Forest Research

The challenge in practice – responses to/through forestry

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Structure

- Context
- Specific challenges around forests and climate change
- Four scales of response
- Particular challenges

Part 1

- Context
- Specific challenges around forests and climate change
- Four scales of response
- Particular challenges

Mitigation policy drivers

- UK Kyoto target – reduce GHG emissions by 12.5% below 1990 levels, by 2008-12
- EU target: 20% of energy from renewable sources by 2020
  - The UK's part in this: 15% (up from 1.5%)
- Climate Change Bill: statutory target of 60% reduction in CO2 emissions by 2050

What are we looking for?

Adaptation: adaptive resource management, coping with floods, coping with temperature extremes in cities … more trees

Mitigation: reduced emissions, greater sequestration … less travel, less oil-dependent transport, less food miles

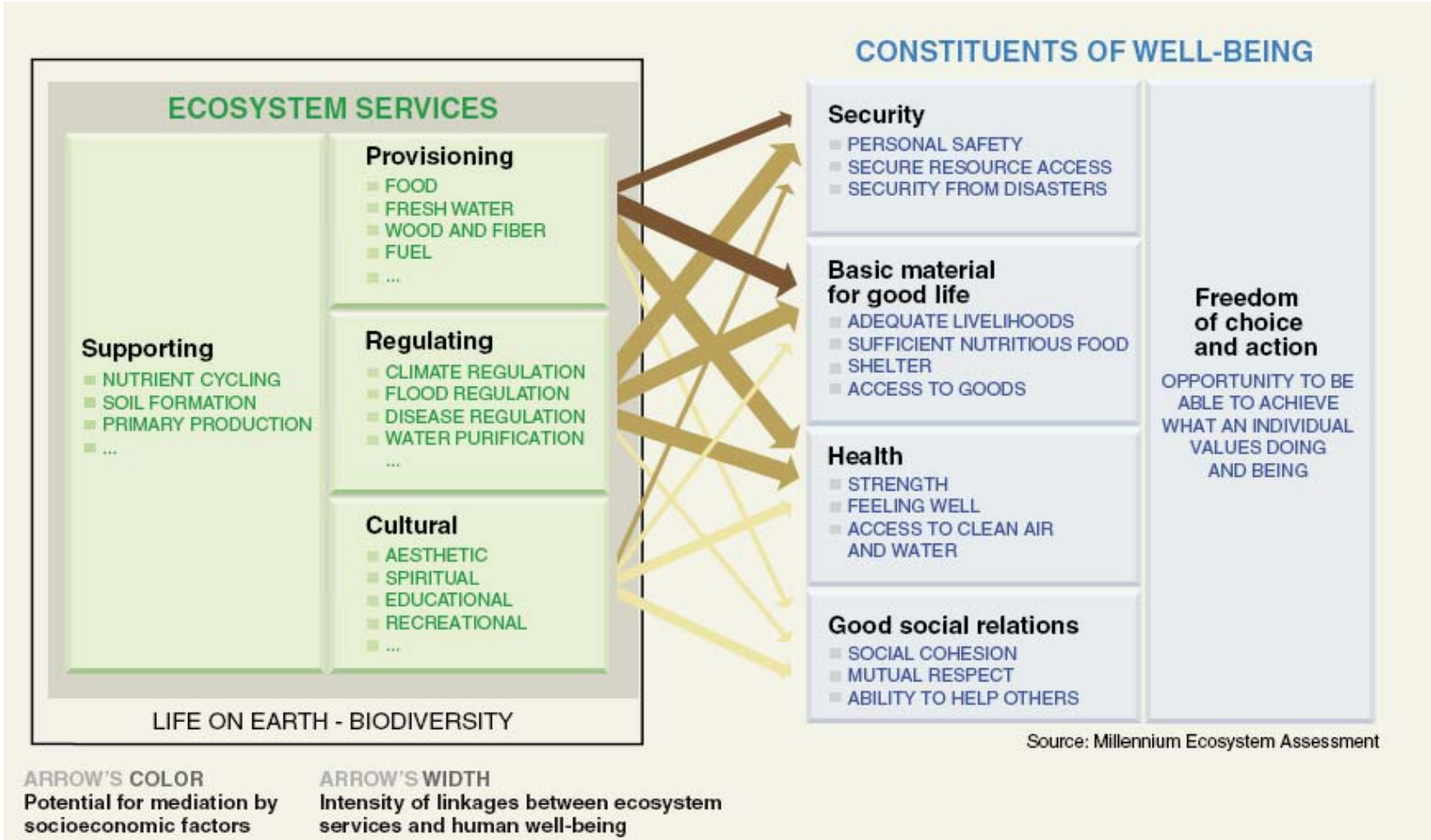
Both require:

