EAWG4: Managing Change: the role of scenarios in decision making

11th March, Victoria Quay.

Engaging policy with Ecosystem Research in Scotland

The Ecosystem Approach to decision making

EAWG4 is an opportunity for Scottish Government policy groups to engage in discussions with the RESAS Strategic Research Programme[1] and others engaged in research relevant to decision making over land-use and the consequences for ecosystem services. The Ecosystem Approach (CBD, 2004) is a concept widely adopted in policy and its application is the focus of strategy documents and research in relation to its utility as a tool for land-use decision making. It is cited in a number of policy areas including Climate Change; National Planning Framework; Scottish Biodiversity Strategy and in particular Scotland's Land Use Strategy (LUS). The LUS has two particularly relevant proposals:

- Proposal 8 "Demonstrate how the ecosystem approach could be taken into account in relevant decisions made by public bodies to deliver wider benefits, and provide practical guidance.
- Proposal 10 "Investigate the relationship between land management changes and ecosystem processes to identify adaptation priorities

The LUS can be described as having five broad policy goals: Sustainable Food Production; Sustainable Water Management; Low Carbon Economy; Halting Biodiversity Loss and Communities better connected to the Land. Achieving all of these recognises the multiple benefits ecosystems provide but also suggests that trade-offs may need to be made in some situations. The Ecosystem Approach (EA) is a mechanism to make those sorts of decisions in a transparent and inclusive manner based on the best evidence to hand and at the appropriate scale.

Researchers in the RESAS Ecosystem Services Theme have developed an "integrated framework" to guide research and application of the EA. In particular to develop tools that help the decision-making processes that affect ecosystem service delivery in the future (See Figure 1 at the end of the document).

Scenario evaluation as a tool in the decision making process.

A key step in the EA framework is the development and evaluation of future scenarios which are a tool to improve understanding of the adaptive capacity of environmental assets to deliver final ecosystem services under a range of pressures and drivers of change (including changes to land use and farming systems).

Using scenario evaluation as a tool to help land use decision making recognises that there is a need for a forward-looking or horizon-scanning component to ensure that actions taken now result in an equitable, prosperous society as well as a sustainable environment that provides multiple benefits. Although scenarios are to a large extent imagined, it is crucial that they are plausible, salient, credible and legitimate in that they describe how various driving forces influence important outcomes along time horizons that range from 10 to 100 years. Traditionally scenarios have been applied within business and organisational management, but their benefits have more recently been recognised within environmental assessments.

Developing a common Approach to Scenarios

In Scotland, researchers are collaborating in order to develop a common approach to Scottish land use change scenarios. This is based around existing work that the different organisations are already undertaking for a range of customers (e.g., CLIMSAVE, UK NEA, and UKCIP). It is increasingly clear that there needs to be consistency across Scottish-based research providers to make their work relevant to the range of government

[1] Eight themes in the Scottish Government's two strategic research programmes Environmental Change and Food and Rural Industries (2011-2016).

departments and agencies, NGOs and others with an interest in managing land use change in the face of the environmental and policy drivers.

Our aim, therefore, is to develop a decision making toolbox to help plan for the future. An important first step in this process is to engage with policy makers to collate and build consensus on the range of environmental and policy drivers that should be considered when making decisions. Collating these drivers is central to developing plausible future storylines or scenarios in order to be able to identify the management actions that they would entail and the trade-offs among ecosystem goods and services that these scenarios would necessitate.

This workshop is the first step in developing an efficient and adaptable decision-making tool that can be used with stakeholders in national, regional or local workshops. Ultimately we aim to be able to explore the implications of change on current decisions as a 'future-proofing' strategy and to be able to assess the viability of future targets or outcomes, including their potential pathways (with associated indicators).

Examples of issues that Scenarios can help inform:

i) Planting new or replacement woodland consistent with the principles of 'the right trees in the right place' (Woodland Expansion Strategy)
ii) Planning new infrastructure, including new sites for renewable energy (National Planning Framework; Renewables Routemap)
iii) Water resources – identifying key risks to meeting water quality objectives (Water Framework Directive SWMI horizon-scanning etc.)
iv) Water resources – balancing changing supply and demand to maintain a healthy resource base (Water Framework directive and HydroNation)
v) Developing appropriate measures to protect against pests, diseases and invasive species (Wildlife & Natural Environment Act)
vi) Flood defence – designing schemes to deliver minimum standards of service (Flood Management Act)
vii) Choosing the right crops and varieties to invest in within a volatile global market
viii) Planning ecological networks (Biodiversity Strategy)
ix) Developing and delivering realistic conservation objectives for priority species and habitats (Biodiversity Strategy)
x) Identifying the best transition pathways to deliver greenhouse gas emissions reductions and a low carbon economy (Climate Change Act)
xi) Cross-sectorial integration of these different objectives as identified by the Land Use Strategy.

