

Uncertainty and Risk Analysis

Description	This approach can be applied through critical review of available literature and data or through data analysis using software programs. Uncertainty and risk analysis allows the user to address the errors and unknowns often associated with data and information used to evaluate climate change adaptation measures. A key element of uncertainty and risk analysis is defining the decision criterion that is most appropriate for the question at hand. Uncertainty and risk can be assessed qualitatively, using probability ratings such as slight, moderate, and high. Uncertainty can also be assessed quantitatively, using decision analysis tools (e.g., decision trees) or sensitivity analyses such as Monte Carlo analysis. This method is often used in conjunction with other assessment techniques.
Appropriate Use	This tool is an important step in any assessment of climate change adaptation measures. Quantitative analyses using decision theory or simulation techniques are most useful when evaluating the data used for benefit-cost or similar quantitative analyses.
Scope	All locations; all sectors; national or site-specific.
Key Output	Depending on the method used, a quantitative or qualitative estimate of the uncertainty or risk associated with data being used to evaluate an adaptation measure.
Key Input	Information and data used for other analyses of an adaptation measure.
Ease of Use	Relatively easy to apply.
Training Required	Requires an understanding of the policy objectives and adaptation measures being considered. Monte Carlo and other quantitative analyses require training in specific techniques and uses of statistical software.
Training Available	Contact Stratus Consulting for more information (see below).
Computer Requirements	IBM-compatible 286; Lotus 1-2-3 or Excel spreadsheet software; @Risk, Crystal Ball software applications.
Documentation	U.S. EPA. draft. Guidelines for Preparing Economic Analyses. U.S. Environmental Protection Agency, Washington, DC.
Applications	Used to help determine total programmatic effectiveness of the Global Environment Facility (GEF).
Contacts for Tools, Documentation, Technical Assistance	Joel Smith, Stratus Consulting, P.O. Box 4059, Boulder, CO 80306 USA; Tel: +1.303.381.8000; Fax: +1.303.381.8200; e-mail: jsmith@stratusconsulting.com ; website: http://www.stratusconsulting.com/ .
Cost	Documentation is free. Cost of analysis varies depending on type of analysis used; quantitative analyses are more time consuming and costly.
References	Brklacich, M. and B. Smit. 1992. Implications of changes in climatic averages and variability on food production opportunities in Ontario, Canada. <i>Climatic Change</i> 20:1-21.