- Behavioural change
- More sustainable lifestyle
- More resilient communities

Part 2

- Context
- Specific challenges around forests and climate change
- Four scales of response
- Particular challenges

Ecosystem services



Contextual background

- Only 20% UK consumption of wood and related products is domestically produced
- 12% of UK and 17% of Scotland's land area is wooded – compared with EU average of 35%
- Climate Change may lead to increased growth rates and greater areas of suitability for tree planting in Scotland
- Forest expansion targets have been announced for Scotland, England and Wales

Issues and opportunities

- Mitigation – forests can sequester carbon dioxide and provide long-term storage;
- Mitigation - timber can substitute for other materials such as concrete and steel with higher embedded energy
- Mitigation – wood as a fuel (domestically, industrially) can replace fossil fuels

- Adaptation – new management methods will have to evolve to cope with changing climates
- Impacts - there are considerable uncertainties about impacts of climate change, particularly over indirect impacts such as pests and diseases

Part 3

- Context
- Specific challenges around forests and climate change
- Four scales of response
- Particular challenges

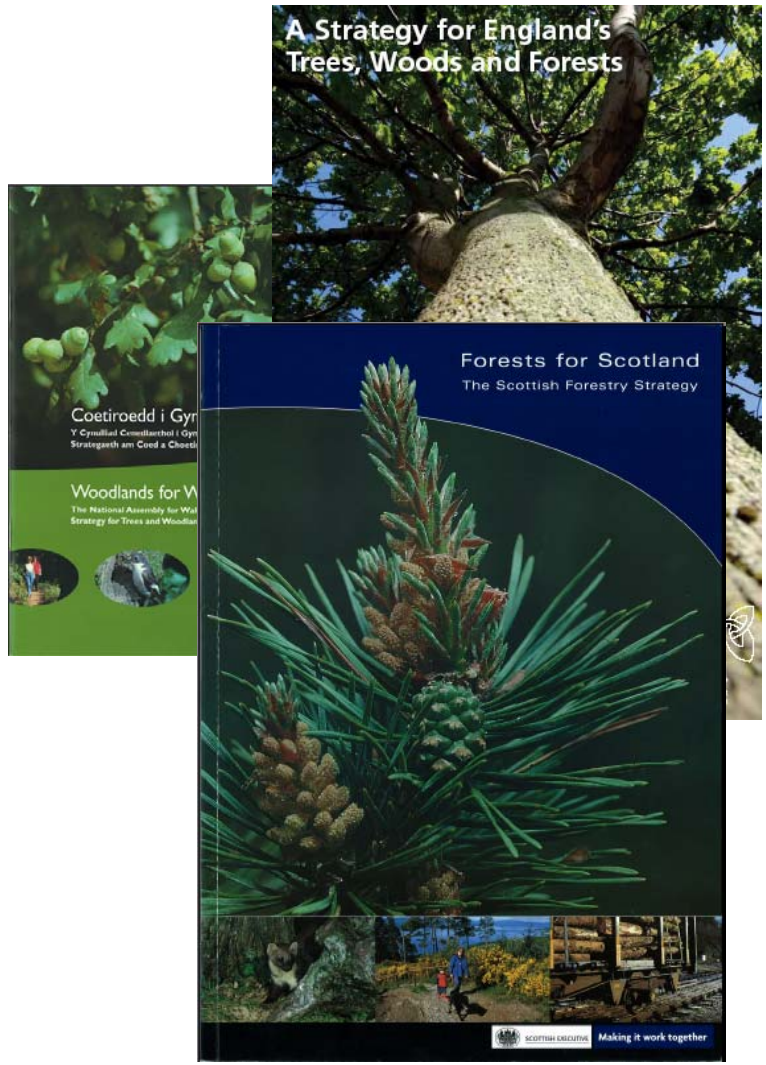
Part 3 a

- Context
- Specific challenges around forests and climate change
- Four scales of response – national strategy
- Particular challenges

Forest policies

Climate change is one of the most serious threats facing the world today. It also creates great **uncertainty** and future generations will need **flexibility** in terms of the type, extent and management of woodlands. We need to facilitate ecological and **management adaptation** to provide those **future options**.

[Scottish Forestry Strategy, 2006]



Forest policies

But climate change only one of a number of strategic goals

Part 3b

- Context
- Specific challenges around forests and climate change
- Four scales of response – public opinion
- Particular challenges

Public Opinion of Forestry 2009

- Good reasons to use public money to support forestry - UK:
  - Renewable energy 50%
  - Tackle climate change 68%
  - Places for wildlife 80%
