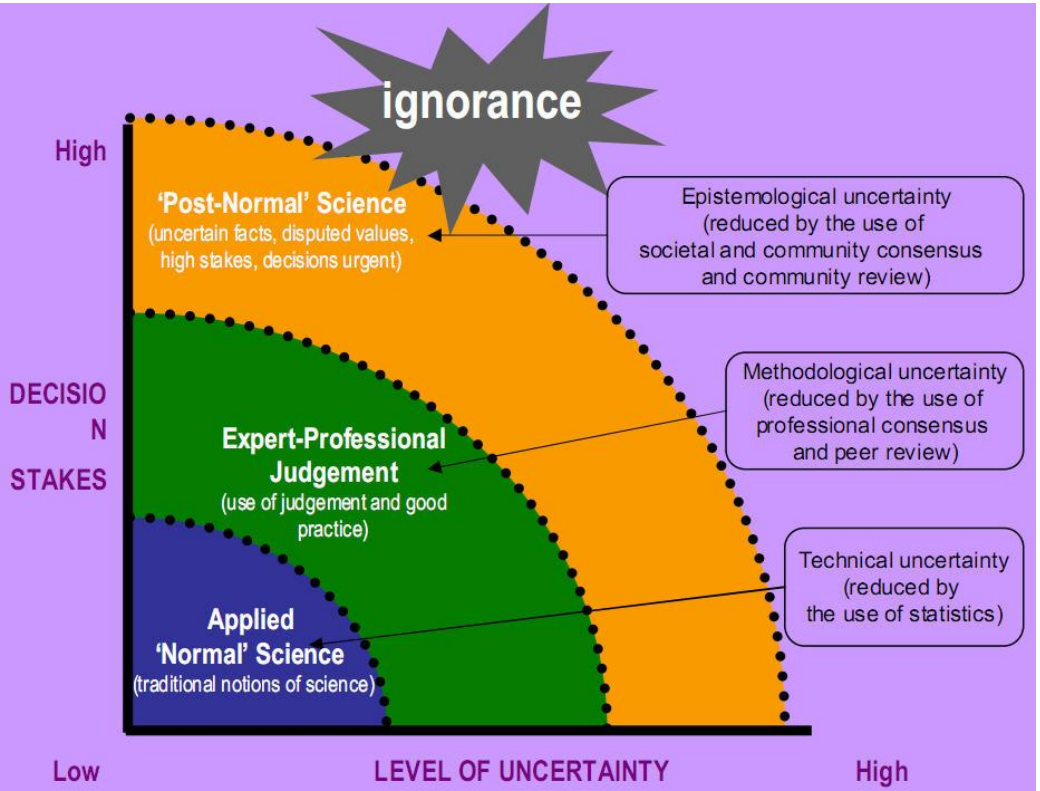
Sustainability is about allocation of resources

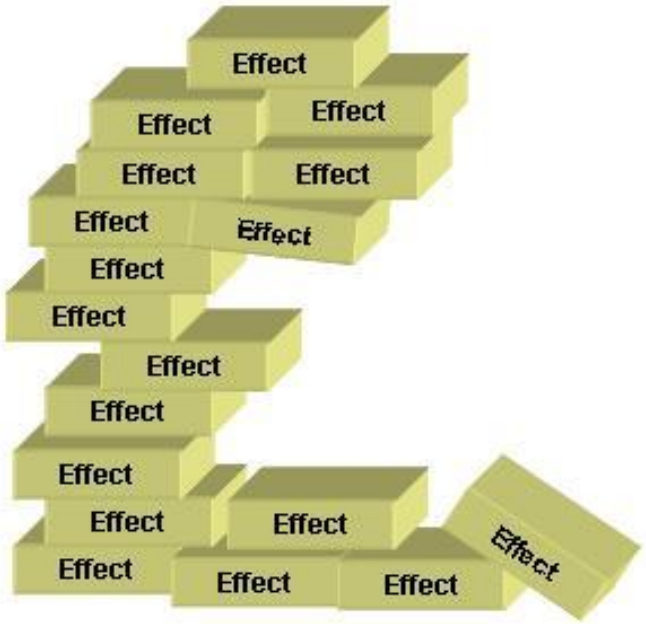
1. What are the resources we are interested in here?

