

Committee on Trade and Environment

METHODOLOGIES FOR ENVIRONMENTAL VALUATION:
A SELECTED BIBLIOGRAPHY

Note by the Secretariat

1. This Note has been prepared in response to a request from Members of the Committee on Trade and Environment for the Secretariat to prepare a bibliography of references which deal with issues related to environmental valuation.¹ The following provides an introduction to some of the issues which are addressed in the references contained in the bibliography.
2. A number of tools have been developed to value the benefit of environmental improvements, or to value the damage caused by environmental degradation. One of the techniques which has been used to value the environment is cost/benefit analysis. This technique of environmental valuation is used, for example, to determine the viability of environmental management policies. In this respect, experience has illustrated that it is difficult to quantify with any precision many of the variables that should be included in a calculation of environmental costs and benefits, given that many environmental goods and services are not exchanged in the market place and therefore are not assigned a market value.
3. Environmental valuation was initially used to calculate liability, such as the cost of cleaning-up environmental accidents, and compensating environmental damage. The welfare of society can be undermined when market prices fail to capture the effects of environmentally-damaging activities and therefore send misleading signals concerning the optimal use of environmental goods and services. Environmental valuation has also been used to incorporate environmental costs and benefits in systems of national accounting; to measure environmental benefits associated with trade liberalisation; and to determine an appropriate rate of environmental taxes or charges.
4. Various environmental valuation techniques have emerged in recent years. Work has been carried out in academic research institutes and intergovernmental foras, such as the UNCTAD Intergovernmental Group of Experts on Standards of Accounting and Reporting, the World Bank and UNEP. In addition to the on-going work on natural resource accounting, an extensive body of literature in the field of environmental economics continues to be developed on valuation methodologies. The attached bibliography contains references to a number of contributions in this field.
5. Environmental valuation has concentrated on two areas: (a) quantifying damages arising from environmental degradation. This includes defensive expenditures which encompass pollution abatement costs and the costs of treating hazardous or toxic wastes. Defensive expenditures also include the environmental costs related to changes in ecosystem functions, such as with respect to wildlife habitats,

¹References to environmental valuation are contained in the Secretariat's sectoral analysis of the environmental benefits of removing trade restrictions and distortions (WT/CTE/W/67).

biodiversity loss and soil or air quality; and (b) quantifying the extent to which different environmental functions contribute directly and indirectly to conventional calculations of economic wealth.²

6. The value derived from environmental resources can be classified into use value which is created by the current use of environmental resources either directly or indirectly, and non-use value which is created by the desire to ensure that an environmental resource will continue to be provided in the future. The literature examines, for example, the benefits associated with establishing economic values for biodiversity, wetlands, forests, wildlife, water and air quality, and various other environmental goods and services which are public or collective goods.

7. Environmental valuation techniques undertake the complex task of identifying environmental benefits and damages and then assigning a monetary value to them. In this context, it is important to emphasize that most environmental valuation techniques do not attempt to quantify the full or intrinsic value of the environment, *per se*, but endeavour to measure public preferences or willingness-to-pay for changes in environmental quality. Cost effectiveness and impact analysis are also used to identify and quantify the impacts of particular policies on the environment.

8. Different methods of environmental valuation have been shown to have different strengths and weaknesses. For example, contingent valuation is an approach to environmental valuation which is based on an analysis of detailed surveys and questionnaires that measure public willingness-to-pay for an environmental good or service (e.g. for municipal water, parks and recreational areas, biodiversity conservation). Surveys attempt to measure the use and non-use value of environmental goods and services. Among the concerns raised about such an approach is that the design of survey questions may be biased. Other valuation techniques which are described in the literature include damage function valuation, household production function valuation and hedonic pricing methods.

²For example, although wetlands tend to be undervalued using conventional economic calculations, one study has estimated the economic returns from clearing wetlands for other uses to be US\$29 per hectare of land, while the indirect use value from protecting the wetland was in the range of US\$167 per hectare. See E. Barbier, et. al., (1993).

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