- Good reasons to use public money to support forestry - Scotland:
  - Renewable energy 21%
  - Tackle climate change 40%
  - Places for wildlife 43%

Public Opinion of Forestry 2009

Woodlands and climate change

- Strongest agreement with the statements - Scotland:
  - 77% - 'Trees are good because they remove carbon dioxide from the atmosphere and store it in wood‘
  - 63% - 'planting more trees can help us cope with climate change by providing more shade and reducing the effects of climate change
  - 52% - 'Scotland could offset all its greenhouse gas emission by planting more trees ‘
- Weakest agreement with the statements - Scotland:
  - 29% - ‘using wood for fuel makes climate change worse because it releases carbon dioxide’

Public Opinion of Forestry 2009

Forest Management

- Strongest agreement with the statements - Scotland:
  - 82% - More information should be provided about the ways in which wood can be used to lessen our impact on the environment
  - 77% - 'A lot more trees should be planted'
  - 69% - 'different types of trees should be planted that will be more suited to future climates'
- Weakest agreement with the statements - Scotland:
  - 9% - 'there is nothing that anyone could do that would make any difference'
  - 8% - 'no action is needed; let nature take its course'
  - 16% - 'trees should not be felled in any circumstances, even if they are replaced'

Public Opinion of Forestry 2009

A lot more trees should be planted 77%:

- **Geography** -
  - North Scotland 94%
  - East Scotland 81%
  - West Scotland 68%

- **Visited woodland** - visited recently 86%; not visited 65%
- **Ethnic group** – member of BME group 63%, not 77%
- **Long term illness/disability** –with long term illness/disability 87%, without 76%

Part 3c

- Context
- Specific challenges around forests and climate change
- Four scales of response - institutional
- Particular challenges

Challenges of climate change

Mitigation

Adaptation

Impacts

The ‘Read report’ available at
http://www.tsoshop.co.uk/bookstore.asp?FO=1159966&Action=Book&ProductID=9780114973513&From=SearchResults

Guidance for managers

- Increased growth rates and changing suitability
- Drought, wind damage, pest and pathogens ecology?
- Colonisation of ‘non-native’ trees