2. What are the 10 most used physical resources used by people

We refer to this as Wicked Problems

Wicked problems: where society cannot agree on either the problem definition or the solution





The modern dilemma

- Growing recognition that Natural resource systems and social systems are complex, unpredictable and highly dynamic
- Different people and groups have different values, viewpoints and priorities that are equally valid.
- Yet we continue to search for standard solutions that achieve steady states

Systems Thinking

- Background
  - has its foundations in work carried out by Professor Jay Forester in 1956
  - recognised the need for a better way of testing ideas about social systems, in the same way we can test ideas in engineering
  - developed a process which allows people to make explicit understanding of social systems and improve them

Systems Thinking

- Background
  - traditionally analysis had focused on separating the individual pieces of what is being studied
  - does not take into account that any changes made to an individual piece will have an impact on the bigger picture
  - as a result when asked to think about the bigger picture we reconstruct the individual pieces

Systems Thinking

- What is systems thinking?

  "Systems thinking is a discipline for seeing wholes, recognising patterns and interrelationships, and learning how to structure those interrelationships in more effective, efficient ways" *Peter Senge*

- When you understand how a system is made up, its structure, you can influence and predict events

Systems Thinking

- Linear thinking
  - this type of thinking leads people to see things as, cause - effect - stop (or action)
    - e.g. crop damage from insect a (cause) - reduced yield (effect)- increase use of pesticide (action stop)
  - does not take into effect the impact of this action
    - e.g. yield reduced further because insect ‘A’ was a predator - insects ‘B’ and ‘C’ increased dramatically

Systems Thinking

- Interrelated thinking
  - this type of thinking will move you towards seeing the bigger picture
  - following the systems thinking approach you can see everything you do will have another impact
  - allows you to visualise the connections

Systems Thinking

- Characteristics of a system
  - consists of definable elements
  - between the elements there are (mostly functional) interrelations
  - every system has a boundary to the surrounding “environment” which is more or less permeable
  - it is at the boundary where we can see what enters and leaves the system
  - systems have a dynamic behaviour over time - the behaviour is often related to the aim of the system

Systems Thinking

- Principles of systems thinking
  - everything can be connected to everything else
  - ***we*** draw the boundaries to define the systems and subsystems we study
  - all actions have feedback - these influence our next actions
  - we live in systematic circles of feedback loops and not static (cause - effect - stop) lines
  - you can never only do one thing

Systems Thinking

- Can you give examples of systems?

?

Systems Thinking

- Examples of systems
  - you
  - a plant
  - a business
  - a car
  - the weather
  - a government
  - a management team
  - a house

Systems Thinking

- There are multiple levels of explanation for any complex situation:
  - Systemic structure (generative)
  - Patterns of behaviour (responsive)
  - Events (reactive)
- With a systems thinking approach we focus on the generative which will have a longer lasting and more profound effect on any situation (rather than focusing on patterns or events)

Systems Thinking and Sustainable Development

- Putting the theory into practice
  - examine a system that is familiar to us all!
  - concentrate on stages one and two of the learning action matrix
  - examine the system with special attention to the impact of the system on the environment
  - draw on personal experience

Systems Thinking and Sustainable Development

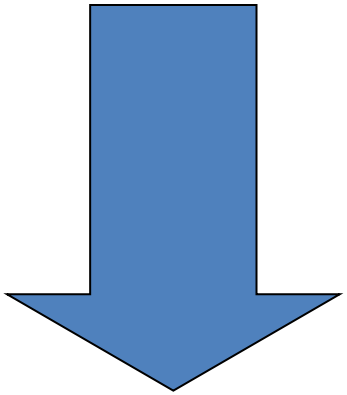
- Your home
  - work in pairs
  - decide on key elements of your household and examine subsystems
  - do not worry about completing your assessment of the full house!
  - remember people live in the house!

Sustainable Development and Business

- What are the business benefits of becoming more sustainable?

