Trade-off analysis

Trade-off analysis (multi-criteria scenario testing) is a decision support tool. It can be used to help decision-making where there may be multiple objectives and some uncertainty about the impacts of different forest management strategies. Trade-off analysis will involve a number of steps. Generally it combines stakeholder analysis, conflict assessment and participatory decision-making into a 'multi-criteria analysis'. The main benefits of the tool are that the way in which decisions are reached are made clearer and more transparent, and will include more stakeholders. The tool can therefore build agreement between stakeholders and help to manage any potential conflicts and competing interests. There are three key steps:

1. Stakeholder analysis.
2. Consensus building:
   - identifying scenarios,
   - identifying criteria.
3. Multi-criteria analysis to understand impacts on stakeholders and to decide between scenarios.

Public meetings can be used to identify and then involve stakeholders to build a picture of the different possible management strategies, and the important criteria attached to them. These multiple criteria can then be listed out within each scenario, and the impact of different scenario criteria on key groups can be worked out. The final stages of the process involve stakeholders in agreeing which management scenario is their preferred option, and what the implications of that are on different stakeholder groups.

Resources and requirements

Skills

- Good facilitation and mediation skills are needed.
- Understanding of the local context is also required.

Equipment

- The process can be very sophisticated or very simple. Some forms of multi-criteria analysis use computer software to help in judging and scoring the criteria, others use matrix scoring methods on paper.

Time

- Depending on the methods used the process can last from half a day to a number of weeks.

Level of engagement

INFORMING:

CONSULTING:

INVOLVING: ★★

PARTNERSHIP: ★★★

Strengths

- The process is transparent to those involved.
- The preferred scenario (outcome) is mutually agreed by participants.

Weaknesses

- It can be complicated and time consuming.
- It may require conflict management skills where conflicting groups are brought into contact with one another.

Costs

- Staff time.
- Venue.
- Computer modelling software.

Useful sources of information

Case studies

- Using multi-criteria analysis and visualisation for sustainable forest management planning with stakeholder groups. S.R.J. Sheppard and M. Mietner (2005). Forest Ecology and Management, **27(1–2)**, 171–187.
- Examples of using trade-off analysis in natural resource management in a selection of countries, supplied by Research into Use project: www.researchintouse.com/nrk/RIUinfo/PF/NRSP08.htm
- Trade-off analysis for coral reef management: www.coremap.or.id/downloads/ICRS9th-Tompkins.pdf
- Addressing trade-offs in forest landscape restoration. K. Brown (2005). Forest restoration in landscapes, Part A, 59–64. Springerlink: www.springerlink.com/content/ng2583521527x766

Journal article

- Trade-off analysis for marine protected area management. K. Brown, W.N. Adger, E. Tompkins, P. Bacon, D. Shim and K. Young (2001). Ecological Economics **37**, 417–434. www.uea.ac.uk/menu/acad_depts/env/people/adgerwn/tradeoff.pdf

Web

- International Association for Public Participation's database of tools and techniques includes some that can be used in multi-criteria analysis: www.iap2.org

Example of a criteria and scenario table used in building stakeholder consensus and scenario choice.

Criteria	Scenario			
	A	B	C	D
Economic				
Increased revenue (£1000/ha)	9	11	17	19
Visitor enjoyment (£/ha)	1.80	2.75	0.50	1.60
Social				
Local employment (no. jobs)	2	2	6	6
Level of wellbeing (score 2 = low, 6 = high)	5	4	3	2
Level of access (score 3 = low, 9 = high)	5	4	5	7
Environmental				
Woodland quality (score 2 = low, 6 = high)	2	4	4	6
Level of biodiversity (score 3 = low, 9 = high)	3	6	3	3
Water quality (µgN/litre)	1.3	1.2	3.0	1.8

Adapted after Brown et al. (2001).

This toolbox is designed to assist Forestry Commission staff when they are considering which tools they could use to involve the public in the forest and woodland planning process. For more information please visit the website at: www.forestry.gov.uk/toolbox

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