Guidance for end users

BIOMASS Energy Centre

- **Bio-energy development**
- **Specifying timber as construction material**

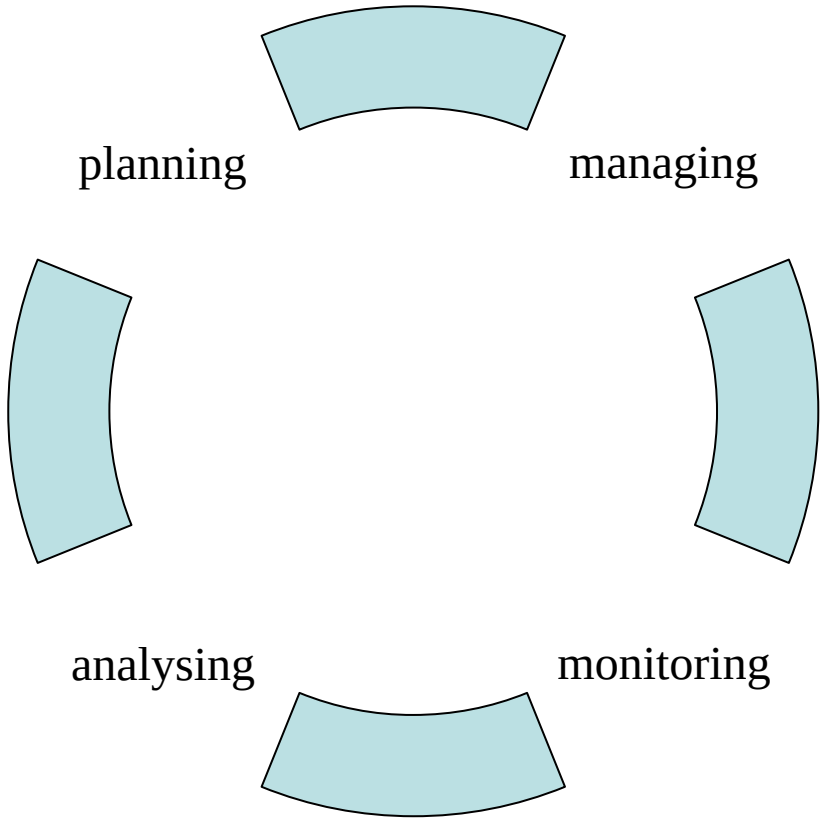
Achieving targets

"*The extent to which the potential for additional emissions abatement through tree planting is realised…will be determined in large part by economic forces and society's attitudes rather than by scientific and technical issues alone*"

Read et al 2009

Adaptive management

- Where complexity and uncertainty require us to treat forest management as an experiment, thereby required enhanced monitoring and feedback to decision making



Engagement

New modes of operation:

- partnership
- fit with fast-changing planning procedures
- engagement with diverse local communities

Part 3d

- Context
- Specific challenges around forests and climate change
- Four scales of response – individual behaviours
- Particular challenges

Understanding changes

"*Trees and forests have a strong role in the way that people make sense of their environment and of how it is changing*"

Read et al 2009

Learning and education

Around 24% of Scottish children visited woodland in the previous 12 months as part of a nursery or school trip. This equates to around 510,000 visits.

Benefits of ‘Forest School’ and ‘Forest Kindergarten’

Community management and volunteering

Effect of woodland experience?

Woodland visitors are more likely than non-visitors to say:

- A lot more trees should be planted
- Different types of trees should be planted more suited to climate change
- More information should be provided about the ways that trees can lessen our impact on the environment

Non visitors are more likely than visitors to say:

- There is nothing that anyone can do that would make any difference [on climate change]
- No action is needed, let nature take its course [on climate change]
- Trees should not be felled in any circumstances, even if they are replaced

Cause or effect? Need longitudinal quantitative and qualitative research to find out