Discipline area and link to consumer

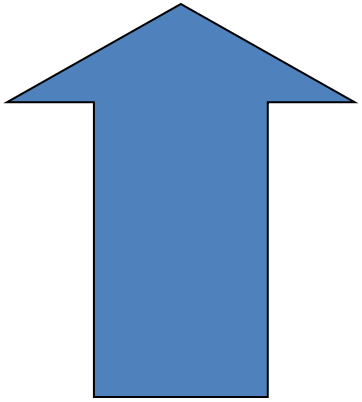
Sustainability has a push and pull contact.



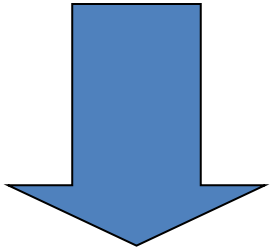
Where consumer asks for example

how many miles has this bouquet of flowers travelled, then the learner centred outcomes take on sustainability as there is all the relationships of biophysical, economic, ethics, culture, aesthetic and institutional here

Stepping Up in Sustainability



Legislation
Supermarket schemes
Environmental schemes



Mechanistic responses car sharing,

but activity is not sharing

Empirical response

for example on nutrient planning for crops

Sustainable Development and Business

- Survey of 481 senior European and American executives
- 94% believe SD is important
  - 36% improved profits
  - 23% new products or services
  - 12% new partnerships, managing stakeholder expectations
  - 10% improved performance through organisational learning

In A 'VUCA' World, Unilever Bets On 'Sustainable Living' As A Transformative Business Model

VUCA what is this?

Volatility

Uncertainty

Complexity

Ambiguous

The Unknown
As we know,
There are known knowns.
There are things we know we know.
We also know
There are known unknowns.
That is to say
We know there are some things
We do not know.
But there are also unknown unknowns,
The ones we don't know
We don't know.
—Feb. 12, 2002, Department of Defense news briefing

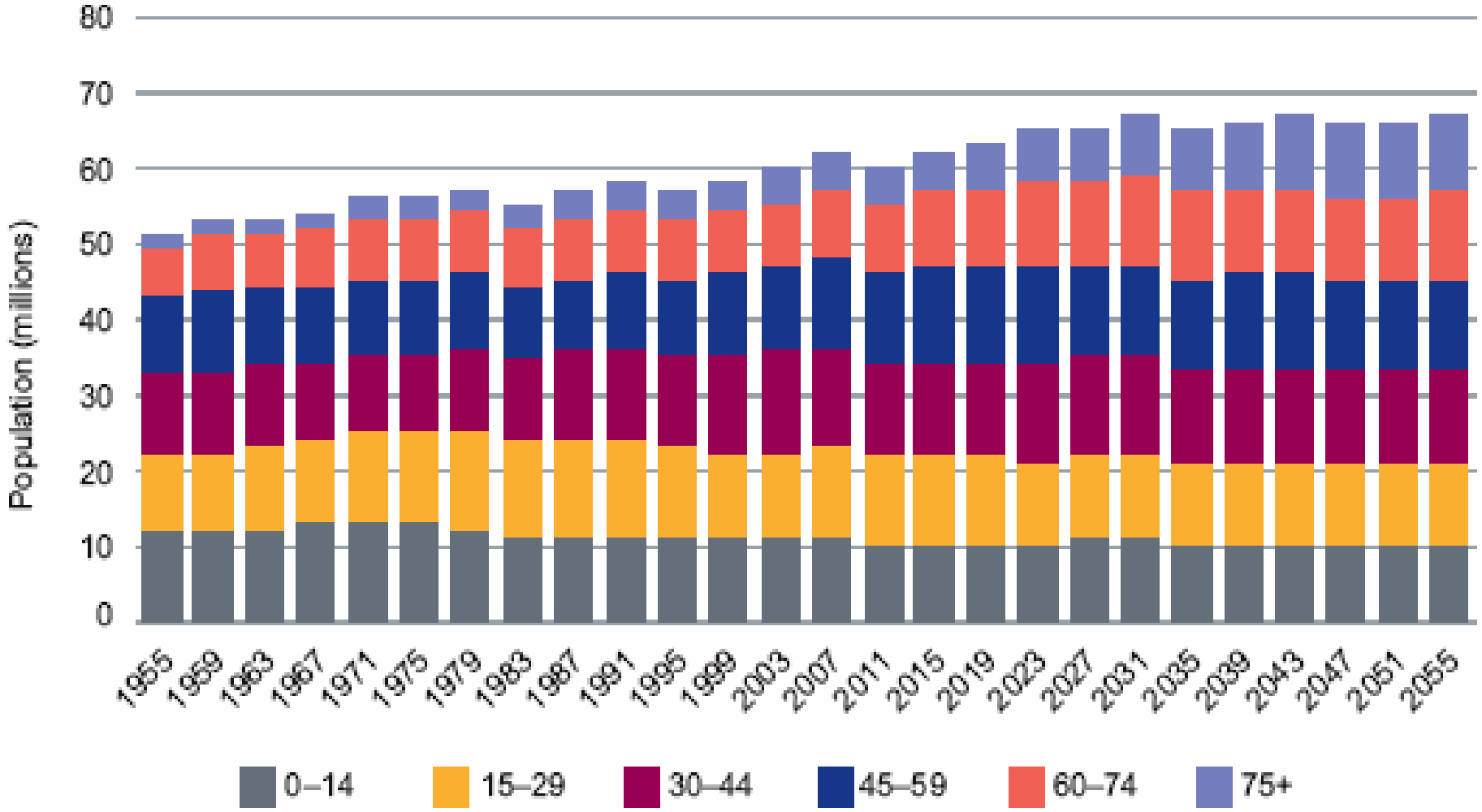
Systems Thinking and Sustainable Development

