Multicriteria Analysis (MCA)

Description	MCA describes any structured approach used to determine overall preferences among alternative options, where the options accomplish several objectives. In MCA, desirable objectives are specified and corresponding attributes or indicators are identified. The actual measurement of indicators need not be in monetary terms, but are often based on the quantitative analysis (through scoring, ranking and weighting) of a wide range of qualitative impact categories and criteria. Different environmental and social indicators may be developed side by side with economic costs and benefits. Explicit recognition is given to the fact that a variety of both monetary and nonmonetary objectives may influence policy decisions. MCA provides techniques for comparing and ranking different outcomes, even though a variety of indictors are used. MCA includes a range of related techniques, some of which follow this entry.
Appropriate Use	Multicriteria analysis or multiobjective decision making is a type of decision analysis tool that is particularly applicable to cases where a single-criterion approach (such as cost-benefit analysis) falls short, especially where significant environmental and social impacts cannot be assigned monetary values. MCA allows decision makers to include a full range of social, environmental, technical, economic, and financial criteria.
Scope	All regions, all sectors.
Key Output	A single most preferred option, ranked options, short list of options for further appraisal, or characterization of acceptable or unacceptable possibilities.
Key Input	Criteria of evaluation as well as relevant metrics for those criteria.
Ease of Use	Depends on the particular MCA tool employed. All rely on the exercise of some expert judgment.
Training Required	Choice and application of appropriate MCA technique require some expertise, but can be acquired fairly easily.
Training Available	The United Kingdom Department for Transport Local Government and the Regions (see Documentation) provides nontechnical descriptions of MCA techniques, potential areas of application, and criteria for choosing between different techniques, and sets out the stages involved in carrying out MCA.
Computer Requirements	Personal computer.
Documentation	DEFRA. 2003. *Use of multi-criteria analysis in air quality policy: A Report* (http://www.defra.gov.uk/environment/airquality/mcda/index.htm). DTLR. 2001. *Multi Criteria Analysis: A Manual.* The internet version is now available at http://www.dtlr.gov.uk/about/multicriteria/index.htm. ETR. 1999. *Review of Technical Guidance on Environmental Appraisal:* A Report by Economics for the Environment Consultancy (http://www.defra.gov.uk/environment/economics/rtgea/8.htm).
Applications	World Commission on Dams. Integrated Decision Making Framework. (http://www.dams.org/report/contents.htm). World Conservation Union Office for West Africa. Sustainable Development Planning Process (http://www.iucn.org/themes/wetlands/). Tyndall Center for Climate Change Research. Framework for Carbon Mitigation Projects (http://www.tyndall.ac.uk/publications/working_papers/wp29.pdf).

Multicriteria Analysis (MCA) (cont.)

Contacts for Framework, Documentation, Technical Assistance	For general information and contact information for sources of assistance for particular tools: Stratus Consulting, P.O. Box 4059, Boulder CO 80306; Tel: +1.303.381.8000; Fax: 303.381.8200; e-mail: jsmith@stratusconsulting.com.
Cost	Depends on particular MCA tool applied, but in general is inexpensive.
References	Hamalainen, R.P. and R. Karjalainen. 1992. Decision support for risk analysis in energy policy. *European Journal of Operational Research* 56:172-183. Jones, M., C. Hope, and R. Hughes. 1990. A multi-attribute value model for the study of UK energy policy. *Journal of the Operational Research Society* 41:919-929. Pearman, A.D., P.J. Mackie, A.D. May, and D. Simon. 1989. The use of multi-criteria techniques to rank highway investment proposals. In *Improving Decision Making in Organisations,* A.G. Lockett and G. Islei (eds.). Springer Verlag, Berlin, pp. 158-165.