Thus scenarios can be used to help address trade-offs resulting from achieving particular policy objectives such as:

- How would woodland expansion as a tool for achieving low carbon economy goals (Climate change policy area) affect the delivery of other LUS goals (water management,)?
- Or how would achieving good ecological status of freshwater systems to achieve WFD policy goals affect achieving other LUS goals (biodiversity enhancement, recreation opportunities, low carbon economy and food security)

Dealing with change:

The workshop will allow us to start to bring together the global level drivers (megatrends) that are shaping the present and future world with more local controllable drivers in Scotland. Depending on the issue, these drivers have varying levels of influence, so this workshop sets out to collate external global drivers with the more governable national, regional or local

factors in order to develop scenarios to address issues relevant across different scales. What makes decision making even more challenging is the increasing recognition that the future may be rather different from the past. Extrapolation of past or current trends into the future or the use of predictive modelling based solely on past trends may therefore provide an inadequate scientific evidence base on which to base policy decisions. Examples of this include:

i. The effects of globalisation, exemplified by the global financial 'crash' of 2009 and consequent decline in economic outputs,
ii. The effects of globalisation, exemplified by rapid fluctuations in commodity prices, particularly related to food and energy
iii. Climate change, increased variability and the increased risk of extreme weather, as experienced in recent years.
iv. Rapid changes in technology and communications
v. Changing social attitudes, including those towards risks and responsibilities

Many of these changes are beyond the control of governments or even international agreements. The implication is that for strategic decision making to be robust in a rapidly-changing world, we need to be prepared for and resilient to a wide range of possible changes. In addition, as the world becomes more connected we need to develop systems-based approaches that can help to better understand the impact of one type of change or decision on another. This in turn can facilitate more joined-up policy responses.

Scenarios justified

Scenarios provide a structured process to identify these possibilities rather than provide forecasts or predictions. They can therefore provide a planning and analytical tool that can be used to both better prepare for future change (from years to decades) and to help develop a vision of what we may aspire to in the future. They can be used to explore the implications of change on current decisions as a 'future-proofing' strategy and to establish the viability of future targets or outcomes, including potential pathways to achieve those outcomes (with associated indicators).

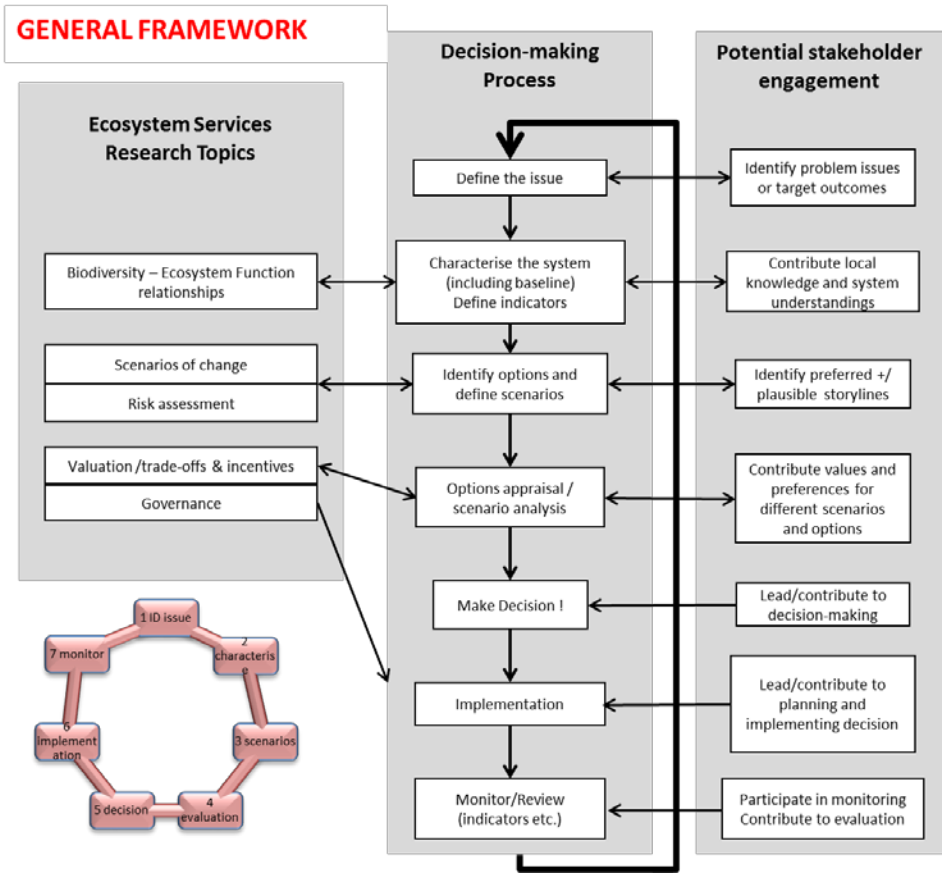

Figure 1. An integrated framework to demonstrate the steps in the ecosystem approach (middle column) and how research (left column) and practice (right column) feeds into the cycle.