- Where you work
  - We will take time on your own applying the systems approach to your work
  - pair up and ask question to help clarify your thoughts
  - feedback on your findings

Education is provided to our rising generation at school and in Further Education Colleges free.

So who is the customer?

Population – the rising generation



No leadership, no action

- Challenges
  - Gradgrind of economic sanction.
  - Narrowness of academic discipline
- Sustainability is holistic and is successfully undertaken across 30% of business according to McKinsey.

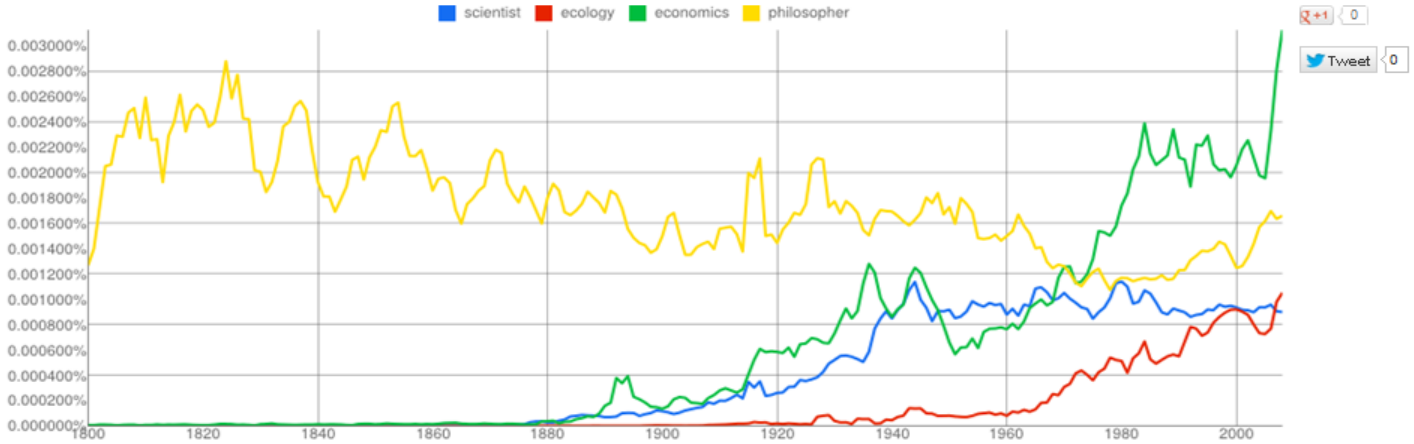
What lecturers say about sustainability

- *'There's no space for more material'*
- *'It's not relevant to my subject'*
- *'I'm interested and think it's important but I don't feel I know enough to handle this area'*
- *'We can't do much as senior management aren't at all supportive'*
- *'There's no demand from employers or professional bodies'*
- *'It sounds too difficult, particularly if it's asking me to engage with new pedagogy or attempt interdisciplinary approaches'.*