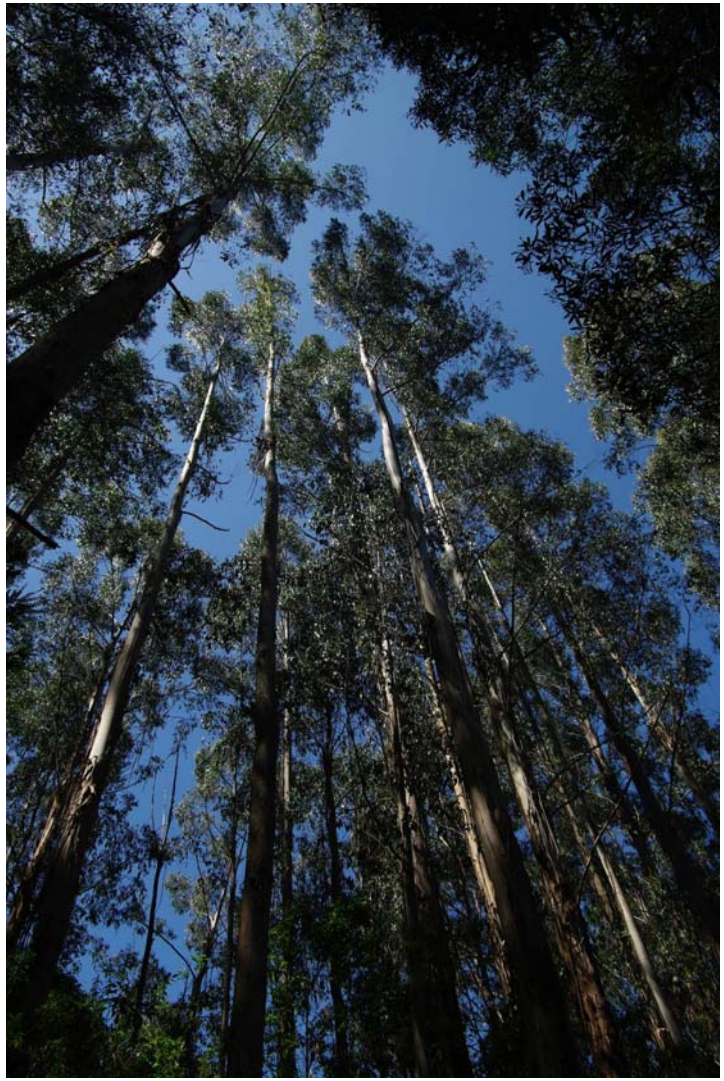
Part 4

- Context
- Specific challenges around forests and climate change
- Four scales of response
- Particular challenges

Trade-offs and synergies

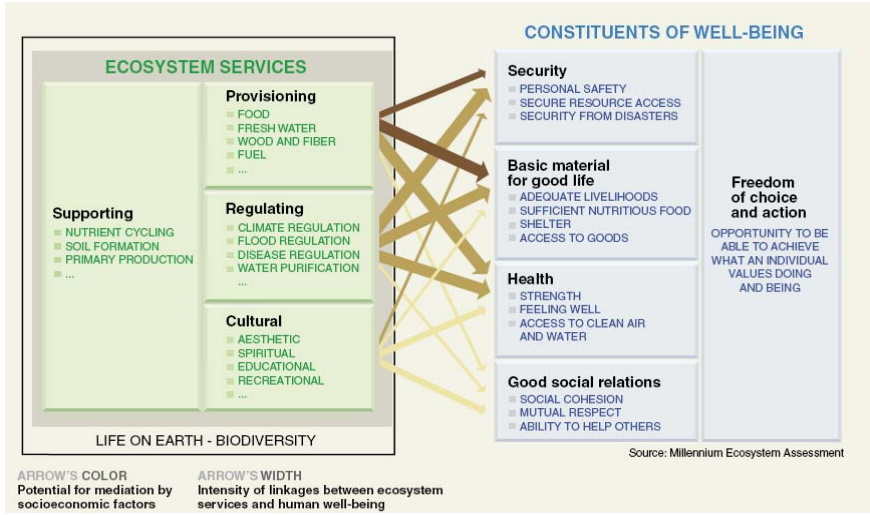
- Cumulative abatement potential (tCO_2 ha^{-1}) by yr 2100
- Fast growing eucalyptus achieve 2546 t
- Slow growing broadleaf farm woodland achieve 498 t

(*Matthews & Broadmeadow 2009*)



The challenges in practice

- Responding to climate change whilst meeting other societal needs
- Valuation of ecosystem services to assess trade-offs and synergies
- The geographic focus for understanding and for action
- Engagement and participation



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- Disclaimer – my responsibility; a researcher's speculation not official policy!