Between a Rock and a Hard Place
Sustainable geoscience

In the UK, the Geological Society's 2017 GEOLOGY of the Year - 'The Geological Society of London' (GSL) - introduced the concept of sustainable geoscience. This initiative aims to promote the integration of sustainable development principles into the practice of geoscience, both in academia and industry. The GSL aims to raise awareness of the importance of sustainable geoscience and to encourage researchers, practitioners, and policymakers to adopt sustainable practices in their work.

To truly appreciate the complexity of contemporary environmental challenges, we need to draw on the social sciences.

Background

The study of the Earth, its history and how it works provides crucial knowledge, experience, and guidance on how to meet many of the major social and environmental challenges of our time. Understanding the Earth's systems and processes is essential for addressing issues such as climate change, natural resource management, and the sustainable development of human societies.

In the UK, the Geological Society's GEOLOGY of the Year initiative aims to promote sustainable geoscience, encouraging researchers, practitioners, and policymakers to adopt sustainable practices in their work.

To truly appreciate the complexity of contemporary environmental challenges, we need to draw on the social sciences.

Conclusion

By integrating sustainable development principles into the practice of geoscience, we can better understand the Earth's systems and processes, and make informed decisions about how to manage our natural resources and address environmental challenges. The integration of sustainable geoscience is crucial for the success of modern societies and the preservation of the planet for future generations.
Problem-driven Knowledge-driven

Motivation

Knowledge-driven

SCIENCE

PUBLIC

Low Public Participation

High

'Make and Sell'

Knowledge-driven

Public Participation

Honest Broker

'Sense and Respond'

Public Consultations

Citizen Juries

Television Science

Museums and Science Centres

Citizen Science

Academic Articles / Conferences

Public Talks

Popular Science Writing

Policy Reports

Public Debates
Mt Merapi INDONESIA
Act 1: Science and the Public
Public Attitudes to Science

- Science Fan: 23%
- Boys & Girls: 23%
- Mr & Mrs Average: 23%
- Too many other concerns: 23%
- I wish I could understand: 8%
- I don’t like science: 14%
- I know all I need to know: 2%
Science creates more problems than it solves.

Science is such a big part of our lives we should all take an interest.

New technologies excite me more than they concern me.

Science tends to benefit the rich more than they benefit the poor.

Technological change happens too fast for me to keep up with it.

We depend too much on science and not enough on faith.

The benefits are greater than any harmful effects.

Science tends to benefit the rich more than they benefit the poor.

We should use more natural ways of farming.

Human activities have a significant impact on the planet.

I believe everything in the world is connected.

Children should be protected at all risks.

People shouldn’t tamper with nature.

People have the right to modify the natural environment to suit their needs.

Not vaccinating children puts others at risk.

Values, beliefs & world views.
<table>
<thead>
<tr>
<th>Values</th>
<th>concerned &amp; disengaged</th>
<th>the risk averse</th>
<th>the cautiously keen</th>
<th>the science fans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest in science</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

- creates more problems than it solves
  - 1 2 3 4 5
- too fast a pace to keep up with
  - 1 2 3 4 5
- people shouldn’t tamper with nature
  - 1 2 3 4 5
- children must be protected at all time
  - 1 2 3 4 5
- very important for Society’s problems
  - 1 2 3 4 5
People seek affirmation of their attitudes, no matter how fringe. They will reject any information that are counter to their attitudes.

When information is complex, people make decisions based on their values and beliefs.

People most trust those whose values mirror their own.

Attitudes that are not formed by logic (nor facts) are not influenced by logical (nor factual arguments).

‘Public concerns about contentious science or technologies are almost never about the science - and scientific information therefore does little to influence these concerns.’
Act II

Communicating Contested Geoscience
“And you keep going down and down until you eventually hit, I take it, very hot rocks and the coal there.

If it’s not from the heat being radiated, it’s from being enclosed, I’m sure it will get hotter.

Decent miners, a lot of miners there, they’re virtually in the nude because it’s so hot.”
“So down towards the very, very bottom of the Earth.

That’s because it’s where it’s all broken down even more and I presume that’s where the heat of the Earth is.”
A “mental models” approach to the communication of subsurface hydrology and hazards

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Communicating contested geoscience to the public: Moving from ‘matters of fact’ to ‘matters of concern’

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ABSTRACT

Geological issues are increasingly intruding on the everyday lives of ordinary people. Whether it is the onshore extraction of oil and gas, the subsurface injection of waters for geothermal power or the deep storage of waste products, communities across the world are being confronted with controversial geological interventions beneath their backyards. Communicating these complex scientific and technical issues is made more challenging by the growing public unfamiliarity with the underlying science. Cognitive studies confirm a natural disinterest at the

Earthquake risk communication as dialogue – insights from a workshop in Istanbul’s urban renewal neighbourhoods

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Act III

Lessons from ‘the Box’
Problem-driven Knowledge-driven

Motivation

Low High

SCIENCE

Public Participation

Policy reports
Public consultations
Citizen juries
Citizen science
Museums and science centres
Television science
Popular Science writing
Public debates
Public talks
Academic Articles / Conferences
Popular Science writing
Public talks
Public consultations
Citizen juries
Television science
Museums and science centres
Citizen science

Honest Broker

'Sense and Respond'

'Make and Sell'

Low

High
IT’S ABOUT THE WONDER
‘It is a fact often overlooked by scientists that most (other) people are mostly interested in other people, and they are mostly not interested in anything else. The fact that scientists are more interested than average in things and ideas ... marks them out as mentally very unusual.’

(Stewart & Nield, 2012)
IT’S ABOUT US
IT’S ABOUT ‘So What?’
IT'S NOT ABOUT FACTS....

.... IT'S ABOUT STORIES
IT’S ABOUT ENGAGING
PURPOSE

a pursuit of an ambitious, clear, enduring and overarching goal which is motivating

Science isn’t enough…

we need better stories
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