(Dawe et al 1995)

Google books Ngram Viewer

Graph these ***case-sensitive*** *comma-separated phrases:* scientist,ecology,economics,philosopher
between 1800 *and* 2008 *from the corpus* British English *with smoothing of* 1 .
Search lots of books



Search in Google Books:

1800 - 1816	1817 - 1831	1832 - 1887	1888 - 1982	1983 - 2008	philosopher (British English)
1800 - 1961	1962 - 1997	1998 - 2000	2001 - 2003	2004 - 2008	ecology (British English)
1800 - 1924	1925 - 1991	1992 - 1997	1998 - 2003	2004 - 2008	economics (British English)
1800 - 1927	1928 - 1981	1982 - 1989	1990 - 1998	1999 - 2008	scientist (British English)

Run your own experiment! Raw data is available for download here.

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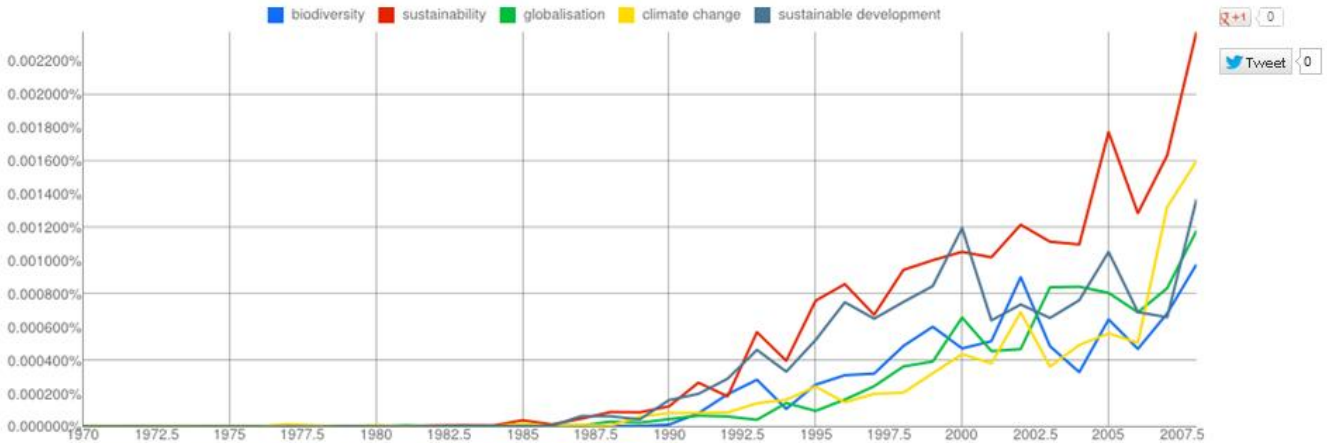

Search in Google Books:

1970 - 1997	1998 - 2005	2006	2007	2008	globalisation (British English)
1970 - 1994	1995 - 2005	2006	2007	2008	sustainability (British English)
1970 - 1993	1994 - 2004	2005	2006 - 2007	2008	sustainable development (British English)
1970 - 1995	1996 - 2004	2005	2006 - 2008	2009 - 2008	biodiversity (British English)
1970 - 1995	1996 - 2006	2007	2008	2009 - 2008	climate change (British English)

Run your own experiment! Raw data is available for download here.

The Zeitgeist

- Inaction
  - because of fear
  - lack of confidence
  - You can understand how things happen during periods of rapid change
  - The natural expedient is to…..block, obfuscate, conceal, obscure, cover-up.

Sustainability Literacy

1. Discipline related knowledge and skills - applied in a sustainability context
2. Sustainability related knowledge and skills
3. Generic skills - *applied in a sustainability context*

Next steps

- Another session in January to see how you have embedded sustainability into your work or not as maybe.